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Cancer and Work in Canada with particular reference to occupational risk factors in breast cancer patients in one community and related selected research methods used to investigate those factors.

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CHAPTER 10: EVALUATION

10.1 Introduction

The chapter critically examines the research findings, and the extent to which the research questions posed in the thesis were answered. These relate firstly to an assessment of the dominant medical/scientific view of cancer causation, particularly the contribution of occupation to cancer, and how and why this has affected public health policy and practice in Canada. They relate secondly to an exploration of recognised alternative views on cancer causation that acknowledge the role of exogenous risk factors, such as exposures to toxic substances, in cancer causation. They relate thirdly to how an assessment of a community based occupational history data collection initiative can contribute to advancing our scientific understanding of associations between work and cancer, in general and work and breast cancer in particular. More specifically, the thesis sought to find out if data derived from an occupational history questionnaire could provide insight into the potential association between breast cancer risk and farming.

The research process that evolved from the initial CROME stage through to the LOHR case control study and now to the new LOEHR research are also critically examined. The evaluation is intended to offer a view of the bigger occupational health picture linked to the research aims and objectives of the thesis. The findings are discussed in terms of their generalisability in different geographical, occupational and industrial settings within Canada and beyond.

In addition to examining the scientific aspects of the research, the impact on cancer policy and practice will also be highlighted. Its relevance to the work of women's

organisations, trade unions, medical and scientific professionals is discussed as this endeavour was the primary motivation for the research initiative.

The lessons arising from this collaborative research undertaking are critically examined. The particular strengths that exist within the Windsor community are assessed. The scientific and policy-related limitations of the CROME-LOHR process are then summarised.

10.2 Addressing research questions on science, policy and practice

Earlier chapters shed light on the research questions related to science, policy and practice. They revealed that occupational cancer research is politically influenced, thereby negatively affecting breast cancer prevention policies. The scientific debate about cancer causality was influenced by the views of Hueper and Carson, then circumscribed by the much narrower Doll-Peto school of thought and then widened by the Epstein perspectives which once again brought occupation and environment into the cancer causation and 'cancer epidemic' arena. The dominant view of cancer causality and cancer epidemiology in Canada, however, remains as Doll and Peto espoused it.

The lifestyle argument and related campaigns have not won the war on cancer. While there is some improvement in survivability with certain cancers, this general approach has not succeeded in reducing the overall incidence of cancer, nor has it produced a marked reduction in overall cancer mortality (see Chapter 3 for broader discussion of this issue).

10.2.1 Review of literature shows science is influenced by politics

Political and economic interests have circumscribed the scientific literature and reinforced the lifestyle perspective towards cancer aetiology in spite of mounting evidence to the contrary. The rise of the incidence of cancer in the second half of the twentieth century lends credence to the analysis of Epstein and others who suggest exogenous exposures are a significant contributor to this multifactoral disease.

The occupational and environmental causation hypothesis has relevance to breast cancer since the majority of cases occur among women who do not exhibit known or suspected risk factors. While diet, alcohol and to a much lesser extent, tobacco, currently appear to increase risk, particularly if women's age and menstrual status are taken into account, few researchers would identify them as the primary exogenous risk factors for breast cancer aetiology. The emerging theory on the role of xenoestrogenic substances offers a more complete theoretical context to the evaluation of the role of endocrine disruption in increased susceptibility to hormonally mediated cancers, and provides a more comprehensive explanation for the continuing rise in breast cancer incidence. The new insight into the significance of life cycle timing of exposure and the almost counterintuitive impact of low versus high dosages further strengthens the proposition regarding the possible causal relationship between synthetic chemicals and breast cancer risk. Thus, the critical review of breast cancer aetiology lends greater weight to the views of Dr. Epstein and others on the underlying reasons that industrial countries are losing the war against cancer (Epstein, 1998a).

This critical review also had particular relevance to the issue of occupationally related cancer in general. Doll's challenge was to collect the work histories of cancer patients in order to accurately ascertain the contribution of work exposures to overall cancer incidence.

On present knowledge, therefore, it is impossible to make any precise estimate of the proportion of the cancers of today that are attributable to hazards at work (let alone how many future cancers may arise for past occupational exposure during the years before 1980), and none of the estimates that have been made are claimed to be anything more than informed guesses (Doll and Peto, 1981, p.1239).

His challenge has, until now, never been met. Not a single American state cancer registry, in spite of the provision of Congressional monies to collect occupational histories, has undertaken such an effort (Infante, 1995). Nor do Canadian cancer registries include occupational history data. Such data could help shed light onto the real impact of work on cancer causality. The adoption of occupational history data collection on a system-wide basis would require a different scientific and political perspective on the part of cancer agencies.

Industrial workers, despite their known exposures to carcinogens at work, remain almost invisible to cancer agencies. Social class, as a factor, is unacknowledged in Canada by the dominant cancer agencies. The particular risk factors associated with cancer are commonly presented as if everyone in society makes lifestyle choices equally and without social and structural pressures (Tomatis and Huff, 2001).

10.2.1.1 Case studies social class hypothesis

The case studies add support to the hypothesis that social class helps to shape individual choices. It reveals that women employed in agriculture were not consulted about the chemicals they were expected to use. They were not informed about any health risks possibly associated with such work. In order to make a living they unknowingly assumed risks. This is the condition that working class people generally confront. Cancer agencies seem to be unaware that workers are not generally able to choose their working and living environments as the more affluent can.

The social class bias of cancer agencies extends into more aggressive opposition to scientists like Epstein who challenge conventional cancer prevention strategies as inadequate and wrongly focused. Popular groups such as trade unions and women's health movements, on the other hand, are demanding greater attention towards addressing some of the systemic causes of cancer, such as the tolerance of the rights of industries to manufacture products, and generate pollution, and create occupational exposures that ignore the rights of the ordinary person to a safe and healthy society.

Workers, however, have little political power to shape their work environments in such a way as to meet their needs for safe and meaningful work. Canadian cancer agencies and provincial Worker Compensation Boards underestimate and underreport occupationally related cancer while assigning few resources to either primary prevention related to occupational exposures or to research into work-related causes (Shannon and Lowe, 2002; Ontario Federation of Labour, 1999b).

10.2.1.2 Case studies support criticism of the dominant theories of cancer causality

The Windsor research findings affirm the perspective that occupationally related cancer continues to go undocumented and unrecognised. Women employed in agriculture were not recognised as having any particular cancer risk. The CROME and LOHR research studies demonstrated that there might be an explanation for their breast cancers other than family history or misfortune. By documenting their occupational histories, another possible influence on disease aetiology is available and the dominant views of the cancer agencies about the cancer aetiology are challenged if not modified. Such findings also question the automatic rights of employers to offload the costs of cancer treatment onto society as a whole. Acceptance of the work relatedness of some breast cancers would transfer associated costs through workers compensation board premiums back to the industries deliberately or accidentally producing and/or selling carcinogens. The current policies and practices that protect industry from economic responsibility reduce public and worker pressure for amelioration of working conditions and for greater regulatory control to ensure protection.

An alternative view of cancer causality would include an understanding of and greater emphasis on cancer as a multifactoral disease. The literature suggests that the process of carcinogenesis goes through a maturation process from initiation, to promotion, to progression. It follows, therefore, that elimination of risk factors along this continuum could substantially reduce the overall incidence. An approach to cancer prevention that recognises the influence of class and acknowledges the knowledge and experience of workers would evoke new scientific paradigms that would connect the vital role of the populations at risk in identifying and formulating

coherent practices to reduce exposures to carcinogens, in partnership with researchers. Furthermore, social policy would be based on the Precautionary Principle in the face of scientific uncertainty.

Thus, the review of the scientific literature, recognising the insights of Epstein and others, informed the decision of a group of Windsor public health advocates and trade union health and safety activists to develop a research strategy to collect the occupational histories of cancer patients in order to better address the issue of cancer causality. It would serve to test ideas and suspicions that many of the activists had gleaned from their own experience in the workplace. They viewed suspected and known carcinogens at work as deleterious to their health and believed that workers were developing cancer due to these exposures. By examining the work histories of cancer patients they sought to produce evidence that might lead to pressure for changes in the work environment.

10.3 How the case studies address the conflict

Table 10.1 has been prepared to demonstrate some of the key components of the scientific conflict between Doll – Peto versus Epstein and ways in which the Windsor occupational data collection of cancer patients attempted to resolve this controversy through the use of a questionnaire that captured many of the potential cancer risk factors, including occupational ones.

Table 10.1: Case studies' response to contrasting perspectives on causality			
Perspective	Doll-Peto and the <i>Causes of Cancer</i> (1981)	Epstein and the <i>Politics of Cancer</i> (1979, 1998)	Relevance to design of the questionnaire and overall research approach
Causes	Lifestyle	Occupational and environmental contaminants	Inclusion of additional plausible putative factors
Trends in Cancer Incidence	Stable or Decreasing	Increasing, epidemic	Promotion of wide spread adoption of community-based occupational history registries
Analytical Assumptions	Exclusion of elderly, African Americans, and unproven occupational cancer sites and substances. Inclusion of tobacco	Inclusion of elderly, separate data analysis by race, consideration of all cancers potentially associated with occupational and environmental exposures. Inclusion of tobacco as synergist	Questions of age, race, sex, socio-economics. Consideration of all cancer sites (<i>CROME</i> only) and all substances. Includes analysis of multiple factors
Exposure	Voluntary, "Blame the Victim"	Involuntary as well as voluntary	Questions on voluntary and involuntary exposures
Focus	Treatment and cure	Primary prevention	Identification of causative factors for purposes of primary prevention
Research Strategy - Major Tools	Epidemiology (mortality), genetics	Toxicology, animal bioassays, epidemiology (incidence), community knowledge	Epidemiology and community-based action research
Basis of Decision Making	Risk assessment – cost benefit analysis	Preponderance of evidence, Precautionary Principle	Ownership and empowerment regarding prevention
Intervention Premise	Public health and common sense	Political	Community-researcher collaboration can influence policy
Intervention Strategy	Curtail tobacco exposure, individual choices	Regulatory control, product substitution, elimination of carcinogens	Elimination of occupational exposure to carcinogens
Adherents, Interests and Communities	Power elites, cancer establishment and industry	Public health advocates, trade unions, environmental and women's health movements	Public health advocates, trade unions, environmental and women's health movements

Source: Brophy, 2004.

Table 10.1 illustrates how the differing perspectives were synthesised initially into the *CROME* registry and then further refined into the *LOHR* and *LOEHR* case-control study questionnaire and overall approach of community collaboration. Consideration of aspects of both lifestyle and exogenous risk factors allows for a more complete understanding of cancer causality. A further refinement was consciously brought into the research process, that is, including the involvement of the populations at risk into the design and promotion of the undertaking. The new *LOEHR* study, for example, involves women in a consultation process to develop exposure profiles of different occupations during different time periods. This consultative approach will, not only shed light on the conditions of work, but also provide the populations at risk with a more direct connection to the issue of breast cancer causality and work.

Though the Doll - Peto and Epstein debate identified risk factors for cancer that need to be further researched. These and other risk factors were considered in the design of the case studies as shown in *Table 10.2*.

A range of lifestyle and occupational risk factors, such as diet, hormone use and shift work, were incorporated into the examination of the multiple influences on cancer causality. The new understanding of the potential role of hormonally mediated substances, linked to timing of exposures, is a feature of the new *LOEHR* questionnaire.

Table 10.2: Other cancer risk factors, their proponents and relevance to design of the case studies		
Cancer risk factor	Proponent	Relevance to design of case studies
Tobacco Synergism	Tomatis, Davis	Questions on tobacco smoking and exposures to other plausible putative factors
Diet (Saturated Fats and Omega- 3 Fatty Acids, Pesticides, Hormones and other Contaminants),	Epstein, Trichopoulos Davis and Muir, Tomatis	Questions on diet
Shift work	Hansen, Schernhammer, Epstein	Questions on hours of work
Oral Contraceptives	Colborn, Davis, Health Canada, Epstein	Questions on history of oral contraceptive use
Alcohol Consumption	Goldberg	Questions about alcohol consumption
Physical Activity	Health Canada	Questions on physical activity
Social Class	Infante, Tomatis	Questions about income and occupation
Endocrine Disruptors (Breast Cancer)	Colborn, Davis	Inclusion of questions on place of conception and birth, and parents' occupations, age of puberty, parity, menopausal status
Prepared by Brophy, 2004.		

10.4 Addressing the research questions - the case studies

The case studies are evaluated in terms of their response to the scientific conflict.

The collection of lifetime histories of cancer patients in the Windsor case studies challenge the prevailing cancer perspective, which tends to disregard or negate the impact of toxic substances in the workplace and in the general environment.

Each of the three studies, CROME and LOHR, which are completed and LOEHR, which is in progress, has helped to increase scientific and public awareness of the importance of collecting occupational histories (Ontario Federation of Labour, 2000c). The completed studies, CROME and LOHR, have successfully

demonstrated that the collection of occupational histories can identify possible work-related risks for cancer. They have also helped to bring to light the possible breast cancer risk faced by women engaged in agriculture.

The combination of the CROME and LOHR studies addresses the question - Can data derived from an occupational history questionnaire provide insight into the potential association between breast cancer risk and farming? The answer is yes. The findings that arose out of CROME regarding the association between breast cancer risk and occupation, identified increased risk among women 55 years of age or younger who ever farmed. The LOHR findings of elevated breast cancer among women who ever farmed support the CROME results (Brophy et al., 2004a). The LOHR funding sources accepted the research findings of the LOHR project (Workplace Safety and Insurance Board, 2003) and a submission to a scientific journal is in preparation (Brophy et al., 2004).

Further building on the scientific impact of the Windsor research initiative, additional funding was acquired to continue studying breast cancer risk and occupation. New grant money was obtained in 2003 for a new, methodologically improved case control study – Lifetime Occupational and Environmental History Record (LOEHR) (Brophy et al., 2004a, 2003a, 2003b).

The new LOEHR undertaking addresses some of the weaknesses in the LOHR design. Notable refinements include the prioritisation of a more definitive method to assess exposure and the addition of the collection of information on parental and prenatal exposures. LOEHR builds on the CROME and LOHR experiences.

Table 10.3 illustrates the evolution of the research design. CROME began by devising a method of collecting the occupational histories of cancer patients. In addition, age and social class (education and income level) were also controlled for. Much data regarding other aspects of the patient's medical and life history, which were maintained in the Windsor Regional Cancer Centre's own database, were missing and thus limited the CROME analysis. To correct this data problem in the ensuing study, the LOHR questionnaire was designed to capture directly, through the interviewer-administered process, information on known or suspected breast cancer risk factors as well as information about occupational history. The LOHR study revealed that most breast cancer patients and community controls did not recall specific exposures they might have encountered in the course of their work lives. Given that the exposures of greatest interest due to the long latency of cancer, occurred 20 to 30 years previous, it is not surprising that subjects were unaware of such information. In the 1960s through 1980s most workers were told very little about substances used in the workplace. It was not until 1988 that Canadian legislation demanded that products be properly labelled, that Material Data Safety Sheets (MSDS) be made available to workers, and that training on procedures be implemented (Canadian Centre for Occupational Health and Safety, 2003). Many of the women who were employed in agriculture were quite young when living and working in the farming environment and had little access to specific information about the products being used.

Table 10.3: Comparison of the three research questionnaires			
	CROME	LOHR	LOEHR
Age	√	√	√
Age of menarche, menopause		√	√
Alcohol consumption		√	√
Body mass index (BMI)		√	√
Diet			√
Environmental exposures			√
Family history of cancer		√	√
Hobbies			√
Hormone replacement therapy		√	√
Household exposures			√
Occupational exposures		limited	detailed
Miscellaneous exposures (e.g. asbestos, pesticides, x-rays, etc.)			√
Occupational history	√	√	√
Oral contraceptives		√	√
Parental occupations			√
Physical activity			√
Prenatal exposures			√
Reproductive history		√	√
Residential history		limited	√
Sample size	Limited	limited	√
Social class	√	√	√
Smoking history	Limited	√	√

Prepared by J Brophy.

From an epidemiologic perspective there are numerous limitations to the research methodology that each new study attempted to address. Sample size still poses limitations because it is difficult to have sufficient statistical power to examine sub-groups within particular occupations, such as nurses with different specialities. There is still potential bias in controlling for many of the confounding factors. Dietary information is still quite limited as is information about physical activity. Retrospectively constructing exposure profiles leaves considerable room for bias and error. It would be valuable to add biomarkers into the data as an indicator to exposure but there are still many scientific limitations to overcome.

The CROME and LOHR findings, in spite of these limitations, replicate other studies that found elevated breast cancer risk among women engaged in farming (Band et al, 2000; Duell et al., 2000). LOHR also captured the early age of women who recorded their first job as agricultural. This is an area that should be further studied as it connects with the endocrine disrupting theories on the potential harm of exposures related to life cycle. LOHR also examined the potential impact of breast cancer risk from women who worked in agriculture and then went on to new careers in nursing or auto manufacturing. This is another area that deserves more attention, although the risk factors at this point are unclear. Could the exposures to pesticides, for instance, at an early age, initiate DNA damage that is later promoted by exposures encountered in other work settings, perhaps further complicated by such factors as dietary choices and weight, and such occupational requirements as shift work?

The case studies' methodology and approach were informed by the scientific literature that accounts for occupational risks while controlling for possible confounding factors. It was also grounded in the action-collaborative research model that recognises the centrality of the populations at risk.

The CROME study helped to secure new funding to maintain the research, particularly for the examination of occupational risk factors and breast cancer. The success in acquiring grants from the Workplace Safety and Insurance Board, the Canadian Breast Cancer Foundation, the Breast Cancer Society of Canada, and the Green Shield Foundation for a total of approximately \$700,000 lends credibility to the undertaking (Mandel, 1999).

10.5 Outcomes – critical examination

The scientific and medical community have shown active interest in the research findings. Physicians have expressed support (Barnard, 1999). There was also a request from the Chief Medical Officer in London, Ontario for a presentation regarding suggestions for how similar research might be initiated in that community (Brophy and Keith, 2002a). The community of London, particularly its labour movement, remains committed to pursuing a joint research initiative to collect occupational histories throughout southwestern Ontario.

Based on the success of the research initiative, the Occupational Health Clinics for Ontario Workers (OHCOW) provincial board called for more support for this work and made the issue of occupational cancer a priority (Occupational Health Clinic for Ontario Workers, 2004).

The findings were reported in the Canadian national press including the Canadian Broadcasting Corporation (CBC) radio and television, the Globe and Mail in Toronto, the local press including the Windsor Star and Sarnia Observer, and numerous media including agricultural papers and journals (see Appendix QQ and RR). Media attention has increased the credibility of the undertaking and supports the original concerns of the trade union health and safety activists regarding the association between cancer and work. This increased public awareness about the need to examine possible occupational associations and cancer, as well as, to better understand breast cancer risk factors. The American Public Health Association Occupational Health section bestowed its year 2000 International Award to two

members of the research team (including the author) in part for this research into occupational cancer.

The publicity also brought participation from previously uninvolved sections of the community. University of Windsor researchers, for instance, had given little attention previously to occupational health issues. However, as the research programme grew and became more widely known, a number of its faculty offered to collaborate. The new multidisciplinary research team has now expanded to include a medical geographer, biologists, health researchers and occupational epidemiologists. This augmentation of the team has built the research capacity in a community that traditionally had few resources devoted to occupational health in general and occupational cancer in particular.

10.5.1 Trade union reaction

Trade union groups became active in promoting the work initiated in Windsor with the CROME research. The Ontario Federation of Labour (OFL) passed a resolution at its biennial convention calling for all cancer treatment centres to collect the occupational histories of cancer patients (Ontario Federation of Labour, 1999a). The OFL further petitioned Cancer Care Ontario to include the prevention of occupational cancer in its strategic plan, which included the gathering of work histories of cancer patients (Ontario Federation of Labour, 1999b). The Canadian Auto Workers (CAW) launched a national cancer prevention campaign (Canadian Auto Workers, 1998). The Windsor and District Labour Council supported the project and lent its voice to the continuation of the research (Parent, 1999).

Even with the lack of support from Cancer Care Ontario for the LOEHR research, the funders and trade union bodies, including the Canadian Labour Congress, maintained their backing and encouraged unions across Canada to demand that this work continue (Service Employees International Union, 2003). Numerous Windsor trade union locals continue to give financial and political support to the research efforts.

10.5.2 Reactions of women's organisations

Women's organisations were also particularly interested in learning more about possible occupational links to breast cancer and put pressure on the Canadian cancer establishment to more aggressively address occupational and environmental risk factors for breast cancer (Brophy and Keith, 2004, 2003d; Brophy, 1999a).

Two of the major funders, the Canadian Breast Cancer Foundation (CBCF) and the Breast Cancer Society of Canada (BCSC) featured the LOEHR research as part of a new effort to study occupational risk factors for breast cancer (Canadian Breast Cancer Foundation, 2003; Breast Cancer Society of Canada, 2003).

10.6 Lessons learned

In critically evaluating the overall efforts to assess cancer causality, as described herein, it is important to examine the strengths, limitations, opportunities and barriers faced by populations at risk and advocacy groups, such as trade unions and women's organisations.

10.6.1 Strengths

The simple initiation of a process of collecting occupational histories of cancer patients was a major breakthrough in terms of the normal practice of a Canadian cancer treatment centre. This local, community-based initiative grew out of trade union and community concern about occupational cancer. A radical, socially transformative occupational health perspective had emerged in Windsor during the 1980s. Health and safety activists became convinced that workers must be intimately involved in protecting their own health. Further, they learned that occupational cancer is linked to deeper political issues regarding power and control of the work environment and indeed, the structures of capitalist society itself (Lynd and Lynd, 2000; Sass, 1986). Aspects of this perspective find parallels in earlier struggles for racial equality and women's rights with their calls for inclusion and respect for their own knowledge (Moses and Cobbs, 2001, pp. 23-57; Brown and Mikkelsen, 1990, p.3). Workers and community advocates' demands to be directly involved in setting cancer policy convinced WRCC oncologists that cancer prevention required an occupational as well as a lifestyle focus (Rennie, 1999a).

The collaborative community-based approach now gave the unions and sections of the women's health movement a direct link to cancer research and policy. Their participation built an active constituency to implement change based on a research model. In turn, the research team benefited from the knowledge and experience of the populations at risk, such as trade union health and safety representatives.

The collaborative relationship also provided a model for conducting such research. Labour activists in other communities, such as London and Oshawa, Ontario are

now discussing launching similar undertakings based on the Windsor experience. They are establishing coalitions and ensuring that they will be directly involved in the development of the research.

The research findings challenged the previously accepted views of organisations such as Cancer Care Ontario (CCO) and led them to pay more attention to this issue (Krieger et al., 2003). In spite of CCO's reluctance to act on the recommendations of public health advocates and trade unions to implement a programme tracking the occupational histories of cancer patients (Ontario Federation of Labour, 1999b), CCO held forums that included the Windsor researchers and acknowledged that the incidence of occupational cancer was significantly underreported (Cancer Care Ontario, 2000; Hellyer et al., 2000).

The research has also influenced social policy. It created a political space for national cancer research funders who wished to examine new approaches to understanding the continuing rise in cancer incidence (Canadian Breast Cancer Foundation, 2003).

The local medical community is also becoming increasingly aware of the avoidable causes of cancer, including occupational risk factors (see Appendix PP). As Dr. Abe Reinhartz commented in support of the LOHR research:

... from a practicing physician's point of view, much of my work is involved in palliative care. Many of the people who I see are in the end stages of life with malignancy. It has always impressed me as to the number of cancers that could be possibly attributed to work but which go unreported. And my impression is that the incidence of occupationally related cancer is significantly underestimated, and that by taking occupational histories when

patients enrol in cancer treatment centres, I think we'll identify exposures and risks which previously have not been identified, and which will allow us, meaning the global us, to intervene in some way to decrease the incidence of this disease. There's no question that occupational cancers are underreported, and as a corollary, are undercompensated. And I think that this initiative, where occupational histories are going to be recorded at point of entry is extremely useful and will generate data, which up until now has not been available (Interview with A. Reinhartz: Keith et al., 2000).

The research process to collect occupational histories in Windsor has succeeded in demonstrating that such an endeavour can provide scientific information that is useful for developing cancer prevention strategies. The research method further demonstrates that occupational risk factors need to be examined if cancer prevention is to have greater success. The action orientation and collaborative nature of this research also provides a model that deepens the research process by including the experience and knowledge of the populations at risk.

These positive features of the Windsor research, however, should be seen in the broader socio-political context that continues to deny the experience of groups such as trade unionists and breast cancer prevention advocates. The lifestyle perspective of cancer causality remains predominant. Occupational cancer is generally treated as an artefact of the past. There are only a few Canadian professionals prepared to seriously engage with populations at risk in a manner that is "participative, non-expertist; subjective; and collective in nature" (Watterson, 1994a). Occupational cancer research is still rare with no local cancer centres directly involved.

Communities and workers find themselves increasingly trapped into choosing between their livelihoods and their health (Keith and Brophy, 2004; Brophy, 1992,

1991; Kazis and Grossman, 1982). Women, trade unions, and their public health advocates will have to develop collaborative strategies to overcome systemic barriers. Global capitalism continues, largely unabated, to demand a generally unregulated economy, which frightens workers and their communities into accepting working conditions for fear of job loss. Women's organisations are increasing losing their financial resources and finding it more difficult to mount campaigns.

10.6.2 Limitations

The designs of CROME and LOHR have scientific limitations that were described in previous chapters. Even with the improvements in LOEHR, this study design cannot provide, on its own, unequivocal evidence of causal associations - - seldom can any single research study do so. Moreover, the biological effects of endocrine disruption will take decades to be properly measured and understood. Enormous scientific work will be required to identify biomarkers, if they exist at all, that emerge from prenatal and other exposures in humans.

The LOEHR research on its own will only provide a small piece of the puzzle. So the limitations of science itself will act as a barrier to action. Each finding requires additional testing to determine whether the results can be replicated. So workers and other populations at risk can be left with a continuing cancer risk while science searches for answers. These scientific limitations must be evaluated in terms of how much proof is required before social policy will be implemented to prevent harm.

The precautionary principle, therefore, is required to move the process of prevention in a timelier manner (Evans, 2002). This perspective of preventing harm, however, challenges the power of corporations and regulators by valuing human safety ahead of “corporate profits and government stability” (Brown and Mikkelsen, 1990, p.63). The imbalance of power is exacerbated by the new global economy rife with its borderless trade agreements; “The precautionary principle and the citizen’s opinion were thus to be thrown aside in favour of an absolutist theory of commercial exchange” (Saul, 2004, p. 37).

Beyond the limitations of the Windsor research methodology itself there are broader systemic limitations. Scarcity of funding for the CROME and LOHR research limited the number of breast cancer patients and community controls who could participate and thus diminished the statistical power. The activist history of Windsor cannot be *copied and pasted* onto other communities, so the role of the populations at risk could be more circumscribed in communities where such a tradition is not as developed. The findings of the two case studies still have not identified the specific exposures so it is still not possible, for example, to advance a stronger regulatory policy towards pesticides in an agricultural setting.

The collaborative nature of this research creates conflict between the Windsor research team and the Ontario cancer agency. The researchers were described as being “advocates” and “pro-union” by a Cancer Care Ontario official with the suggestion that the findings would be biased and unreliable (see Appendix MM). This remark should be seen in the wider context of the ongoing scientific conflict over cancer aetiology. When trade unions and other popular groups demand

inclusion into public health issues, “scientific professionals object because they need to defend their professionalism, institutions, or political-economic alliances” (Brown and Mikkelsen, 1990, p. 146).

The professional scientists at the universities and inside the cancer establishment have a wide range of attitudes and agendas towards occupational cancer, popular epidemiology and community participation. The researchers are in general also constrained by the powerful private vested interests that define and direct scientific research (Rosenstock and Lee, 2002). Many local university researchers and medical professionals would not participate unless the “advocacy” component of the research was played down. Others were prepared to support this in private but publicly felt uncomfortable. There is still a core group of the research team that is fully supportive of the broad collaborative community based approach and it is this group that respects the knowledge and expertise of trade union, women, environmental or community activists (Brown and Mikkelsen, 1990, pp. 125-163). Because this research was not initiated or controlled by Cancer Care Ontario, it is generally unsupportive. Only when CCO’s “approved” specialists direct the research process is it regarded as valid (see Appendix LL). This dynamic reflects the wider political and scientific issues that still dominate the field of occupational cancer research, and will need to be challenged if undertakings similar to CROME are to be implemented.

The Windsor experience illustrates a new kind of approach to scientific inquiry. It questions, “what science is, whom it should serve, and who should control it” (Brown and Mikkelsen, 1990, p. 154). Despite peer reviewed publications and

successful peer-reviewed funding applications, the Windsor cancer research is still generally isolated from the mainstream scientific community and therefore, is vulnerable to being eventually stopped through a combination of political pressure and inadequate financial resources.

The collaborative, action-based nature of the research is an important aspect of the Windsor research initiative. There are difficulties, however, maintaining the relationship between labour, professionals and community activists. Since the inception of CROME, trade union health and safety activity has waned (Firth et al, 1997, pp: 91-93). Occupational cancer is not the priority it once was because the threat of job loss in the current economy has caused the trade unions to become more corporatist in the hopes that employment can be preserved through cooperative strategies with multinational corporations and the state.

At a local level, there seems to be a ubiquitous reluctance to acknowledge these public health issues. This is not only at the level of local governments, but also in relation to industry, the unions, and the academic and medical establishments. Local activist organisations have been effectively sidelined into projects on preservation of wetland and woodland habitats rather than being focused on issues of injury to health...(Gilbertson and Brophy, 2001, p. 841).

10.6.2.1 From registry to case-control

The transformation of CROME – a crude registry that included all cancer patients – into LOHR and LOEHR – case control studies examining just breast cancer – represents a diversion from the original goals of the research. The project was initially envisioned as a means to track the occupational histories of all cancer

patients. The CROME experience taught an important lesson – the collection of work histories requires full time research staff who can devote themselves to this task. The initial data-gathering tool of a touch screen computer was ineffectual. Cancer patients wanted to speak to someone directly about their experiences but there was no source of funding to allow the cancer treatment centre to allocate personnel resources for such a practice. In the absence of financial support, a decision was made to pursue funding to further explore the CROME hypothesis of breast cancer and farming through LOHR and then LOEHR. The studies represent a further refinement of the CROME investigation but it comes at the expense of the development of a more general occupational history registry of all cancer patients. The registry and case control approaches are not mutually exclusive. The original idea was to do exactly what occurred. By identifying through CROME a group of workers that had an elevated risk for a particular cancer, a hypothesis would be generated and tested through a case control study. However, the cancer registry was intended to continue as it built up additional cases and generated new hypothesis.

10.7 Summary

The research questions were answered and the objectives of the dissertation were evaluated. Debates about cancer causation over many decades have shaped much of the current thinking, funding, policy and practice of government and medical and scientific groups. The dominant ideology has downplayed occupational and environmental influences on, causes of, and contributors to cancer causation. The collaborative occupational cancer research presented in the case studies has contributed to our understanding of occupational cancer; it has demonstrated the importance of collecting the work histories of cancer patients as a tool in identifying

potential populations at risk; it also provides a basis for formulating prevention strategies and protective social policies. This effort to identify risk factors for breast cancer, may better serve the interests of science and human health if it is more widely adopted. As one occupational health physician commented:

...I think it would be best if this were adopted internationally. A registry is only being done in Windsor at this time but I don't think it would be a difficult task to adapt it to every cancer treatment centre in Ontario, and then in Canada, and then in North America. The more people we gather data on, the stronger the associations and the more power to the research. It would be great if this became a standard protocol in every cancer treatment centre internationally (Interview with A. Reinhartz: Keith et al., 2000).

The next chapter will conclude the dissertation with a summary and additional proposals for future research.

CHAPTER 11: CONCLUSION

11.1 Introduction

The chapter will review the research and findings presented and give a brief appraisal of its potential implications, along with a few ideas for future research. The chapter offers some specific proposals for action and development.

11.2 Overall Perspective

Cancer incidence in general continues to increase throughout the industrialised world and now in less economically developed countries (Parkin et al., 2001). An ageing population alone cannot explain this phenomenon as age-adjusted incidence continues to climb (Epstein, 2003). What may be a largely preventable disease is projected to become the leading cause of death in industrialised societies such as Canada (Chernomas and Donner, 2004).

There is a broad range of economic and political interests that are threatened by a full understanding of the aetiology of cancer. Industry and cancer agencies argue that the predominant cause is lifestyle factors – *blaming the victim* – while unions, environmentalists, women's health organisations and public health advocates cite the toxic impact of tens of thousands of synthetic chemicals (Evans, 2002; Toronto Cancer Coalition, 2001; Canadian Auto Workers, 1998).

The largely unregulated marketing of synthetic substances sets the stage for human exposures. Initially, the workers and their immediate communities are involved in the production process. Secondly the general population's exposure to toxic substances increases greatly as these chemicals become ubiquitous through the

environment. Pesticides pose not only potential harm for the workers in the pesticide industries or in agricultural areas but are now found in food, in the environment; and some are found in the blood and fat of individuals throughout the globe. As industrial pollution threatens the atmosphere and increases the risk of melanoma and other types of skin cancer, the cancer agencies are devising strategies that place responsibility on the individual to stay out of the sun. Corporations continue to produce toxic substances, such as tetraethyl lead, that are banned in industrialised countries while exporting these hazards to poorer countries. In countries like Canada, asbestos is mined and exported while hundreds of workers in communities like Sarnia, Ontario suffer from asbestos related diseases, which go largely unreported and unrecognised. Canadian cancer agencies fail to even record occupational cancers, such as mesothelioma. Government policy is to allow cancer agencies to medicalise cancer through focusing on treatment modalities with more and more reliance on the development and clinical trials of anti-neoplastic drugs. Primary prevention in occupational health is seldom adopted; the actual impact on cancer incidence of occupational and environmental exposures continues to be downplayed.

The research outlined in the dissertation occurred within this scientific, social, and political context. The *war against cancer* has failed to stem the tide of this disease (Proctor, 1995; Beardsley, 1994). James Watson, a renowned scientist associated with the discovery of the DNA double helix, referred to the *cancer establishment* strategy to control cancer as “a bunch of shit” (Proctor, 1995, p.4). In spite of such dismissive comments, the scientific debate regarding the avoidable causes of cancer has continued without resolution, leaving the preponderance of prevention activities

directed towards individual lifestyle factors. No Canadian jurisdiction has accepted the challenge of Doll and Peto to collect the occupational histories of cancer patients (Brophy et al., 2002). Over 85,000 chemicals were ~~are in use~~ were released into the market with little or no testing for their impact on human health (Evans, 2001). Scientists such as Epstein contend that these substances have become ubiquitous throughout the environment; controlling the harm they pose remains shielded, however, by multinational corporations, governments, and national cancer establishments which promote the idea that the cause of cancer lies largely with each individual's personal lifestyle choices, such as tobacco use, or their genetic makeup while negating the impact of social factors, environmental conditions, and the socially tolerated practice of industrial production and distribution of carcinogens (Clapp, 1998). New theories are identifying the risks of substances that disrupt the hormonal system and their possible impact on breast cancer risk (Colborn et al., 1999). This innovative perspective is challenges scientific assumptions, while posing new opportunities for prevention (Myers, 2002a, 2002b).

There have been several provocative Canadian epidemiological studies on occupational cancer. However, the Ontario compensation board and cancer agencies view the risk of workers developing cancer due to their exposures at work as relatively minor (Cancer Care Ontario 2003, 2003a; Chovil et al., 1981). Such a perspective underscores the barriers to occupational cancer prevention faced by workers. Work-related cancer is underreported, underestimated and undercompensated and thus, remains a "silent epidemic" (Watterson, 1999).

11.3 The state of play in 2004

The research presented in the dissertation addresses, in part, the shortcomings of the dominant view. There is a need to explore further the issue of causality.

Occupational cancer continues to pose a serious public health threat (World Health Organisation, 1999a; Landrigan, 1996; Landrigan and Markowitz, 1989). Asbestos exposure alone is estimated to cause between 100,000 to 140,000 cancer deaths a year and is responsible for 5 to 10 million deaths world wide “past and present” (Landrigan, 2004, p. 125; Peto et al., 1999). Even the lowest projections of risk posed by occupational exposures represent a substantial number of cancer cases among the exposed population (Nicholson, 1984).

Breast cancer is the most common cancer among women throughout the world and yet few studies examine possible associations to exposures at work. Only ionising radiation is accepted as a definite occupational breast cancer risk (Brody and Rudel, 2003).

Occupational breast cancer risk has garnered minimal public attention, often remaining hidden and unrecognised (Watterson, 1999). Within the scientific community, substantial conflict remains about the avoidable causes of cancer. United States cancer agencies, for example, devote limited funds to prevention while the bulk of their monies are spent searching for a cure (Epstein, 1998a).

To develop a cancer prevention strategy that moves beyond this conflict, an analysis was carried out of the scientific literature and cancer community activity on these diseases with particular reference to occupational cancer and then, drawing on that analysis, a community-based collaborative action research project was undertaken in Windsor, Ontario, Canada. It was hoped that, by collecting the occupational histories of cancer patients, potential cancer risks could be identified and subsequently acted upon. The involvement of the community in this effort would provide the social support to advance protection against risks.

The initial research findings of an elevated breast cancer risk among women who ever farmed refocused the undertaking to analyse more specifically the possible associations between occupational and environmental exposures and breast cancer risk. This analysis demonstrates that breast cancer remains an unsolved public health crisis. The majority of breast cancer cases cannot be explained by known risk factors (Health Canada, 2001; Madigan et al., 1995). Few epidemiological studies have scrutinised the potential occupational breast cancer risks in general and for farming in particular (Zahm and Blair, 2003; Aronson and Howe, 1994).

Laboratory scientists have, however, identified through animal bioassays, over 200 chemical substances that trigger breast carcinogenesis (Brody and Rudel, 2003; Brown and Lamartiniere, 1995; Stevens et al., 1994). Although such agents exist in high concentrations in many workplace environments, their influence on breast cancer incidence among exposed workers has remained largely unstudied.

The peer reviewed Windsor research findings affirmed similar results to other epidemiological studies that found elevated breast cancer risk among women

employed in certain types of farming (Band et al., 2000) or exposed to agricultural pesticides during or after their application (Duell et al., 2000).

The description of Windsor and its history of documented health problems and environmental exposures provided the context for the empirical research examined in the dissertation. Windsor, located in the Great Lakes Basin, is highly unionised with a long history of labour activism (Adkin, 1998). For over twenty years health and safety activists in collaboration with community advocates demanded that carcinogens in the workplace be eliminated (Firth et al., 1997, pp: 40-59; Lynd and Lynd, 2000, pp: 187-198). This network built a community supported health and safety information centre, organised a cancer prevention coalition, generated numerous cancer prevention and awareness campaigns, and established precedent setting compensation cases for occupational cancer (Brophy, 1999a, 1999b, 1998b, 1994b; Canadian Auto Workers, 1998). These groups, along with the trade union-directed Occupational Health Clinics for Ontario Workers (OHCOW) collaborated with the local cancer treatment centre to document cancer incidences. It is within this framework of elevated rates of disease coupled with toxic exposures in the workplace and general environment on one hand, and the politicised union tradition on the other, that explains how this precedent-setting initiative to collect the occupational histories of cancer patients was spawned.

The case studies, *CROME*, *LOHR*, and *LOEHR*, have shown the significance of collecting occupational histories of cancer patients. This research has also contributed to our understanding of breast cancer and occupational risk factors, particularly with respect to farming.

The success of *CROME*, *LOHR* and now the launching of *LOEHR* afford new opportunities to influence public policy and social change. This new collaborative research, however, also threatens the dominant cancer institutions and their approach to cancer prevention. It is understood that “Popular participation threatens not only the division of knowledge and power between laypersons and professionals, but also the corporate system that produces environmental hazards” (Brown and Mikkelsen, 1990, p. 151). This research approach, which is directly connected to the community, also strengthens the public’s ability to take preventative action to address public health issues by increasing their awareness and confidence to tackle these problems (Watterson, 1995c).

In the face of scientific uncertainty the reduction of occupational cancer risk calls for a precautionary approach, but this implies that the populations at risk must be fully engaged and activated to demand involvement and accountability (Harremoes et al., 2001).

11.4 Possibilities for the future – research, methods and professional practice

Over nine years have elapsed since the first meetings were held between representatives of the labour-sponsored Occupational Health Clinics for Ontario Workers and the Windsor Regional Cancer Centre. The survival of the research attests to the needs it addresses and the support that it has engendered. Its continuation heralds possibilities for the future as the research team becomes more multidisciplinary and the community becomes more active and aware.

The Windsor community remains concerned about the need for this kind of research and for developing cancer prevention strategies with citizen participation (WOHIS, 2004). The new LOEHR research into breast cancer allows for this undertaking to further influence the scientific, broader community and trade union groups regarding the importance of occupational risk factors. For example, it is the intention of the researchers to establish a community advisory committee for the LOEHR study in order to begin to facilitate a more collaborative relationship and thus, build on the tradition of collaboration.

Several oncologists at the Windsor Regional Cancer Centre would like to expand the research to examine possible occupational associations with other types of cancer. Of particular interest are the continuing incidences of lung cancer among lifetime non-smokers, of non-Hodgkin's lymphomas and of prostate cancers (*see Appendix LL*).

There is also increasing credibility among a wide spectrum of researchers and public health advocates for the groundbreaking attempts in Windsor to examine possible occupational risk factors (Ho, 2003). The Nursing Faculty at the University of Windsor, for example, has just launched its first graduate course on the Environment and Health. Individual nursing faculty wish to collaborate with the current LOEHR research team in its investigations, including the idea of using participatory action research techniques, such as mapping, to document the historical exposures of women working on the farm and in the hospitals (Keith and Brophy, 2003c).

The Canadian Labour Congress (CLC) is demonstrating renewed interest in the issue of occupational cancer. In May 2003, after a presentation by the author of the dissertation, the CLC recommended that all of its affiliates write letters to Cancer Care Ontario (CCO) in support of the Windsor LOEHR research. This initiative is part of a deeper reconsideration of the Canadian trade unions towards their relationship with the cancer agencies. There appears to be a critical rethinking about the systemic issues and the roles being played by organisations such as Cancer Care Ontario. The emergence of occupational disease disasters, such as the asbestos disease epidemic in Sarnia, Ontario, has heightened trade unionists' consciousness of the systemic barriers to cancer prevention (Keith and Brophy, 2004; Mittelstaedt, 2004; Brophy and Parent, 1999d) and the need for them to actively advocate for occupational cancer prevention.

The women's health movement is also keenly interested in the identification of occupational risk factors and breast cancer. Breast cancer action groups across Ontario continue to support this research and demand that greater emphasis be given to environmental risk factors. There is particular interest from women in agricultural communities about the incidence of breast cancer. More interaction with this traditionally underserved population will be nurtured as the LOEHR research unfolds (Wright, 2003).

The local medical community too is becoming more interested (*see Appendix PP*).

11.4.1 Obstacles

The current balance of power as expressed by the control of the multinationals in the global economy and especially in the agricultural, chemical, engineering, pharmaceutical and related industries makes addressing the cancer epidemic, from the perspective of the populations at risk, difficult. The anti-regulatory ideology espoused by powerful business interests' demands that governments loosen regulations that control toxic exposures in the workplace and in the environment. The consequence for workers' health is obvious. According to the World Health Organisation (WHO), occupational cancer represents the largest cause of work-related mortality globally (1999a); with the continued transfer of hazardous industries to developing countries, paired with an anti-regulatory state policies in developed countries, occupational cancer will likely remain prevalent.

Women and the breast cancer action networks seem less captive to the economic pressures that currently influence trade union strategies. This group may prove to be instrumental in maintaining this research agenda and in pressuring governments to enact the precautionary steps required to tackle the increasing incidence of breast cancer worldwide. They have shown a keen interest in this research and have been staunch supporters (see Appendix SS; Breast Cancer Action Kingston, 2004).

These groups, however, are also experiencing a loss of financial support.

In spite of many obstacles there are some hopeful signs that cancer agencies and other local communities are becoming more interested in such research initiatives.

Cancer Care Ontario and the Workplace Safety and Insurance Board now recognise

the need for some form of occupational cancer surveillance and are developing a joint programme utilising their provincial databases (Holowaty et al., 2003).

The community of London, which has one of the leading cancer treatment centres in Ontario, is examining possible collaborative research after discussions with the London labour council and with the support of the Medical Officer of Health. Trade unions and community groups are utilising a video produced on LOHR to educate their members about the need for data collection and community involvement in cancer research and prevention (Keith et al., 2000; Welch, 2000).

The action based collaborative research that began by collecting occupational histories of cancer patients has provided a useful model for identifying elevated cancer risks within certain working populations, particularly women with breast cancer who ever engaged in farming. Over time, breast cancer aetiology has become the primary focus of the Windsor research. This research process has revealed some of the barriers that exist to fully exploring the cancer burden of the working populations. While this research has recognised limitations, it has nevertheless successfully provided a method to examine the cancer burden of a given population and has produced results with practical applications.

The CROME and LOHR research has produced a model for other communities to explore the role of occupation in cancer causality. This methodology is based on the scientific literature that recognizes the role of carcinogens in the workplace as a possible etiologic agent in cancer incidence and the central role of the populations at risk in the investigative process and in implementing cancer prevention initiatives.

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International Joint Commission
Commission mixte internationale

December 18, 2003

Mr. James Brophy, Director,
Occupational Health Clinic for Ontario Workers,
171 Kendall Street
Point Edward, Ontario N7V 4G6

Dear Mr. Brophy:

I am responding to your request for a letter concerning the use of our joint paper in preparing your thesis. The paper was based on health data and statistics that had been compiled by Health Canada around 1998 for the 17 Canadian Areas of Concern. The report on the Detroit River was made available to you in 1999 on a privileged basis and all the other 16 published reports were made available after the Biennial Meeting of the International Joint Commission in the fall of 1999. In the spring of 2000, the Great Lakes Science Advisory Board hosted a workshop on community health, based partly on the Health Canada reports. There was a special section on Windsor and you contributed to that by giving a presentation on occupational health and safety at that session.

The workshop speakers were asked to prepare papers for publication in *Environmental Health Perspectives* and you and I subsequently decided to jointly publish the paper on Windsor. We decided, based on the transcript of your presentation that we should cast the health data and statistics in a social, economic and political context. The reviewers of the draft paper were all agreed that this section should be removed, but we demonstrated to the editors that they had recently published a paper in their journal saying that the crisis in risk-based epidemiology could only be overcome by linking to molecular epidemiology, reconnecting with public health and expressing the findings in a social, economic and political context. The editors were impressed with this viewpoint and published the paper as submitted (EHP 106, Suppl.6: 827-843). The permission of Health Canada to use the health data and statistics for this purpose was obtained prior to publication.

In that the paper has been influential in galvanizing the community to establish a new Centre for Environmental Health, I think it was successful. That success in no small way reflects your contribution in participating in the workshop and in preparing the paper. Based on this, I am pleased to give you permission to use the paper in whatever manner you require for the purposes of preparing your thesis.

Yours sincerely,

Michael Gilbertson, Secretary,
Workgroup on Ecosystem Health,
Great Lakes Science Advisory Board.

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Appendix B:

Computerised Record of Occupation Made Easy (CROME)

With respect to the CROME research, the author of this dissertation was a principal initiator of the CROME research study and was the principal author of the peer reviewed journal article that outlined the case control studies' findings (Brophy, et al., 2002). The author of this dissertation helped to direct the development of the CROME database, the questions to be recorded and how they would be structured, the involvement of the Industrial Disease Standards Panel (IDSP)¹ and the consultation with the Canadian Auto Workers (CAW) health and safety representatives. The management of the project was essentially the task of the author of this dissertation in partnership with Dr. Ethan Laukkanen.

It is important, however, to acknowledge and credit the other members of the research team who also made important contributions to this research undertaking. Margaret Keith, executive director of the Windsor Occupational Health Information Service, was instrumental in developing the different industrial and occupational choices utilized in the CROME programme along with supervising the initial database and questionnaire used to validate CROME. Dr. Ethan Laukkanen, Windsor Regional Cancer Centre, developed the "touch screen" programme with the Lotus Notes framework and supervised its implementation at the cancer center (*see Appendix C*). Drs. Abraham Reinhartz and Deborah Hellyer provided medical direction such as determining diagnostic eligibility requirements; they also consulted regarding possible occupational exposures. University of Windsor

¹ The Industrial Disease Standards Panel (IDSP) will be described in more detail later in this dissertation. In the 1990s its name was changed to the Occupational Disease Panel (ODP). For the purposes of this dissertation, the names will be used interchangeably and will refer to the same governmental body (Occupational Disease Panel, 1995).

epidemiologist, Dr. Kevin Gorey, conducted the statistical analysis. Dr. Andrew Watterson mentored the author of this dissertation throughout this process; he especially contributed with his knowledge of pesticides and their potential association with breast cancer.

Financial Assistance for CROME

CROME was supported in part by the Ontario Occupational Disease Panel (ODP), which funded some initial computer programming and participated in evaluating the reliability of the responses given by patients when utilising the computer. The chair of the ODP, Ms. Niki Carlan, was very active in the development and support of this research tool. The Canadian Auto Workers: National Automobile, Aerospace, Transportation and General Workers Union (CAW) provided funding for a University of Windsor graduate student to work for approximately twelve weeks as a research assistant to help check the data. The Windsor Regional Cancer Centre (WRCC), the Windsor Occupational Health Information Service (WOHIS) and the Occupational Health Clinics for Ontario Workers (OHCOW) in Windsor provided staff supports to assist the patients with data entry and validate the questions. With the dissolution of the Occupational Disease Panel in 1996 the WRCC, WOHIS and OHCOW – Windsor maintained the role of directing this project and assuring its continuation.

The author of this dissertation wishes to acknowledge the following individuals for their assistance: Jette Burton, Michelle Carom, Jianping Cui, Pat Dugal, Gregg Elstone, Alice Ergicak, Alan Hall, Lyle Hargrove, Janice Holland, Jadro Mevic,

Nicole Mahler, Cynthia M. Meyer, Edwin Y. Ng, Rory O'Neill, Robert Park, Michael Raymond, Ann Sovan, Gord Taylor, Jason Tung, and Tanya Zillich.

Lifetime Occupational History Record (LOHR)

The findings of the Lifetime Occupational History Record (LOHR) are currently being prepared for publication. The author of this dissertation is the principal investigator and author. Other co-investigators include: Margaret Keith (*see Appendix D*), Kevin Gorey, Abraham Reinhartz, Deborah Hellyer, Ethan Laukkanen, and Andrew Watterson, who have already been cited. Kevin Gorey lent his credentials to the LOHR funding proposal and prepared the literature review that was used in our successful grant application to the Workplace Safety and Insurance Board (WSIB). Michael Gilbertson offered his expertise regarding the impact of endocrine disrupters and possible biological mechanisms that might contribute to breast cancer pathogenesis.

Hakam Abu-Zahra replaced Ethan Laukkanen as WRCC research representative offering important insight to medical issues surrounding breast cancer. Isaac Luginaah, a University of Windsor medical geographer, joined the research team and assisted with statistical analysis.

Financial Assistance for LOHR

This study was supported in part by the Ontario Workplace Safety and Insurance Board (WSIB) Research Advisory Board (RAC) (Workplace Safety and Insurance Board, 1999). The \$250,000 grant from the WSIB arose from an application in

which the author of this dissertation participated as a co-author and member of the research team. During the two-year case control study the author of this dissertation acted as co-principal investigator. During the last year of the project the author of this dissertation acted as principal investigator after securing \$120,000 additional funding to continue the data collection process and analyse the data.

The Canadian Auto Workers: National Automobile, Aerospace, Transportation and General Workers Union (CAW) health and safety representatives advised the research team on particular workplace exposures. The Windsor Regional Cancer Centre (WRCC) and the Occupational Health Clinics for Ontario Workers (OHCOW) provided staff support to code the jobs of the cases and community controls.

The author of this dissertation wishes to acknowledge the following individuals for their assistance with LOHR: Nicole Mahler (research coordinator); Jeff Desjarlais; Kathy Mayville; Robert Park; Cheryl Battson; Donna Bergamin; Lisa Capretta; Sharron Chouinard; Mary Cook; Janet Davis; Pat Dugal; Julie Durocher; Erin Fortier; Jeremy Garman; Chad Gibbons; Michael Gilberston; Caitlin Goyeau; Erin Goyeau; Susan Greco; Alan Hall; Johanna Krey; Michael Lax; Joyce Mady; Sharon Mailloux; Jane McArthur; Liam McCarthy; Shavaun McDonald; Joanne McGuire; Kevin McNaughton; Edwin Ng; Rory O'Neill; Barbara Ouellette; Nicholas Pieczonka; Jason Parent; Mike Raymond ; Maureen Reynolds; Bernie Rosenblum; Todd Sands; Eileen Senn; Gregory Siwinski; Ann Sovan; Janet Spiers; Stephanie Stones; and Robert Watson.

New Lifetime Occupational and Environmental History Record (LOEHR)

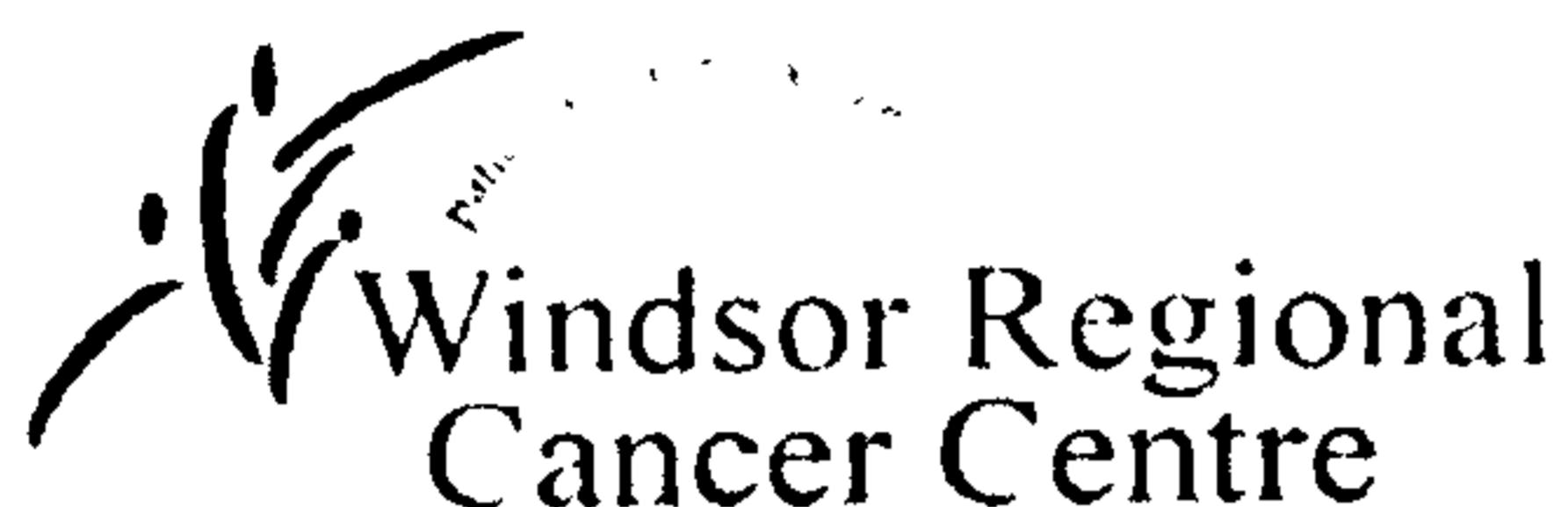
A new population based case control study, Lifetime Occupational and Environmental History Record (LOEHR), arose out of the LOHR research. LOEHR has an enhanced research team. The author of this dissertation and Margaret Keith are co-principal investigators. Co-investigators include: Isaac Luginaah, Hakam Abu-Zahra, Michael Gilbertson, Abraham Reinhartz, Deborah Hellyer, Eleanor Maticka-Tyndale, Peter Infante, Robert Park, and Andrew Watterson. Kathy Mayville is the staff research coordinator.

LOEHR is hosted by the University of Windsor. It is co-sponsored by the Occupational Health Clinics for Ontario Workers (OHCOW) and is being carried out with the cooperation of the Windsor Regional Cancer Centre (WRCC).

Financial Assistance for LOEHR

Funding for this research was provided by the Breast Cancer Society of Canada (\$60,000 over two years), the Canadian Breast Cancer Foundation (\$169,520 over three years), and the Green Shield Foundation (\$10,000 for one year). The research has been endorsed by the Canadian Labour Congress.

Appendix C



2220 Kildare Road, Windsor, ON, N8W 2X3 Ph: 519-253-5253 Fax: 519-971-9922

February 5, 1999

Mr. Jim Brophy
Executive Director
Occupational Health Clinic
547 Victoria Avenue
Windsor, ON N9A 4N1

Dear Mr. Brophy:

re: CIROME project

In response to your letter of January 5th, the Windsor Regional Cancer Centre is pleased to support your plan to focus on the regional occupational history project in support of your post graduate thesis work.

Our Centre would be pleased to work with you and your collaborators in all feasible ways to ensure the success of your initiative.

Yours truly,

A handwritten signature in black ink, appearing to read "E. Laukkanen".

Dr. Ethan Laukkanen
Chief Executive Officer
EL/cr



A Cancer Care Ontario Regional Cancer Centre
Un centre régional de cancérologie de Action Cancer Ontario



March 19, 2004

Dr Andrew Watterson
University of Stirling
Stirling, UK
FK9 4LA.

Dear Dr Watterson:

James Brophy and I are co-principal investigators of the current occupational breast cancer research study entitled Lifetime Occupational and Environmental History Record (LOEHR) in Windsor, Ontario. I was also a co-investigator of the preceding studies: Computerized Recording of Occupations Made Easy (CROME) and the Lifetime Occupational History Record (LOHR).

Mr Brophy was the initiator and principal investigator of CROME. He was the initiator and co-principal investigator of the first funding phase of the ensuing LOHR research and principal investigator of the second funding phase of the LOHR research. Mr Brophy was principal author of the articles reporting on the CROME and LOHR study findings.

The research team supports Mr. Brophy's use of the CROME, LOHR, and LOEHR research studies in his PhD dissertation.

Sincerely,

Margaret M. Keith
Adjunct Faculty

Appendix E: Chemicals Shown to Induce Mammary Tumours in Animals

(US National Toxicology Program

<http://ntp-server.niehs.nih.gov/htdocs/Sites/MAMM.html>

ACRONYCINE	2,4-DINITROTOLUENE
BENZENE	ETHYLENE OXIDE
2,2-BIS(BROMOMETHYL)-1,3-PROPANEDIOL	FUROSEMIDE
1,3-BUTADIENE	GLYCIDOL
1,3-BUTADIENE	HYDRAZOBENZENE
2-CHLOROACETOPHENONE (CN)	INDIUM PHOSPHIDE
CHLOROPRENE	ISOPHOSPHAMIDE
C.I. ACID RED 114	ISOPRENE
C.I. BASIC RED 9 MONOHYDROCHLORIDE	METHYLENE CHLORIDE
CLONITRALID	METHYLEUGENOL
CYTEMBENA	NITHIAZIDE
2,4-DIAMINOTOLUENE (2,4-TOLUENE DIAMINE)	5-NITROACENAPHTHENE
1,2-DIBROMO-3-CHLOROPROPANE	NITROFURAZONE
1,2-DIBROMOETHANE	NITROMETHANE
2,3-DIBROMO-1-PROPANOL	O-NITROTOLUENE
1,1-DICHLOROETHANE	OCHRATOXIN A
1,2-DICHLOROETHANE	PHENESTERIN
1,2-DICHLOROPROPANE (PROPYLENE DICHLORIDE)	PROCARBAZINE HYDROCHLORIDE
DICHLORVOS	RESERPINE
3,3'-DIMETHOXYBENZIDINE DIHYDROCHLORIDE	SULFALLATE
3,3'-DIMETHYLBENZIDINE DIHYDROCHLORIDE	2,4- & 2,6-TOLUENE DIISOCYANATE
	O-TOLUIDINE HYDROCHLORIDE
	1,2,3-TRICHLOROPROPANE
	URETHANE
	URETHANE + ETHANOL (COMBINATION)

Appendix F: Table 5.2: Breast cancer and epidemiological studies - occupational exposures including endocrine disrupting substances
 Exposure, study design, subjects, effect size, confidence intervals (listed in order of study's statistical power)
 OR = odds ratio; PMR = proportionate mortality ratio, RR = rate ratio, SIR = standardized incidence ratio, SMR = standardized mortality ratio
 Bolded text indicates statistically significant data

Exposure	Study, Type & First Author	Subjects	Exposure definition data source;	Effect size, range	95% Confidence Intervals	Comments
Styrene, Organic Solvents, Metal, Metal Oxides, Acid Mists	REGISTRY-BASED Cantor et al, 1995	24 US States Mortality cases = 33,509 Controls 117,794 1984-1989	Separate analysis for black and white women examining possible exposures	White Women Solvents OR = 1.09 – 1.10 Styrene OR = 1.13 – 1.38 Metals/Metal oxides OR = 1.11 – 1.14	(1.0-1.2) (1.0-1.2) (1.1-1.2) (1.0 1.9) (1.0-1.12) (1.0-1.3)	Controlled for socioeconomic status and age. Dose response based on exposure matrix. Range of organic solvents including carbon tetrachloride, methylene chloride, formaldehyde. There were also elevated ORs for asbestos and radio frequency electromagnetic fields Black women had a number of OR that were statistically significant > 2 for Styrene & cadmium
				Solder OR = 2.97 Acid Mist OR = 1.07 - 1.15 Black women Solvents OR = 1.01 – 1.20 Styrene OR = 1.41-1.59 Metals/Metal oxides OR = 1.22 – 1.75 Solder OR = .75 – 2.40	(1.3-6.6) (1.0-1.1) (1.01.3) (0.9-1.1) (1.0-1.4) (1.0-1.9) (1.20-2.1) (0.9-1.7) (1.3-2.6) (0.6-.09) (1.3-4.5)	

Exposure	Study, Type & First Author	Subjects	Exposure definition data source;	Effect size, range	95% Confidence Intervals	Comments
			Outcome measured			
60-HERTZ MAGNETIC FIELDS	Coogan et al., 1996	Four US states cancer tumour registries. Cases = 6,888 Controls = 9,529	Separate cohort into four categories: background, low, medium, high.	Acid Mist OR = 1.43-3.62 High exposure OR = 1.43 Premenopausal OR = 1.98 Postmenopausal OR = 1.33	(1.0-2.0) (1.1-12.0) (0.9-2.09) (1.04-3.78) (0.82-2.17)	Utilized exposure matrix and controlled for reproductive history And number of other breast cancer risk factors.
SOLVENTS	Hansen, 1999	Danish Cancer Registry (1970-89) Women between 20-55 years Cases= 7,802 Controls=7,802	Women employed 10> in organic solvent using industries	OR= 1.97 (Range from (1.4-2.4))	(1.39-2.79)	Controlled for Socioeconomic status and reproductive patterns
PASSIVE & ACTIVE TOBACCO SMOKE	Johnson & Mao, 2000	Canadian National Enhanced Cancer Surveillance System Premenopausal Cases = 805 Postmenopausal Cases= 1512 Controls = 2438	Active and passive tobacco smoke exposed, particularly premenopausal women	Premenopausal exposed to passive smoke OR= 2.3 Increase to almost three fold with >35 years of exposure	(1.2-4.6)	Mailed questionnaire to control for breast cancer risk factors and lifetime and occupational exposure to passive smoke.
		CASE CONTROL				
PCBs & 4-	Aschengrau et al., 1998	Incident cases = 261	incident study containing PCBs			

Exposure	Study, Type & First Author	Subjects	Exposure definition data source;	Effect size, range	95% Confidence Intervals	Comments
octylphenol		Controls = 753 Cape Cod, USA	Outcome measured an exposure assessment	OR = 3.2	(0.8-12.2)	Controlled for confounding
Shiftwork	Davis et al., 2001	Incident cases = 813 Controls = 793	in-person interview on sleep habits and bedroom lighting last ten years	4-octylphenol OR = 2.9	(0.8-10.8)	Had lifetime occupational history. Hypothesis regarding reduction of melatonin levels
Passive & active Tobacco Smoke	Morabia et al., 2000	Incident cases = 177 Controls = 170	Geneva Switzerland examining genetic reactions	Premenopausal OR = 3.2 Postmenopausal OR = 11.6	(1.2-8.7) (2.2-62.2)	Examined polymorphisms from buccal cell DNA
Polycyclic Aromatic Hydrocarbons and Benzene	Petralia et al., 1999	Premenopausal cases = 301 Controls = 316	Western New York State, 1986-1991	High exposure to benzene OR = 1.95 High exposure to PAHs 2.40	(1.14-3.33) (0.96-6.01)	Exposure assessment and controlled for tumour oestrogen receptor (ER) status.

Exposure	Study, Type & First Author	Subjects	Exposure definition data source;	Effect size, range	95% Confidence Intervals	Comments
			Outcome measured			
Shiftwork	Schernhammer et al., 2001	Incident Cases= 2441 Baseline population = 78,562	11 U.S. States, Nurses Health Study 1988-1998	Nurses who worked 30> years on the night shift RR = 1.36	(1.04-1.78)	Moderate increased of breast cancer risk among women working rotating shifts for extended period of time.
Laboratory technicians, telephone and telegraph operators, leather and fur processors & glass workers	Gardner et al., 2002	Cases = 1,458 Controls = 1,556	Shanghai, China	OR 9.94 4.63 3.25 2.08	(1.20-82.37) (1.85-11.59) (1.11—9.53) (1.14-3.82)	Adjusted for known or suspected risk factors and occupational histories. Elevated risk found among postmenopausal women engaged in farming.
Electric and Magnetic Fields	Erren, 2001	Review 43 papers, pooled RRs for breast cancer among both men and women	Included 24 studies among women and 15 among men	Women, RR = 1.12	(1.09-1.15)	Probable misclassification of exposure and even disease. Risk estimates range from 0.6 to 1.64.
Electric and Magnetic Fields	Kheifets and Matkin, 1999	Review 35 studies				Literature review of both male and female occupational breast cancer

Exposure	Study, Type & First Author	Subjects	Exposure definition data source;	Effect size, range	95% Confidence Intervals	Comments
			Outcome measured			studies.
Solvents	Labreche & Goldberg, 1997	Hypothesis regarding solvent exposure and breast cancer risk.				Different perspective from Davis et al, with regards to endocrine disrupters.
Cigarette Smoke	Band et al., 2002	1431 women with breast cancer utilising Premenopausal cases = 318, controls = 340; Postmenopausal cases = 700, controls = 685	British Columbia cancer registry, 1988-1989	OR 1.6	(1.13-2.51)	Premenopausal women who smoked within 5 years of menarche; Nulliparous women who smoked 20 or more pack years; Postmenopausal women whose BMI increased and started smoking after first full term pregnancy

Appendix G: Table 5.3: Breast cancer and epidemiological studies - white collar-type occupations

study design, subjects, effect size, confidence intervals (listed in order of study's statistical power)

OR = odds ratio; PMR = proportionate mortality ratio, PCMR = proportionate cancer mortality rate, RR = rate ratio, SIR=standardized incidence ratio, SMR=standardized mortality ratio, MOR=mortality odds ratio

Bolded text indicates statistically significant data

Occupation	Study, Type & First Author	Subjects	Exposure definition data source; Outcome measured	Effect size, (n)	95% Confidence Intervals	Comments
REGISTRY-BASED						
White Collar	Calle et al., 1982	Mortality study Deaths = 1,780 Involved 563,395 women United States 1982-1991	Administrative Executive	RR = 1.14 RR = 1.93	(1.01-1.31) (1.03-3.62)	Based on occupational baseline questionnaires, asking current occupation, and next job held longest; controlled for some confounders
Telephone Industry	Coogan et al., 1996	Four US states cancer tumour registries. Cases = 6,888 Controls = 9,529	Admin. Supp. Positions, including clerical	OR = 1.15	(1.06-1.24)	Based on 14 broad occupational groups and 12 subgroups. "Most important duty". Controlled for breast cancer risk factors.
Teachers	Dosemeci and Blair, 1994	24 U.S. States (1984-89) 2444 cancer deaths	Women employed in Telephone Industry	White Women 20-49 years, MOR =1.6 50-69 years, MOR =1.5	(1.2-2.1) (1.3-1.8)	Possible exposure to new instruments, machinery or production procedures may account for excess risk.
	Robinson CF,	28 U.S. States	Mortality Proportion.	Black Women 20-49 years, MOR=2.1 50-69 years, MOR=2.5 Teachers, PCMR=132	(1.3-3.2) (1.4-4.5) (129-135)	

Occupation	Study, Type & First Author	Subjects	Exposure definition data source; Outcome measured	Effect size, (n)	95% Confidence Intervals	Comments
	and Walker JT. 1999	1984-95	Can. Mort. Ratios (PCMR)	Secretary, PCMR=114	(111-116)	
Electrical Equipment Industry & Printing and Publishing	Aronson and Howe 1994	2,995 cancer deaths 1965-79	10% Labour study based on 242,196 females working between 1965-1971	SMR 235	(107-445)	
				218	(109-391)	

Appendix H: Table 5.4: Breast cancer and epidemiological studies - nursing

Occupation, study design, subjects, effect size, confidence intervals (listed in order of study's statistical power)

OR = odds ratio; PMR = proportionate mortality ratio, RR = rate ratio, SIR=standardized incidence ratio, SMR=standardized mortality ratio

Bolded text indicates statistically significant data

Occupation	Study, Type & First Author	Subjects	Exposure definition data source;	Outcome measured	Effect size, (n)	95% Confidence Intervals	Comments
					p trend if any		
NURSE	Registry-based						
	Petralia et al. 1999	Not given	Occupation from death certificate (reported by next-of-kin);	Occupation from death certificate;	OR White:1.2 (2,342) Black:1.3 (234)	1.1-1.2 1.0-1.5	Possible confounders not addressed.
	Rubin et al. 1993	24 US States; 1984-93	Breast cancer mortality	Breast cancer mortality	PMR White:109 (1,635) Black:125 (177)	104-114 107-144	
	Peipins et al. 1997	25 US states; 1979-1987	Occupation from death certificate;	Occupation from death certificate;	PMR Vs. all workers: <65 yrs:111 (1,393) >65 yrs:108 (1,247)	106-116 102-114	
		50,000 decedent nurses	Breast cancer mortality	Breast cancer mortality	Vs. white-collar workers: <65 yrs:86 (1,393) >65 yrs:86(1,247)	82-90 81-91	

Occupation	Study, Type & First Author	Subjects	Exposure definition data source; Outcome measured	Effect size, (n)	95% Confidence Intervals	Comments
				p trend if any		
	REGISTRY-BASED (CONT'D)					
	Rix & Lange 1996	75,052 female healthcare workers Denmark 1970-1987	Occupation from occupational mortality register; Breast cancer incidence	SIR hospital: 1.19 (441) other: 1.25 (220)	1.08-1.3 1.09-1.43	reference group was all economically active persons
Nurse (cont'd)	Sankila et al. 1990	16,806 all type-cancers in women Finland 1971-1980	Occupation from occupational mortality register; Breast cancer incidence	SIR RN: 196 (163) Psych nurse: 123 (24) CHILD'S NURSE: 180 (33)	167-228 79-183 124-253	-possible confounders not addressed
	Morton 1995	7,368 breast ca cases 2,357 breast ca deaths	Occupation from census records; Breast cancer incidence	<u>SIR rate (per 100,000)</u> 166.8 (141) SMRate 43.7 (37)		-possible confounders not addressed
				0.01 < p < 0.05 significance of difference from rate for all women		

Occupation	Study, Type & First Author	Subjects	Exposure definition data source; Outcome measured	Effect size, (n) p trend if any	95% Confidence Intervals	Comments
	Petralia et al. 1998	All incident cancer cases aged 30+ Shanghai 1980-84	Occupation at time of dx or retirement, obtained from patient or next-of-kin; Breast cancer incidence	SIR 1.9 (53)	1.4-2.5	
	Cohort					
	Pollan and Gustavsson 1999	1,101,669 women 29,284 cases Sweden 1971-89	Occupation by census; Breast cancer incidence	SIR 117 (754)	109-126	-19 year follow-up -intragroup comparison within "professional occupations" attenuated risk, except for pharmacist
Nurse (cont'd)	Calle et al. 1998	563,395 women 1,780 breast ca deaths 50 US states 1982-1991	Occupation by baseline questionnaire on current occupation and other job held for longest time; Breast cancer mortality	RR 0.84 (85)	0.67-1.07	-prospective cohort -adjusted for race, family hx, benign breast dz, BMI, livebirths, age at 1 st birth, menarche, menopause, OCP, HRT, education, exercise, smoking, EtOH -reference group: housewives

Occupation	Study, Type & First Author	Subjects	Exposure definition data source; Outcome measured	Effect size, (n)	95% Confidence Intervals	Comments
	Gunnarsdottir and Rafnsson 1995	2,159 nurses Iceland 1920-1979	Nursing by nurses association database; Breast cancer incidence	SIR 1.16 (36)	0.81-1.61	-retrospective cohort -reference group: all women -no dose response found when employment time taken into account -prospective cohort - adjusted for age, age at menarche, parity, age at first birth, menopausal status, BMI, fam hx, HRT.
	Schernhammer et al. 2001	78,562 RN's 30-55 yrs of age United States 1988-98	Self-administered questionnaires; how many yrs worked rotating night shifts at least 3nights/month	RR Years on rotating night shifts: Never 1.0 (925) 1-14 1.08 (1,324) 15-29 1.08 (134) >30 .36 (58)	(0.99-1.18) (0.90-1.30) (1.04-1.78)	
Nurse (cont'd)	CASE-CONTROL Coogan et al. 1996	6,888 cases 9,529 controls 4 US states 1988-91	Occupation by telephone interview; Breast cancer incidence	OR 0.87 (323)	0.74-1.01	-adjusted for age, state, BMI, benign breast dz, fam hx, menopausal status, age at menarche, parity, age at first birth, lactation, education, EtOH -simple OR's almost identical to multivariate OR's. Perhaps confounders do not bias the estimates.

Occupation	Study, Type & First Author	Subjects	Exposure definition data source; Outcome measured	Effect size, (n)	95% Confidence Intervals	Comments
	Band et al. 2000	1018 cases 1020 controls	Occupation by self-administered questionnaire; Breast ca incidence	OR Pre-menopausal 0.71 (34)	0.47-1.07†	-ever occupation data presented in this table, usual occupation data similar -significantly increased risk among post-menopausal women -adjusted for possible confounders
	Habel et al. 1995	537 cases 492 controls Washington state 1980-90	Occupation by in-person interview; Breast ca incidence	Post-menopausal 1.37 (83) RR 1.2 (40)	1.01-1.85† 0.7-2.0	-adjusted for age, parity, education, EtOH -age-adjusted RR's almost identical to multivariate adjusted RRs

Occupation	Study, Type & First Author	Subjects	Exposure definition data source; Outcome measured	Effect size, (n) p trend if any	95% Confidence Intervals	Comments
Nurse (cont'd)	CASE-CONTROL (CONT'D)					
	Gunnarsdottir et al. 1997	55 cases 116 referents	Nursing by registration with nurses' association; Breast cancer incidence	OR Main occ.: 0.82 (41) FT work : 1.16 (38) OR of significant elevation was revealed only when study population was separated into groups according to their specialty	0.34-2.01 0.50-2.67	-97% response rate -adjusted for age, fam hx, marital status, nulliparity -adjustment for possible confounders did not change ORs substantially
	Petralia et al. 1999	301 cases 316 controls premenopausal women NY State 1986-1991	Occupation by personal interview; Breast cancer incidence	OR 0.85 (24)	0.45-1.61	-adjusted for age at menarche, benign breast dz, fam hx, age, education, age at first birth -adjusted OR did not differ from crude OR
	Zheng et al., 2002	608 breast ca cases 609 controls Connecticut 1994-1997	Occupation by personal interview; Breast cancer incidence	OR 0.9 (24)	0.5-1.6	-low response rate: 66% eligible cases, 62% controls -occupation longest duration -adjusted for age, BMI, lifetime lactation, age at menarche, age at first full-term pregnancy, family breast ca hx, fat intake, race, income, study site

Occupation	Study, Type & First Author	Subjects	Exposure definition data source; Outcome measured	Effect size, (n) p trend if any	95% Confidence Intervals	Comments
Nursing Attendant	Case-Control Band et al. † 2000	See Above	See Above	OR PreMeno: 0.37 (5) Postmeno: 0.84 (15)	0.15-0.92† 0.45-1.55†	See Above
Nursing Assistant	Band et al. † 2000	See Above	See Above	OR PreMeno: 0.87 (6) Postmeno: 1.67 (10)	0.33-2.13† 0.73-3.84†	See Above

† 90% C.I. for Band et al., 2000 study

Appendix I: Table 5.5: Breast cancer and epidemiological studies - laboratory technicians
 study design, subjects, effect size, confidence intervals (listed in order of study's statistical power)
 OR = odds ratio; PMR = proportionate mortality ratio, RR = rate ratio, SIR=standardized incidence ratio, SMR=standardized mortality ratio
 Bolded text indicates statistically significant data

Occupation	Study, Type & First Author	Subjects	Exposure definition data source; Outcome measured	Effect size, (n) p trend if any	95% Confidence Intervals	Comments
LABORATORY WORKERS	CASE CONTROL					
	Belli et al, 1992	Mortality men= 1797 Mortality women= 685 Italian National Institute of Health	Incident study	Elevated breast cancer but no specific ORs		
	REGISTRY-BASED					
Health & Science Technicians	Burnett et al., 1999	Proportionate Cancer Mortality ratios (PCMRs) Male-Female Cancer Deaths = 2,109 Total Deaths = 5,835		Ages 18-64 PCMR = 114 Total Age Group PCMR 112	CI 95% (100-130) (100-125)	Radiologic and science technicians did not have a statistically significant elevated breast cancer risk

Appendix J:

Description and Analysis of Different Elevated Cancers

L.1: Health Canada Data: Cancers of the Lip, Oral Cavity, and Pharynx (ICD-9: 140-149)

Figure 5.3: Cancer of the Lip, Oral Cavity and Pharynx Mortality Rate Windsor, Ontario



Compiled from Health Canada data 1986-1992

The mortality rates were elevated among men (54% higher, 32 excess deaths) and more than 2 times higher for women (15 excess deaths) in the age group of 45-75 years of age. Hamilton incidences and mortality rates were not statistically significantly lower than the Ontario rate. One exception, however, was among Hamilton males between 45-74 years of age. Their incidence rate was 12% below the rest of the province. (See Figure 5.3.)

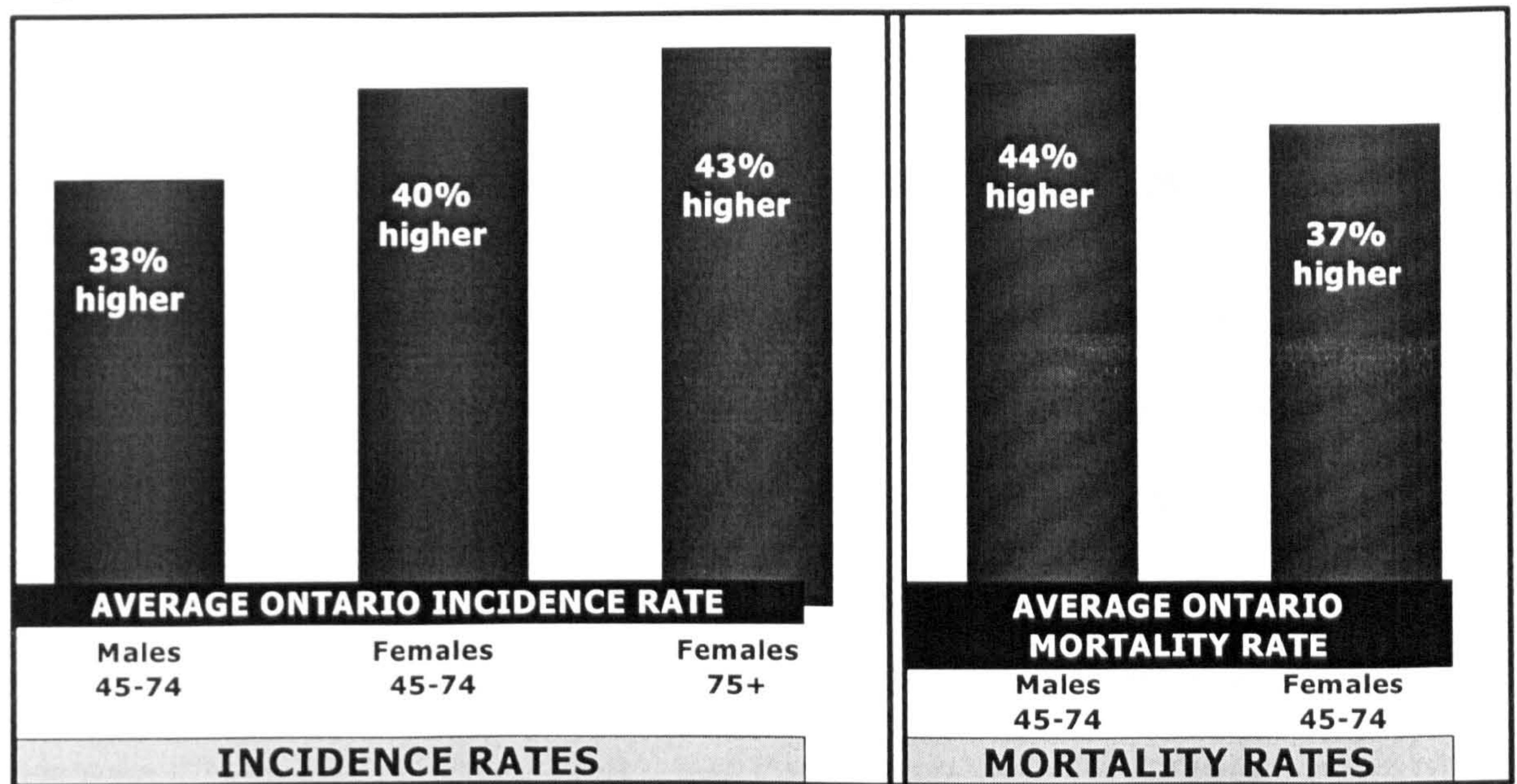
Cancers of the lip, oral cavity and pharynx are also particularly associated with tobacco, and alcohol use. These risk factors were not controlled for in this data set, but the District Health Council (1995) reports that the tobacco and alcohol use is approximately the same as the rest of the province. Further studies would be needed to examine other potential risk factors (more below of this topic).

L. 2: Health Canada Data: Cancers of Digestive Organs and Peritoneum (ICD-9:150-159)

This group of cancers included neoplasms of the esophagus, stomach, colon and rectum, liver and intrahepatic bile ducts, gall bladder and extrahepatic bile ducts, and pancreas. Among this class of cancers, there was a 10% higher mortality rate among Windsor males than the rest of Ontario, particularly among those males 45-74 years of age. Colorectal cancer was responsible for about 48 excess deaths, while the comparable age group in Hamilton was 12% below the Ontario rate.

Gerhardsson de Verdier et al (1992) cite a number of occupational risk factors associated with elevated colorectal cancer risk including exposure to soot, asbestos, cutting fluids and oils, and combustion gases from coal, coke and wood. The potential risk posed by oil mist represents a serious concern given the propensity of its use in the auto manufacturing industry and was the subject of a report by the Ontario Occupational Disease Panel (1997).

Figure 5.4: Rates of Pancreatic Cancer: Windsor, Ontario



Compiled from Health Canada data 1986-1992

The study reported elevated incidence and mortality of pancreatic cancer. Among men there was an increased incidence (33% higher, 21 excess cases) and a 44% higher (42 extra deaths) mortality in the 45-74 age group. Women had a 40% elevated incidence rate (20 extra cases) and 37% higher mortality (36 extra cases). For women older than 75 this increase persisted with a 43% higher incidence rate than the rest of Ontario.

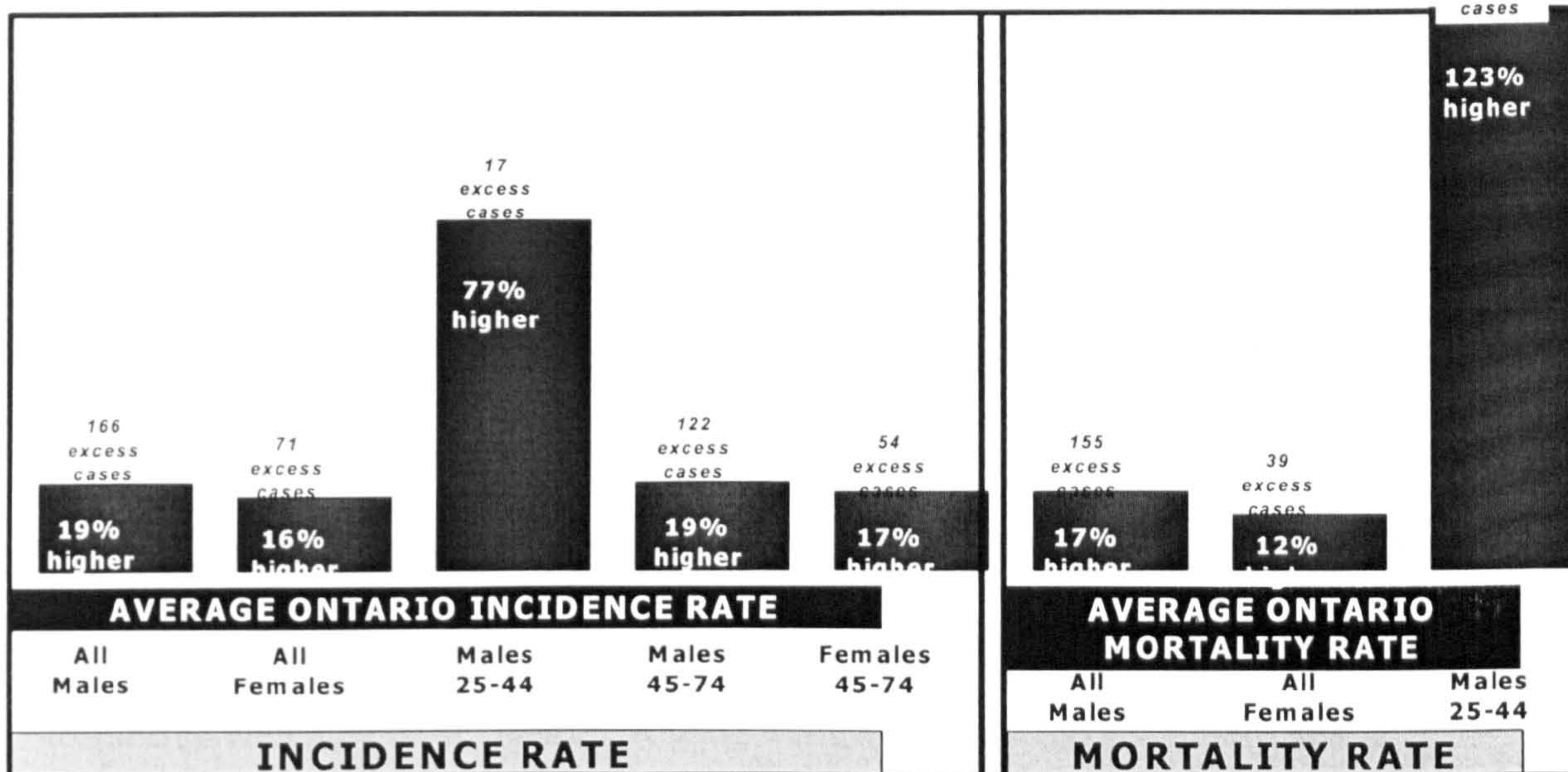
Pancreatic cancer is a highly fatal malignancy with largely unknown etiology. In 2000, pancreatic cancer was the 12th most common cancer among men and women in Canada with 3100 new incident cases (Brophy, 2001). While smoking, diabetes, chronic pancreatitis, and high-fat diets (Weiderpass et al, 1998) seem to increase the risk, there is medical literature that suggests that occupation and exposure to polycyclic aromatic hydrocarbons (PAH), aromatic amines, solvents and silica may

be additional risk factors (Ahlegren and Macdonald, 1992; Hansen, 1991; Kauppinen et al, 1995; Kernan et al, 1999; Ojajarvi et al, 2000).

L:3: Health Canada Data: Cancers of the Respiratory and Intrathoracic Organs (ICD-9:160-165)

Consistent with the previously reported health studies of the Windsor area, the Health Canada report found increased incidence rates and mortality from respiratory and intrathoracic cancers. In a previous study, for example, Windsor men and women both ranked fourth out of 25 Canadian census metropolitan areas for mortality from lung cancer (Gilmour and Gentleman, 1999). The mortality rates for men were 17% higher (115 excess deaths) than the provincial rate. Of particular concern was the more than 2-fold elevation (123%, 14 deaths) respiratory cancer among 25-44 year olds. The mortality rate for Windsor female was 12% higher (39 excess deaths). The incidence rates were similarly elevated and due to the low survivability of this particular type of cancer, incidence and mortality figures tend to be almost the same. In contrast, the incidence rates for lung cancer among Hamilton men and women were indistinguishable from the Ontario rates.

Figure 5.5: Rates of Lung Cancer Windsor,



Compiled from Health Canada data 1986-1992

Motta (1994) was cited by Health Canada for possible

lung cancer risks including mainstream and secondary-stream tobacco smoke, radon, asbestos, formaldehyde, end products of uncontrolled combustion, air pollution, and occupational exposures to a variety of substances.

L.4: Health Canada Data: Cancers of the Genitourinary Organs (ICD-9: 179-189)

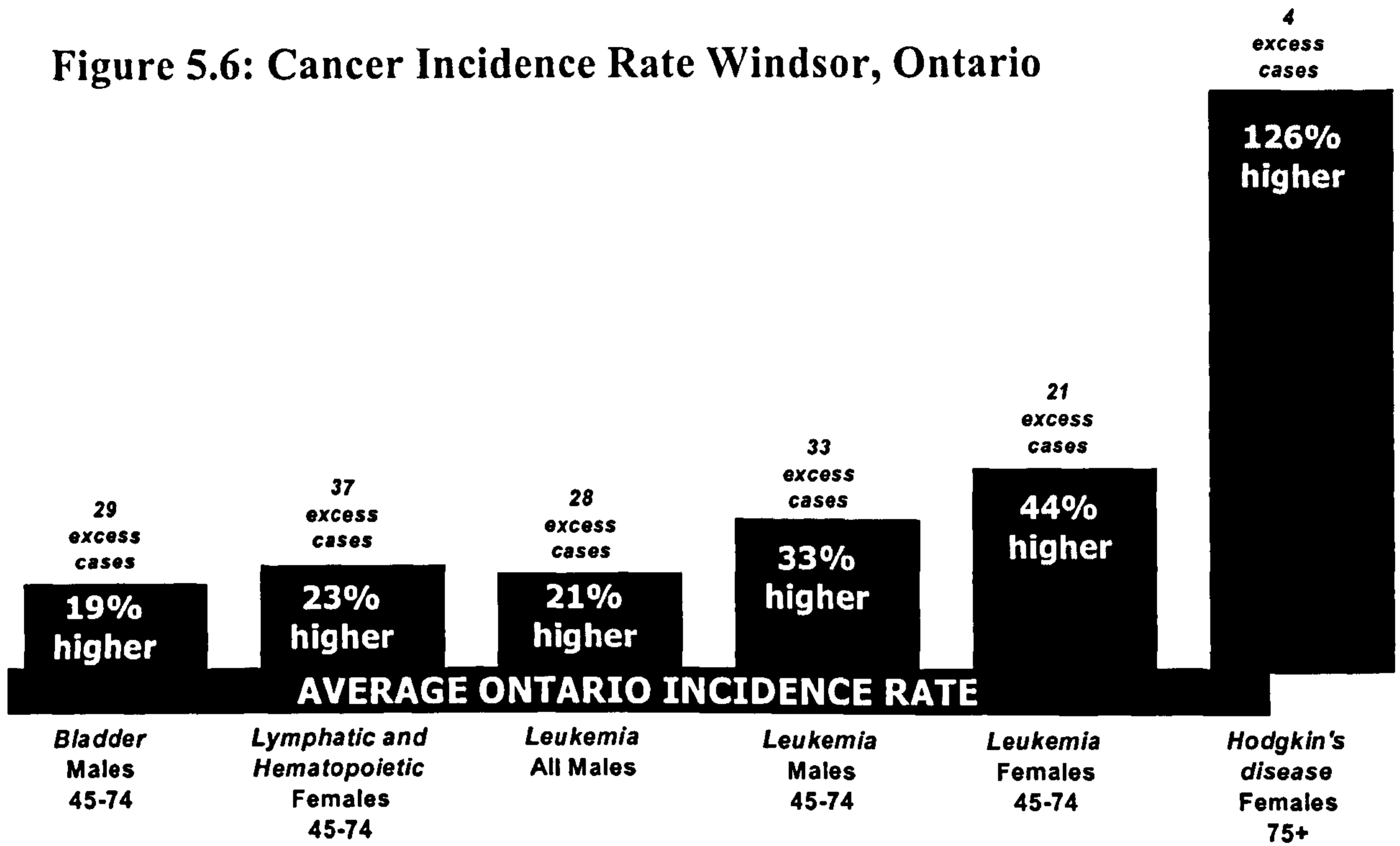
Health Canada chose the following cancers of the genitourinary system as potentially linked to pollutants: cancers of the ovary, prostate, testis, bladder, kidney and other urinary tract organs. For Windsor men, in the 45-74 age groups, there was a statistically significant 19% elevated incidence (29 excess cases). It is estimated that, among men, 25% of all bladder cancer may be occupationally related (Tola, 1980; Vineis et al, 1997). Before the Ontario Workers Safety and Insurance Board (WSIB) (Brophy, 1999), it was argued, on behalf of foundry workers that there was evidence of association between polycyclic aromatic hydrocarbons (PAHs), aromatic amines and bladder cancer risk (Risch et al, 1988; Steenland et al, 1987; Hansen, 1992; Vineis and Pirastu, 1997; Pirastu et al, 1996; Mallin, 1998).

L.5: Health Canada Data: Cancers of the Lymphatic and Haematopoietic Tissues (ICD-9: 200-208)

Leukaemia, non-Hodgkin's lymphoma, and Hodgkin's lymphoma were cited by Health Canada as potentially associated with exogenous toxic exposures. The incidences of these cancers were 23 % higher (37 excess cases) than the provincial rate. In the 45-74 age groups, the incident rate from leukaemia was elevated in both males (33% higher, 24 extra cases) and females (44% higher, 21 extra cases) when compared with the rest of Ontario. Among women 75 years and older there was over a 2-fold excess incidence of Hodgkin's disease. There was a 2-fold (2.26 times, 12 deaths) excess morbidity attributable to Hodgkin's disease in females compared to the rest of the province.

Occupational and environmental benzene exposure may be a causal factor in these elevated rates. Benzene is a universally recognised human carcinogen associated with haematopoietic disease and malignancies (Hayes et al, 1997; Savitz and Andrews, 1997; Infante et al., 1977a, 1977b, 1988, 1990; Infante, 1987, 1995a, 1997; IARC, 1987, 1982). In 1994 the Windsor Air Quality Committee identified benzene as a serious environmental pollutant emitting almost 4 million kilograms per year into the Windsor air shed with 97% originating from the Detroit area.

Figure 5.6: Cancer Incidence Rate Windsor, Ontario



Compiled from Health Canada data 1986-1992

Appendix K: Endocrine Disorders

M.1: Health Canada Data: Disorders of the Thyroid Gland (ICD -9:240-246)

In the Windsor Area of Concern there was a twenty four (24) percent increase of hospitalisations among women in comparison to the provincial average. Among the younger age group of females ages between birth and 24 there was more than two fold excess compared to the Ontario population (p.833). There are several effects of even mild lowering of the thyroid levels in terms of embryo and foetal development, particularly in terms of irreversible effects on brain development with consequences for learning and behaviour (Colborn et al., 1998).

M.2: Health Canada Data: Diseases of Other Endocrine Glands (ICD-9: 250-259)

Incidence of diseases of other endocrine glands was elevated in both males (41% higher, 625 excess cases) and females (41% higher, 735 excess cases) compared to the rest of Ontario. Of particular concern is the elevated incidence of *Diabetes Mellitus (ICD-9: 250)*. Among Windsor males there was a 44% excess (604 cases) and among females a 41% excess (637) cases. There was 58% excess (112 cases) and 41% excess for females (94 cases) between birth and 24 years of age. The elevated incidence of diabetes was also seen among Windsor men 25 to 44 years of age (51% higher) and among females (59% higher) than the Ontario population. Although hereditary and immune-mediated factors contribute to risk of diabetes, environmental pollutants, such as dioxin, can interfere with the normal functioning of the pancreas, thus initiating disease (Longnecker and Michalek , 2000).

The rate of *Ovarian Dysfunction (ICD-9: 256)*, related to diseases of the endocrine system, was more than twice (2.12 times, 30 excess cases). Again, there was a statistically significant elevated rate among females 24 and younger that was 96% higher than the provincial rate and over twice the expected among females 25-44 years of age.

M.3: Health Canada Data: Diseases of the Genitourinary System (ICD-9: 580-628).

Health Canada classified genitourinary system diseases as having possible associations with environmental pollutants. Among Windsor males there was a 40% higher than expected rate of *diseases of the male genital organs* with 1,582 excess cases. There was a 55% elevation of male infertility (41 cases). For Windsor men (7 cases) under 25 years of age male infertility was nearly seven-fold higher than the Ontario population.

For Windsor men there was a 44 % excess of *disorders of the breast* above the provincial rate. For females there was a 30% higher rate of disorders of the breast representing 302 excess cases. Both pesticides and heavy metals are suspected aetiologic agents of male and female genital tract disorders (Elinder, 1992; Copeland, 1993).

M.4: Health Canada Data: Congenital Anomalies and Infant Mortality (ICD-9: 740-758).

Exposures to endocrine disrupters prenatally can play a role in congenital anomalies and other adverse health outcomes in the offspring (Flower et al., 2003). The data on congenital anomalies was quite striking. In the period of 1986 to 1992 there

were 13,196 females born in the Windsor area. Within the first year there were 779 female babies diagnosed with some kind of anomaly. This represented a 25% higher rate (156 excess cases) than the rest of the Ontario population. Anomalous female births included: 13 cases of anencephaly (underdeveloped brains), which represent a three-fold excess; 149 cases of heart defects, which was 56% higher than expected; 95 cases of clubfoot, which was 69% higher; 10 cases of limb reductions, which represented over a two-fold excess compared to the rest of the Ontario population. There was also a 24% excess mortality among female babies born in Windsor.

During this same period 13,950 boys were born, and 885 had diagnosed anomalies (13% higher than expected, 101 excess cases). Anomalous male births included: 24 cases of congenital hydrocephaly, which was 88% higher than the expected rate; 172 cases of congenital heart defects, which is 65% higher, 68 excess cases); and 89 cases of clubfoot, which represented a 36% higher rate.

The Windsor Public Health Unit (2000) reported that the rates of male and female congenital birth anomalies continued to be elevated when examined in 1998. There was an elevated rate among Windsor-Essex County infants of 27% higher than the rest of the Ontario population among females and 13% among male infants. Congenital heart defects remained at 56% higher than the expected rate.

Anencephaly has been shown to be related to male parental exposure to solvents (Brender and Suarez, 1990). Parental exposure to benzene has likewise been associated with elevated risk of hydrocephaly in their offspring (Louik and Mitchell,

1992). Occupational exposure to benzene and organic solvents has been demonstrated to increase the risk of defects of the foetal heart (Holmberg and Nurminen, 1980; Sever, 1994). There is no registry that would attempt to capture parental exposures of children borne with such deformities.

Appendix L: CROME questionnaire

OCCUPATIONAL HISTORY QUESTIONNAIRE

IDN: _____

I. Personal Information

First Name: _____	
Last Name: _____	
Phone : (____) _____ - _____	
Birthday : _____ \ _____ \ 19 MM DD YY	Sex : Male <input type="checkbox"/> Female <input type="checkbox"/>
What is your native language? _____	
What other languages do you speak and write? _____	
Today's date _____ \ _____ \ 19 MM DD YY	

II. Instructions

- i) It is important that we have as much information as possible about your work history. We have provided space for you to list up to 10 jobs that you may have held for one year or more. The first job should be the job you held for the longest time. Then fill in the information for other jobs starting with your most recent job and working backwards.
- ii) Exposure: If you can, please list those substances to which you have been most frequently exposed at work (e.g. cutting fluids, dust, solvents, fumes, metals, radiation, pesticides, paints, asphalt, etc.)
- iii) Type of Industry: Because there may be similar jobs in different industries it would be helpful to identify the industry as well as the job you performed. Enter the corresponding codes (11 to 26) under "Industry Type" for each job listed.

Code	Type of Industry	Code	Type of Industry	Code	Type of Industry
11	Agriculture or natural resources (mining, logging, fishing)	12	Manufacturing or factory or processing plant work (auto or other transport equipment, plastic, chemical, food, metal, wood, rubber, textile industry)	13	Transportation or storage or pipelines (transportation or delivery services, storage or handling, transportation equipment maintenance)
14	Construction industry	15	Communications (phone, TV, cable services, mail)	16	Other utilities (gas, water, electrical, waste disposal)
17	Sales or rentals (retail, wholesale, properties)	18	Office work (business, finance, professional and government)	19	Health, Education, or Research Services
20	Security Services (fire, police, armed forces)	21	Personal Services (hairstyles, laundry, household)	22	Accommodation or restaurant, food or beverage services
23	Repair and maintenance services	24	Art or cultural or recreational sport activities	25	Housework or raising a family
26	Other services				

Appendix L: CROME questionnaire

Job #1 Job Title _____

Plant/Department _____

Employer _____

Exposure _____

Type of Industry Code Year Began 19 Year Ended 19 Full time Shift work
 Part time Seasonal

Job #2 Job Title _____

Plant/Department _____

Employer _____

Exposure _____

Type of Industry Code Year Began 19 Year Ended 19 Full time Shift work
 Part time Seasonal

Job #3 Job Title _____

Plant/Department _____

Employer _____

Exposure _____

Type of Industry Code Year Began 19 Year Ended 19 Full time Shift work
 Part time Seasonal

Job #4 Job Title _____

Plant/Department _____

Employer _____

Exposure _____

Type of Industry Code Year Began 19 Year Ended 19 Full time Shift work
 Part time Seasonal

Job #5 Job Title _____

Plant/Department _____

Employer _____

Exposure _____

Type of Industry Code Year Began 19 Year Ended 19 Full time Shift work
 Part time Seasonal

Appendix L: CROME questionnaire

Job #6 Job Title _____

Plant/Department _____

Employer _____

Exposure _____

Type of Industry Code Year Began 19 Year Ended 19 Full time Shift work
 Part time Seasonal

Job #7 Job Title _____

Plant/Department _____

Employer _____

Exposure _____

Type of Industry Code Year Began 19 Year Ended 19 Full time Shift work
 Part time Seasonal

Job #8 Job Title _____

Plant/Department _____

Employer _____

Exposure _____

Type of Industry Code Year Began 19 Year Ended 19 Full time Shift work
 Part time Seasonal

Job #9 Job Title _____

Plant/Department _____

Employer _____

Exposure _____

Type of Industry Code Year Began 19 Year Ended 19 Full time Shift work
 Part time Seasonal

Job #10 Job Title _____

Plant/Department _____

Employer _____

Exposure _____

Type of Industry Code Year Began 19 Year Ended 19 Full time Shift work
 Part time Seasonal

III. The Questionnaire

1. About how long did it take you to complete the questionnaire?			
Less than 15 minutes	<input type="checkbox"/>	15 to 30 minutes	<input type="checkbox"/>
30 to 60 minutes	<input type="checkbox"/>	Over one hour	<input type="checkbox"/>
2. We would like to know whether you completed the questionnaire by yourself, with the help of someone else or did someone else complete it for you?			
Self	<input type="checkbox"/>		
Self and someone else	<input type="checkbox"/>		
Someone else	<input type="checkbox"/>		
3. Did you have any trouble answering any of the questions?			
No	<input type="checkbox"/>		
Yes, a little bit	<input type="checkbox"/>		
Yes, a great deal	<input type="checkbox"/>		
<u>Problems</u>			

AT THE SOURCE

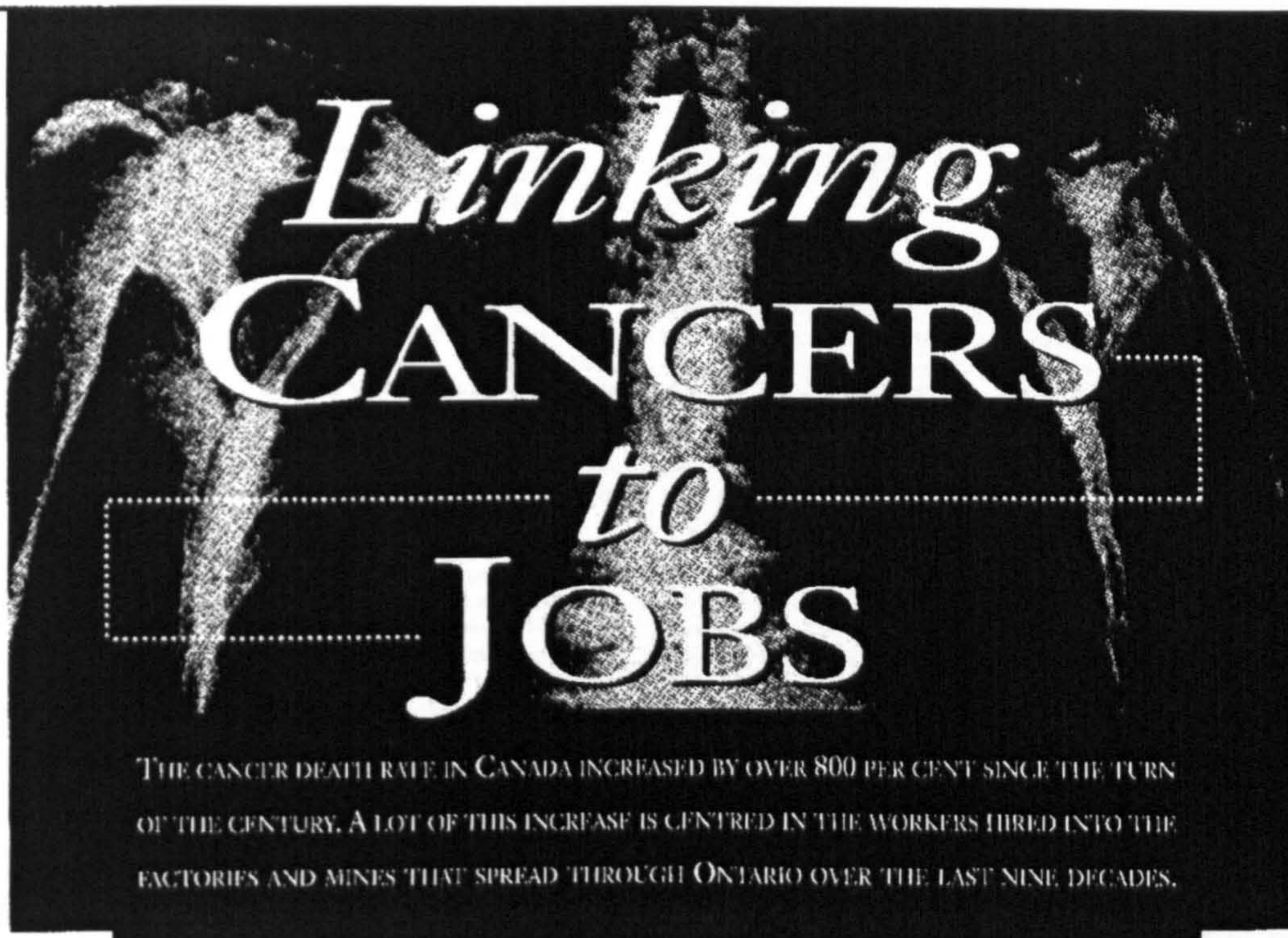
VOLUME 16 NO. 3 WINTER/SPRING '95/96

Linking CANCERS to JOBS

Agriculture or natural resources (mining, logging, fishing)	Transportation, storage or pipelines	Communications (e.g. phone, TV, cable services, mail)
Sales (retail, wholesale, properties) or rentals	Office work in business, finance, professional	Personal services (barber, laundry, household)
Security services (e.g. fire, police, armed forces)	Art, cultural, recreational or sports activities	Repair and maintenance services (e.g. janitor)
Housework or raising a family	Construction industry	Other utilities (e.g. gas, water, electric, waste disposal)
Healthcare, education, research or social services	Accommodation, restaurant, food or beverage services	Other services

START

Have you worked in any of the following industries or businesses?



START

"There is strong evidence that 'blue collar' workers, in particular, are bearing an excessive and disproportional cancer burden because of their exposures in the workplace," said Jim Brophy, executive director of the Windsor Occupational Health Clinic for Ontario Workers.

Brophy points to a study by the Public Health Unit and the District Health Council in Essex County, where Windsor is located. The study found that men in that county have a 15 per cent higher rate of lung cancer than the Ontario average, even though smoking rates and other individual lifestyle patterns are about the same.

The study looked at nine categories of diseases, and found that men were above average in seven, and women in six.

The Windsor Occupational Health Clinic is participating in a ground breaking research project that will uncover links between cancer and the occupational histo-

ries of the patients. Other project participants are the Occupational Disease Panel (ODP) of the Ontario Ministry of Labour, the Ontario Cancer Treatment and Research Foundation's Windsor clinic and three Canadian Auto Workers (CAW) local unions.

"If we can identify specific locations where clusters of the disease are centred," said Brophy, "we can take steps to eliminate exposure to the carcinogens that cause it."

Jason Tung, an occupational hygienist at the ODP, said the panel was interested in developing a mechanism to gather information on occupational diseases.

"Very few databases exist on workers' occupational histories," he said. "One that has proven useful is the mining master file, put together by the Ministry of Labour for hard rock miners. It examines miners' health in relation to silica exposure. We wanted to develop a similar source of data to track other diseases and other occupations."

Brophy sits on the Occupational Disease Panel. He initiated a series of meetings with doctors at the Windsor Cancer Clinic. The clinic's director, Dr. Erhan Laukkanen, was very supportive, Brophy said. "He was superb. He embraced the concept, and brought a lot of new ideas into it."

Laukkanen developed a database program he calls Computerized Recording of Occupations Made Easy (CROME). Using Lotus Approach software, cancer patients can readily enter information about every job they worked at for longer than one year.

IN ONTARIO,

more than 10,000 cases of cancer are diagnosed each year," said Laukkanen. "Although medical information on cancer patients is routinely captured and stored, there is no systematic method to collect occupation data. When these are coupled, it may be possible to uncover patterns of disease in specific work sites."

Brophy says that about half of all recognized carcinogens are found in the workplace environment.

The three organizations decided to cooperate on a pilot project to test the effectiveness of gathering this information electronically. Two communities, Windsor and Sudbury, were selected for the study. They each have relatively stable populations, and each has both an Occupational Health Clinic and an Ontario Cancer Treatment and Research Foundation clinic.

"This is a new way of gathering information," said Tung. "Traditionally, researchers relied on written questionnaires and personal interviews. Written questionnaires have a very low response rate, while interviews can be time consuming, expensive and inconvenient. The first phase of our project compares computer tracking with the older methods. If it is found to be more efficient, we can design a meaningful occupation data collection mechanism that can be used throughout Ontario."

This initial assessment will be based upon information gathered in the Windsor area.

Patients at the Windsor Regional Cancer Centre are asked to participate in all three data collection methods. When they are first diagnosed, they enter their job history information at a computer terminal in the clinic. They are then given a questionnaire to take home, fill out, and return. About 30 per cent of them will return a completed questionnaire, which the clinic will forward to the ODP.

These patients are then scheduled for an interview at the Occupational Health Clinic. Both the questionnaire and the interview are designed to get information about the patient's work history. The interview also probes deeper to uncover information about the substances the patient was exposed to at work.

THE ODP still needs information from more cancer patients in order to have a sample group large enough to produce meaningful conclusions. Brophy thinks that an unfamiliarity with computers may be slowing the project down.

"We found that older patients don't even like to use bank teller machines," he said. "In many cases, a staff member at the clinic had to sit with them and help enter data into the computers. Cancer is a dramatic disease, and newly diagnosed patients want to talk to someone about it. Data entry often turned into an informal counselling session."

To help overcome patient reluctance, Brophy turned to a pool of sympathetic volunteers. A group of retired CAW members are learning the software to help guide users through it.

Although the computer program was complicated to develop, it has been made as "user friendly" as possible. It incorporates a series of clear yes or no questions, and touch-screen technology eliminates the need to type anything on the keyboard.

The database contains about 3500 different job classifications, all of which are coded with the standard industry codes and standard occupation codes (SIC/SOC)

used by Statistics Canada.

"It was very much a joint effort," said Tung. "Dr.

Laukkanen was instrumental in developing the software. We structured the screen layers, merged the SIC and SOC codes, and coded all the individual job classifications. We all spent a lot of time modifying and simplifying the program."

CAW representatives from the three major auto manufacturers in Windsor helped with this part of the program's design.

"Early last year, Jim Brophy asked us to be a part of a committee to put together the program," said Pat Dugal, the CAW national coordinator of health and safety in the Ford chain. "Our role was to give a complete list of all the job classifications within the automobile industry."

Brophy thinks Dugal is being too modest. "The CAW really shaped what the screens look like and made sure the software reflected the way auto workers see themselves," he said. "Without their participation, this would never have got off the ground."

After entering some personal information such as name, sex and date of birth, patients are asked to identify every job at which they worked for more than a year. Using the program's "Multi-levelled Job Selection Process," patients first select an industry type from a list of 16. There are graphical depictions of each general industry group, one of which identifies time spent in the home raising a family. Each choice opens up a subsequent level of choices, which eventually end with a specific job.

For example, choosing "manufacturing" at the first level presents a choice of specific types of manufacturing. Among these is "auto or other transport equipment production." This leads to a set of choices which includes auto or truck manufacturing. Then the patient identifies whether this was in an assembly plant, a foundry, an engine plant, a trim plant or a transmission plant. After that, the type of job, such as production, skilled trade, supervision, etc. is chosen. Then a specific job classification within the job type is identified. Patients then enter the

age at which they started the job, and the length of time they worked at it.

AT FIRST, the project will receive information only from people who have been newly diagnosed with cancer. Laukkanen says this is a "logistical" response to start-up problems. He hopes that when the system is proven effective, it can be expanded to include returning patients.

"Our first objective is to look at new cancer cases in Essex County," he said. "Many people here belong to occupational groups for which an association with cancer already exists. We want to identify these occupations in our patients. We want to put occupational histories into the broad context of what is known about cancer in our area."

"The long-term goal is to relate cancer, and other diseases, to specific occupations and exposures," said Tung. "We hope to eventually incorporate the software as part of the treatment process in hospitals and doctors' offices. Then it can be used to track any disease."

If it is successful, a researcher will be able to enter the name of any disease, and produce a list of jobs common to all sufferers from it. Or they could enter the name of an occupation, and get a list of diseases associated with it.

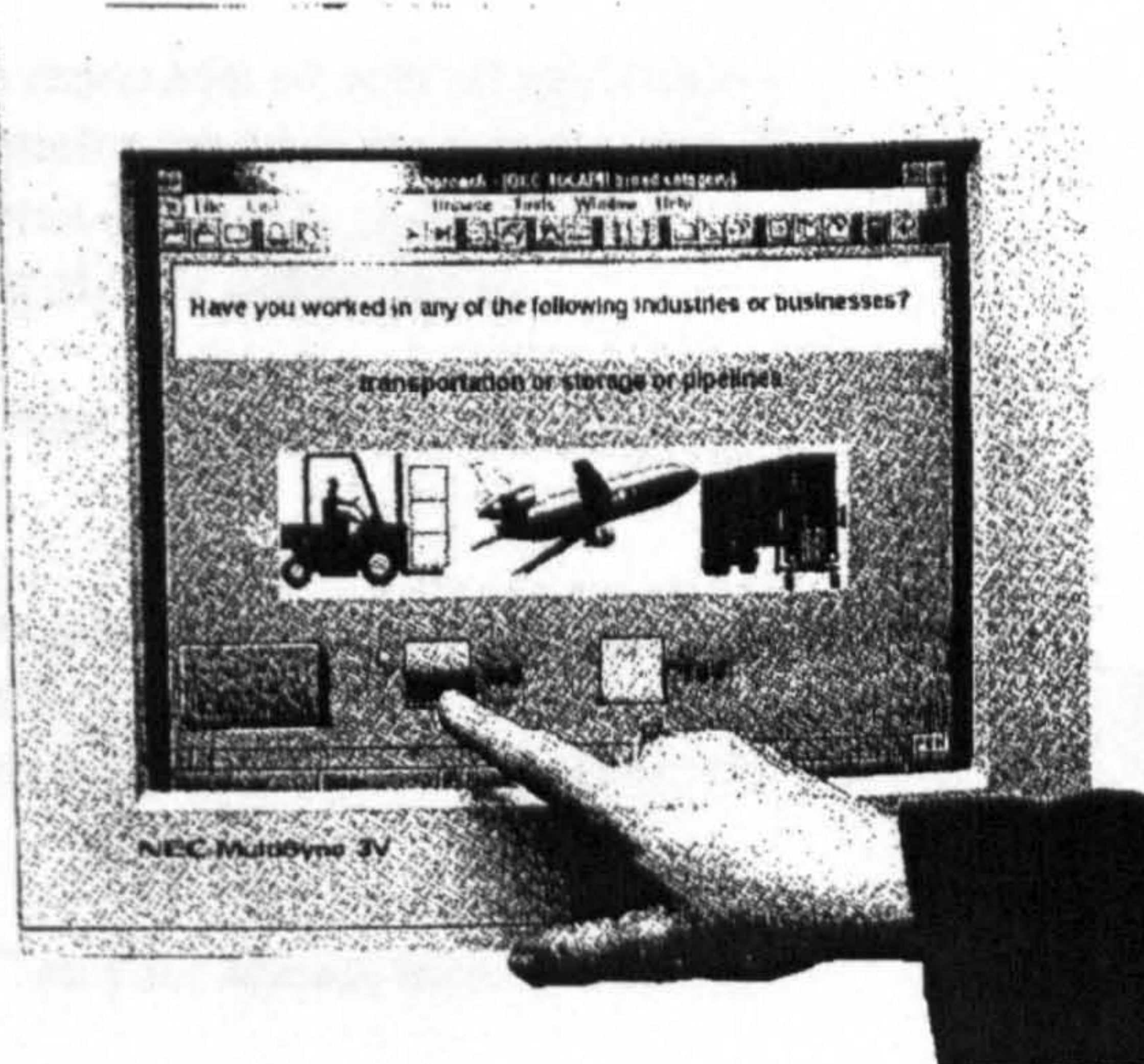
"This is a very important project," said Lissa Donner, coordinator of the Occupational Health Clinics for Ontario Workers. "For the first time, we will have information about the occupational history of every cancer patient in a specified region. It will help demonstrate the full extent of work-related cancers."

"It is also important to recognize that this has been largely a labour initiative," she continued. "Worker involvement in developing public health policy ensures that the right questions are asked, which is necessary if we are to get the right answers. Labour councils around the province will be encouraged to bring this project to their district health councils."

"Once patterns are identified and compared to patterns in the general population," said Laukkanen, "we can investigate specific work categories and attempt to identify and remove the cause of the disease."

Brophy also hopes this project will help to eliminate cancers before they begin. "The public health perspective, long advocated by labour, to develop a preventive strategy rather than rely on treatment and the search for a 'cure,'" he said, "is gaining increased support within medical, scientific and government organizations."

SAVE



INDUSTRY/JOB SELECTION GUIDELINES

The following are useful hints for selecting industries and jobs as you work through the computer program. There will be on-screen instructions to assist you, but it will be most helpful if you could also read the following guidelines carefully before you start. Please also refer to the Help Manual for clarifications and examples.

1. Read the instructions carefully and review all of the choices before making any selection.

Selecting your employment history

1. Think of your employment as an industry before a job (i.e. the nature of the business of your employer or company).
2. Identify as many jobs in your work history as you can.
3. Refer to the list of all industrial sectors (beside this poster) to make sure you select the most suitable match to your employment.
4. Jobs are sorted under broad categories. Select the one that is closest to the job you are looking for. (A flow chart is available on request to assist you in making your selections.)

Beginning the touch screen program

1. **Important:** Follow the screens one by one.
2. If a category appears on the screen which represents an area of employment you worked in, select it. This way your employment history is entered in the order in which it appears on the touch screen (do not try to enter your employment history according to the dates of your employment).
3. Only jobs (part-time or full-time) with at least one year duration should be included in your selections.
4. If you have worked in the same, or similar job, more than once, enter that job only once. Then, when calculating the amount of time worked in the job combine job length and mark the age when you were first employed in that job as the start date.
5. Unless you see "FOR MORE CHOICES" on your screen, there are no more choices. PRESS "DONE".

Appendix O: CROME informed consent



Occupational
Disease Panel

Comité des maladies
professionnelles

Ministry of Labour
69 Yonge Street, 10th Floor
Toronto ON M5E 1K3

Ministère du Travail
69, rue Yonge, 10^e étage
Toronto (ON) M5E 1K3

Telephone: (416) 327-4156
Facsimile: (416) 327-4166

Téléphone: (416) 327-4156
Télécopieur: (416) 327-4166

CONSENT TO USE PERSONAL INFORMATION FOR RESEARCH

Information collected on the attached questionnaire is collected under the authority of section 95 of the Workers' Compensation Act, R.S.O. 1990, c. W.11, which authorizes the Occupational Disease Panel, an agency of the Ontario Government, to investigate diseases that are thought to be associated with work. You may also be interviewed to discuss your occupational history further. This information collected may be used by the Panel in its research and investigations into whether particular diseases are associated with certain types of occupations.

By signing below, you have agreed to permit the Panel to use the information collected from both the questionnaire, and the interview for the Panel's research and investigations into the links between disease and work. You will also have agreed to permit the Panel to use information collected from you in the OCFRF database.

I, _____
(please print first and last name)

consent to permit the Occupational Disease Panel to use the following information about me for the purposes of research and investigations into associations between occupations and diseases.

Signed,

name

date

If you have any questions, please contact Jason Tung, Researcher, at the Occupational Disease Panel, 69 Yonge Street, Suite 1004, Toronto, Ontario, M5E 1K3, phone (416) 327-4161

Appendix P: CROME questionnaire occupational history summary

Occupational History Summary



job description	age started	job length	G - Govt B - Both
19-Apr-199 first name any surname patient			12345678
1 auto & truck manufacturing, engine plant trade - welding or metalwork	21 to 30 years old 23	11 to 20 years	
2 non-production work			
3 chemical production other service	20 or younger 20	1 to 5 years 3	
4 other retail sales work	21 to 30 years old 23	1 to 5 years 1	
5 broker or financial agent	31 to 40 years old 36	1 to 5 years 1	
6 other government office worker	21 to 30 years old 30	6 to 10 years 7	G
7 research laboratory worker other service	21 to 30 years old 25	1 to 5 years 5	
8 other food preparation work	20 or younger 16	1 to 5 years 5	

Occupational Histories of Essex County Cancer Patients

Researchers: James Brophy, Kevin Gorey, Margaret Keith, Ethan Laukkanen, Deborah Hellyer

Sponsors: Occupational Health Clinics for Ontario Workers (OHCOW), Windsor Occupational Health Information Service (WOHIS), University of Windsor, Windsor Regional Cancer Centre (WRCC)

Background

Essex County, which has both an urban and rural population within a small land area in the Great Lakes Basin, manifests cancer incidence and mortality rates exceeding provincial averages. The 1995 Health Profile of Windsor and Essex County Residents indicated higher rates of lung, bladder and leukaemia in males and elevated rates of breast, lung and uterine cancers in females when compared to the rest of the province. This region affords an exceptional environment for studies that examine potential occupational risks for both industrial and agricultural settings. Notably, the out-migration rate of the Essex County population is the lowest among Ontario counties. In addition 95% of all cancers are treated locally at the WRCC. There is in Ontario no systematic collection of occupational histories linked with accurate medical diagnosis. As a result, there is currently no means by which the extent of occupationally related cancers in the province can be directly estimated or monitored.

Prior occupational research has been constrained by limited occupational histories obtained from death certificates or records indicating predominant occupation. In 1995 the WRCC, OHCOW, WOHIS and the former Ontario Occupational Disease Panel (ODP) launched a computer-based data collection tool to capture detailed chronological work histories of Essex County Cancer patients. A user-friendly program is used to gather chronological occupational data from 16 major industries and over 300 occupational categories. The database provides an exhaustive and detailed source of occupational history.

The information provided through the pilot phase of the project, along with additional information regarding social, nutritional and lifestyle factors from the WRCC records, produced extensive data and resulted in some provocative findings regarding pre-menopausal breast cancer and occupational farming history.

Pilot Study Findings

Table 1:
Logistic Regression Estimated Odds Ratio of the Ever Potentially Pesticide Exposed-Breast Cancer Associations

Estimates Adjusted for the Following Variables

Exposure	Age	Age and Education
	OR (95% CI)	OR (95% CI)
Ever Farmed		
All Ages	1.34 (0.81, 2.34)	1.38 (0.67, 2.83)
55 or younger	2.57 (0.75, 8.85)	9.95 (1.06, 77.43)
Fifty-six or older	1.18 (0.65, 2.13)	0.88 (0.44, 1.92)
Ever Farmed or Processed Feed		
All Ages	1.25 (0.79, 1.98)	1.37 (0.73, 2.58)
55 or younger	1.52 (0.57, 4.07)	14.36 (1.69, 122.33)
55 or older	1.21 (0.71, 2.05)	0.81 (0.39, 1.68)

Total sample analyses included 536 valid cases, those of younger women had 150 cases, and education-adjusted analyses of younger women included 89 cases.

Purpose & Objectives

The purpose of this next phase of the research project is to more fully examine the potential occupational risks of breast cancer among women and of upper air-ways cancers among men and women. A further objective of this project is to fully integrate occupational histories into the general data collection of cancer patients being treated at the WRCC. It is our goal to have all new patients with cancer added to the database. Efforts will be made to extend the project to other cancer centres in Southwestern Ontario. This project will also ameliorate the current version of the data-collection tool. The new database will be called Lifetime Occupational History Registry (LOHR).

Research Design

All incident cases of female breast and male and female laryngeal cancers diagnosed at the WRCC over the next two years will be asked to participate in the study. An experienced nurse/research assistant will guide participants to complete the LOHR questionnaire. Community controls will be randomly selected and will also be administered the LOHR questionnaire. Variability in age and residence will allow for the construction of efficient and statistically powerful logistic regression models.

The calculation of descriptive statistics among cases and controls including stratification and adjustment will use standard epidemiologic and biostatistical techniques. The two central logistic models will regress the key dependent variables on the key occupational independent variables adjusting for key confounders.



New Measures in LOHR

A number of new features will be added to the database. LOHR will continue to utilize "job" as a surrogate for exposure. It is presumed, for instance, that someone who worked as a welder in the auto industry was exposed to metal fumes. The list of industries and occupations has been expanded and utilizes the National Occupational Classification (NOC) codes and North American Industry Classification (NAIC) codes. There will be additional questions to capture pesticide exposure history including intensity, latency and duration.

This study not only will include a rich assessment of lifetime work histories, but also a more complete assessment of other potentially confounding, intervening or moderating factors. Other information to be collected includes diet, smoking, reproductive history, family history, socioeconomic status, and other environmental risk factors.

Funding for this project has been provided by the Workplace Safety and Insurance Board Research Advisory Council.

Questions Included in LOHR Questionnaire
(Breast and Head and Neck Cancer Patients and Community Controls)

1. What is your marital status? _____
 (married, single, widower, divorced, common-law, widow, separated, unknown)
2. Which best describes your highest education level? _____
 (some elementary school, completed elementary school, some high school, finished high school, some college or university, college graduate, university graduate, advanced degree - masters or doctorate)
3. How many people (adults and children) currently live in your household? _____
4. What was your household's members approximate total annual income from all sources before taxes, in the past 5 years? _____ (less than, \$20000, between \$20000 and \$40000, between \$40000 and \$50000, between \$50000 and \$60000, between \$60000 and \$75000, between \$75000 and \$100000, between \$100000 and \$150000 over \$150000)

HEIGHT AND WEIGHT

1. How tall are you? Height (feet):__ (inches):__
2. How much do you weigh now ? Weight (lb):_____ (weight in kg = _____ kg)
 Any change over past 2 years ? yes__ no__
 How much? increase ____ decrease_____ (lb)
3. What is the most you have ever weighed (lb) [don't include pregnancy]? _____

ALCOHOL USE

1. Pick statements which best describe your alcohol use: _____
 (never used alcohol, binge drinking, past user alcohol, alcohol dependence – current, occasional social alcohol use, alcohol dependence – reformed, current user alcohol, social problems related to alcohol, health problems related to alcohol, alcoholic liver disease)
2. Pick statement which best describes the amount of your alcohol use: _____
 <1 drink/month average, 1-3 drinks/month average, 1 drink/week average, 2-4 drinks/week average, 5-6 drinks/week average, 1 drink/day average, 2-3 drinks/day average, 4-5 drinks/day average, >6 drinks/day average

SMOKING

1. Have you smoked at least 100 cigarettes in your entire life? Yes ____ No _____
2. About how old were you when you first started smoking? _____
3. About how many years in total did you smoke? _____
4. How many cigarettes per day, on average, did you smoke? _____
- 4a. Check any other forms of tobacco which you have used regularly: _____.(cigar smoker, user of chewing tobacco, pipe smoker)

5. When you were a child, did your parent(s) or guardian smoke cigarettes in your presence? _____ (never, occasionally, regularly as a light smoker, regularly as a moderate smoker, regularly as heavy smoker)

6. When at work, did you share spaces with people who were smoking? _____
(little or no smoking on jobsite, smoking in rest areas some smoking on jobsite, regular heavy smoking on jobsite)

HORMONE RELATED

1. How old were you when you had your first menstrual period? _____

2. How old were you when you had your last menstrual period? _____

3. How did your menstrual periods stop? _____ (natural change of life, as a result of surgery, due to other cause)

4. Have you ever used birth control pills? _____

5. How old were you when you first used birth control pills? _____

6. How old were you when you last used birth control pills? _____

7. Have you ever been pregnant? _____

8. How many times have you been pregnant? _____

9. How old were you at the end of your first pregnancy? _____

10. How many pregnancies ended in live births? _____

11. For how many months in total have you breastfed? _____

12. Have you ever taken hormone replacement medication? _____

13. How old were you when you first used hormone replacement medication? _____

14. How old were you when you last used hormone replacement medication? _____

RESIDENCE HISTORY

1. Current residence area (postal code)? _____

2. How many years in this neighbourhood? _____

3. Ever lived on a farm or within a mile of a farm? _____

4. **Select any applicable statement:** _____ (lifelong resident of Essex County, came from elsewhere in Canada, came from outside Canada)
5. **Total years in Essex County?** _____
6. **Essex County areas of residence:** _____ (zone number as per real estate zone map, year started, year ended, notes)

MISCELLANEOUS

1. **Have you ever gardened as a hobby?** _____
2. **If yes, for how many seasons?** _____
3. **Have you ever used pesticides in house or gardening?** _____
4. **Do you golf or did you previously golf?** _____
5. **For how many years have you golfed?** _____
7. **How often have you golfed on average in season?** _____ (a few times yearly, monthly, weekly, a few times per week or more)
8. **Have you had your lawns chemically treated?** _____
9. **If yes, for how many years?** _____
10. **Have you lived within a mile of a golf course?** _____
11. **If yes, for how many years?** _____
12. **Have you used a well as a main drinking water source?** _____
13. **If yes, for how many years?** _____
14. **Have you ever lived with someone who worked with asbestos?** _____
15. **If yes, for how many years?** _____
16. **Have you ever had heartburn or acid reflux problems?** _____ (rarely, sometimes, often was or is a real problem)

FAMILY CANCER HISTORY

1. **Are you aware of the health history of the family members (mother, father, sisters, brothers, grandparents, aunts, uncles, children)**
2. **If yes, (number of each family member, cancer, type)**

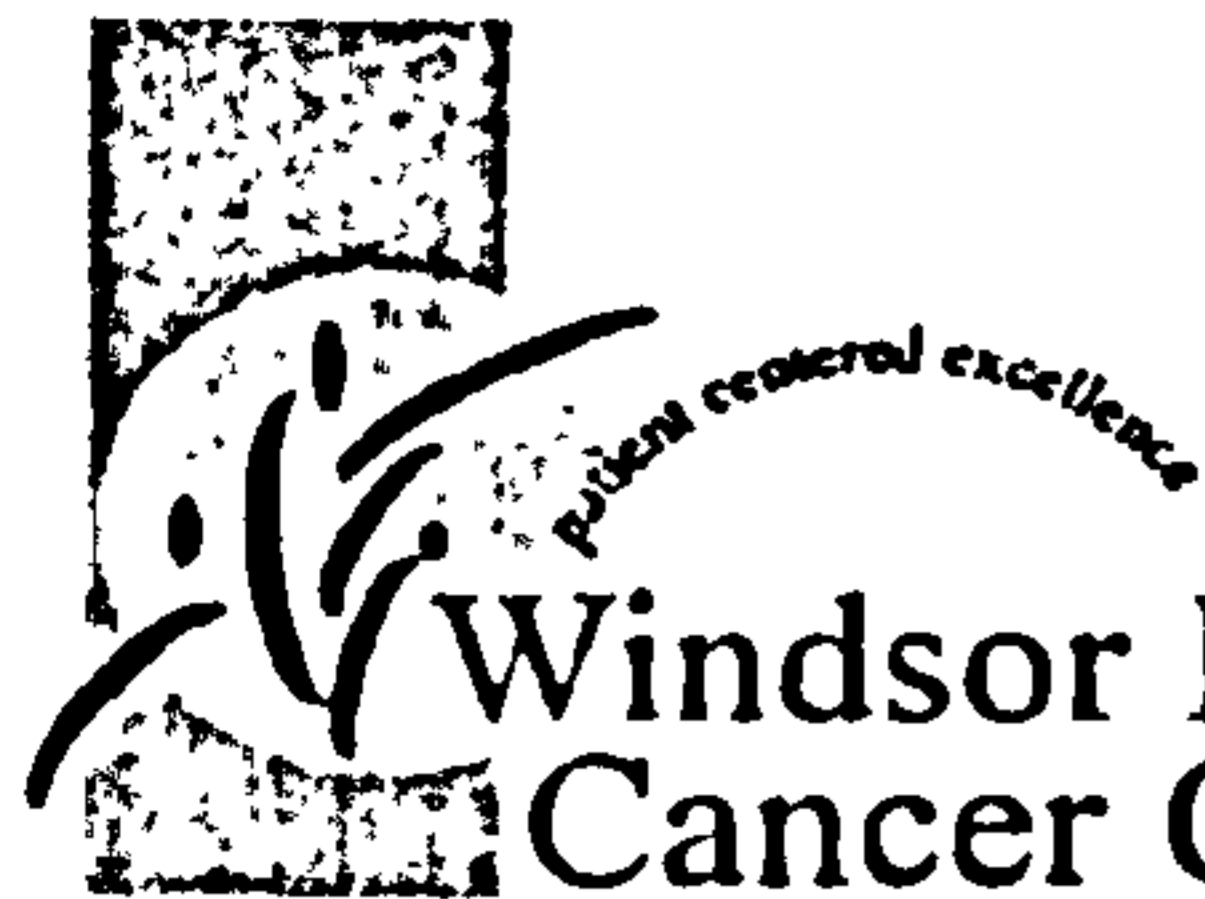
JOB HISTORY RECORD

For each job,

- 1. Industry? (categorized by NAIC groups and sub-groups)**
- 2. Which of the following best describes your job within the industry you identified? (categorized by NOC groups)**
- 3. Age when you started this job?**
- 4. Part time, Full time?**
- 5. Overtime?**
- 6. Age when you finished this job?**
- 7. At this job, how much exposure (none, a little, some, a lot) did you have to the following?
asbestos; other insulation –fibreglass, rockwool, other man-made mineral fibre; synthetic dusts or fibres – nylon, rayon, plastics; biogenic dusts or fibres – wood, cotton, paper, grain, linen, etc;
metal dusts or fumes; second-hand tobacco smoke; engine exhaust – other than usual travel; other smoke or particulate, metal-working fluids; solvents, paints, strippers; pesticides; computers; stress**

FOR AGRICULTURAL JOBS

- 1. How often did you mix, load, or apply to crops: fertilizer, herbicides (weed killers), fungicides (fungus or mold killer)**



Appendix S

Windsor Regional
Cancer Centre

Centre Régional De
Cancérologie De Windsor

2220 Kildare Road, Windsor, ON, N8W 2X3 Ph: 519-253-5253 Fax: 519-971-9922

Dear Patient:

We invite you to participate in a study to learn more about the factors which contribute to cancer risk in Essex County. Our long-term goal is to develop effective strategies to decrease the risk of cancer in our region.

This study is co-sponsored by the Windsor Regional Cancer Centre (WRCC), the Occupational Health Clinics for Ontario Workers (OHCOW) and the University of Windsor.

Participants will be asked about various residential, environmental, lifestyle, work, and family health history issues which may relate to cancer risks. We are currently focused on breast cancers in women and head and neck cancers in men. Patients are screened through medical records at the time of consultation at the WRCC to determine applicable diagnosis and cell-type for this study.

If you consent to participate, we will then arrange an interview with a trained member of our research team at the Cancer Centre. This interview will be scheduled at a time convenient for you, and will take approximately fifteen (15) minutes. All information provided is confidential and there will be no way to identify you in the study's published findings.

Your assistance with this research will be greatly appreciated. To compensate you for your time, a modest honorarium of \$20.00 will be given to you. Keep in mind that research such as this would not be possible without your support.

We believe that this study will be helpful as we work to better understand the origins of cancer in our region and sincerely hope you will consider participating.

If you would like to participate or have any questions about this study, please call **Nicole Mahler**, Research Project Director, at 253-5253, ext.58643 between the hours of 8:30 a.m. and 4:30 p.m.

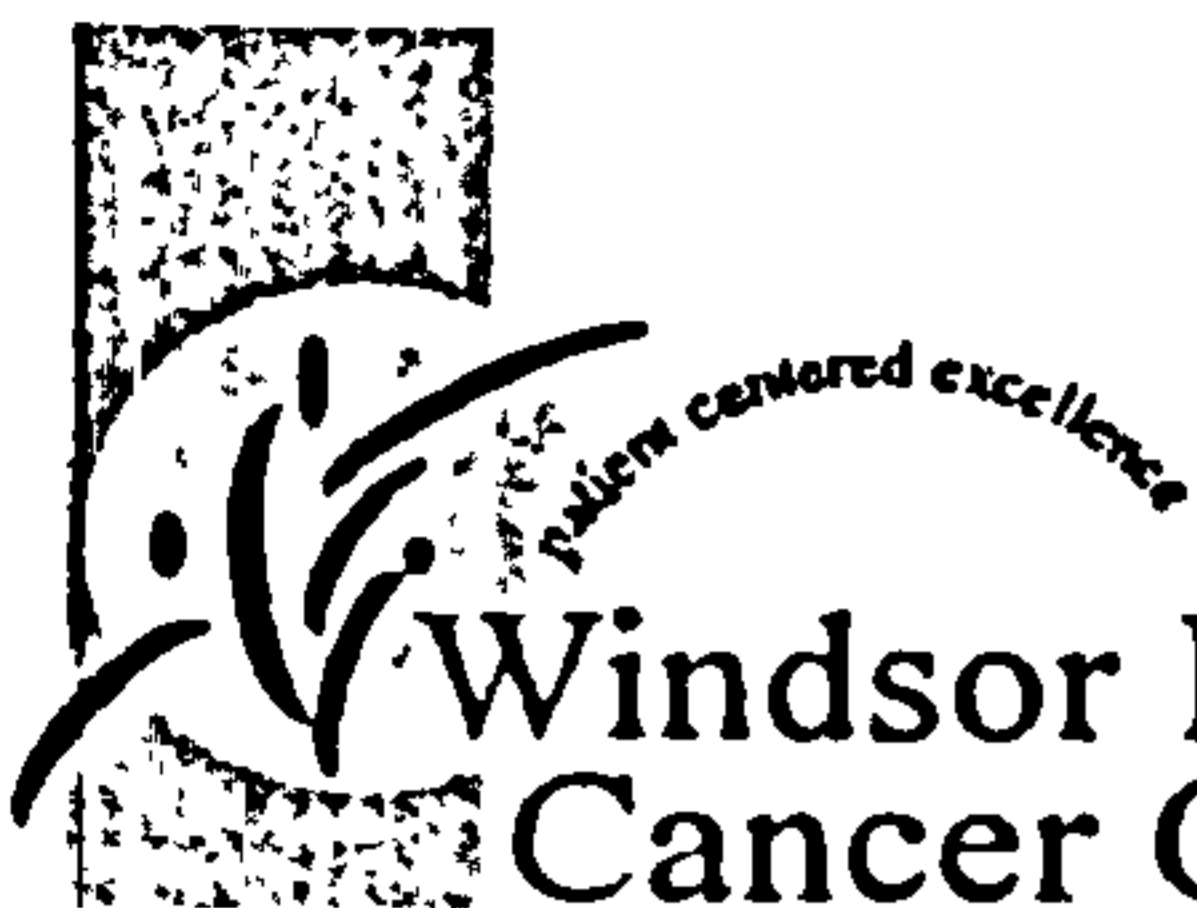
Yours truly,

E. Laukkanen, M.D., F.R.C.P.C.
CEO, Windsor Regional Cancer Centre

Kevin Gorey, Ph.D.
Associate Professor, University of Windsor



A Cancer Care Ontario Regional Cancer Centre
Un centre régional de cancérologie de Action Cancer Ontario



Appendix T

**Windsor Regional
Cancer Centre**

**Centre Régional De
Cancérologie De Windsor**

2220 Kildare Road, Windsor, ON, N8W 2X3 Ph: 519-253-5253 Fax: 519-971-9922

Dear

Your name was selected at random from residents in Windsor and Essex County to participate in a study organized by the Windsor Regional Cancer Centre, the Occupational Health Clinics for Ontario Workers, and the University of Windsor. The goal of the study is to learn more about the factors which contribute to cancer risk in Essex County. Our long-term goal is to develop effective strategies to decrease the risk of cancer in our region. The research design involves gathering information from randomly selected persons in the community who do not have cancer, and making comparisons with information obtained from cancer patients.

If you consent to participate, we would then arrange an interview with a trained member of our research team. The interview will take approximately fifteen (15) minutes, during which you will be asked residential, environmental, lifestyle, work, health and family history questions. The interview can be conducted at the Windsor Regional Cancer Centre, or an alternate location that is convenient for you, or even over the telephone. The information you provide will be kept in the strictest confidence, and there will be no way to identify you in the study's published findings.

Your assistance with this research will be greatly appreciated. As a token of thanks, and to compensate you for your time, you will receive a modest honorarium of \$20.00. We recognize that research such as this would not be possible without your support.

If you would like to further explore participation in this study, please call Nicole Mahler, Research Project Director, at 253-5253, extension 58 643 between 8:30 a.m. and 4:30 p.m. After hours, please leave a detailed voice message for Nicole at 253-3191, extension 58643.

We believe that this study will be helpful as we work to better understand the origins of cancer in our region and sincerely hope that you will consider participating. With thanks in advance,

Yours truly,

E. Laukkanen, M.D., F.R.C.P.C.
CEO, Windsor Regional Cancer Centre

Kevin Gorey, Ph.D.
Associate Professor University of Windsor



*A Cancer Care Ontario Regional Cancer Centre
Un centre régional de cancérologie de Action Cancer Ontario*

LOHIR TELEPHONE SCRIPT

CONTROL

Hi, this is _____ calling from the Windsor Regional Cancer Centre Risk History Project. You probably received a package from our research study about a week and a half ago and I'm calling today to answer any questions you may have about this study.

Essentially this study will compare information from cancer patients to local members of the community that are not being treated for cancer. All information is confidential and you cannot be identified in any published data. To capture an accurate picture of the community we are using randomly selected individuals. For this research it is very important that everyone selected participates in this study. We will be asking questions about your work history, where you've lived in Essex county, your family's cancer history and a few lifestyle questions (e.g. if you've ever golfed). The interviews have been taking on average twenty minutes and to compensate you for your time we'll give you \$20. We have been conducting most of these interviews at the Windsor Regional Cancer Centre but in order to make sure that everyone can participate, we are very flexible about the time and the location of the interview.

Would you be willing to participate in this study?
When is it convenient for us to schedule you for an interview?
Would you like a reminder call?

Leaving messages:

Hello, this is _____ calling from the Windsor Regional Cancer Centre Risk History Project. I am calling about a non-health related matter. We would like to schedule you for a confidential interview that will take approximately 20 minutes. We look forward to hearing from you, our phone number is 253 5253 Ext. 643. That number again is 253 5253 ext.643. Thank you.

PATIENT (CASE)

Hi, this is _____ calling from the Windsor Regional Cancer Centre Risk History Project. You received a letter about this study in your orientation package. I am calling today to answer any questions you may have about our study. You are scheduled for an appointment on _____ and if you would be willing to come in a half an hour early (or stay for a half an hour after your appointment) in order to complete an interview.

Essentially this study will compare information from cancer patients to local members of the community that are not being treated for cancer. All information is confidential and you cannot be identified in any published data. To capture an accurate picture of the community we are using randomly selected individuals. For this research it is very important that everyone selected participates in this study. We will be asking questions about your work history, where you've lived in Essex county, your family's cancer history and a few lifestyle questions (e.g. if you've ever golfed). The interviews have been taking on average twenty minutes and to compensate you for your time we'll give you \$20. We have been conducting most of these interviews at the Windsor Regional Cancer Centre but in order to make sure that everyone can participate, we are very flexible about the time and the location of the interview.

Would you be willing to participate in this study?
When is it convenient for us to schedule you for an interview?
Would you like a reminder call?

Leaving messages

Hello _____, this is _____ calling from the Windsor Regional Cancer Centre about the Risk History study. This is a non-health related matter. At your convenience please call Nicole Mahler at 253 3191 ext.58643. I look forward to hearing from you. Thank you.

PATIENT CONSENT FORM
RISK HISTORY RESEARCH PROJECT

INVESTIGATORS: James Brophy, Occupational Health Clinics for Ontario Workers, Margaret Keith, Windsor Occupational Health Information, Kevin Gorey, Ph.D., University of Windsor
Ethan Laukkanen, M.D., Windsor Regional Cancer Centre Deborah Hellyer, M.D., Ontario Health Clinics for Ontario Workers

PROJECT STAFF: Nicole Mahler, Project Director Johanna Krey, Susan Greco, Lisa Capretta, Nic Pieczonka (interviewers)

SPONSERS: This project is financially supported by the Workplace Safety and Insurance Board. It is supported in principle by the Occupational Health Clinics for Ontario Workers, Cancer Care Ontario and the Windsor Regional Cancer Centre

This study has received clearance from the Ethics Review Board of the Windsor Regional Cancer Centre and the University of Windsor's Ethics Committee. If you require more information, you may contact Nicole Mahler at the WRCC at 253-5253 ext 643.

If you are concerned about your rights as a participant please contact Dr. Attahiru Alfa Associate Vice President for Research, Office of Research Services, University of Windsor, 253-4232, extension 3916 or Dr. Art Kidd, Chairperson for the Windsor Human Research and Ethics Committee 253-5253 extension 572.

By signing this form, you indicate that you understand the information presented to you about this research study, and agree to participate in the Risk History Research Project interview. Your decision to participate will not affect any care or the services you receive.

The information collected by the interviewers will remain confidential.

Your signature on this form also documents the receipt of \$20.00 in appreciation for your time and effort.

(Please Print Name) (Signature) (Date)

(Receipt) (Signature) (Date)

(Investigator) (Signature) (Date)

STUDY PARTICIPANTS

Female Breast Cancer Patients *

	Participated in Study	Refused Participation	No. Of Patients out of Sampling Frame	Ineligible for other reasons
Female Patients	564 **	3	95Ψ	14 Φ

* Cases were diagnosed between January 1, 2000 and May 31, 2002. The interviews took place between June, 2000 and July 4, 2002.

Note: Re-referral of breast cancer patients - A total of 29 patients were sent to Detroit Hospitals for treatment due to long treatment waiting lists in Ontario until June 26/00. These patients were eventually seen post treatment at follow-up appointments at the WRCC.

**564 women with histologically confirmed breast cancer agreed to participate in the study. There were three women eligible to participate that refused. This is a greater than 99% participation rate.

Ψ 95 women with histological confirmed breast cancer were ineligible to participate because while they received treatment at the Windsor Regional Cancer Centre they resided outside of Essex County.

Φ 11 women died before we were able to arrange the interview, one woman was handicapped and unable to participate and 2 interviews were discarded due to lack of complete information.

Female Community Controls *

	No. of Interviews Completed	No. of Letters Sent to Controls	No. Who Refused Interview	No. of Letters Returned to Sender	No. Of Controls out of Sampling Frame
Windsor Female	367	1090	80	96	287
Windsor Suburb Female	173	442	29	39	78
Leamington Female	59	145	14	14	17

* The response rate for controls was: Windsor - 52.2%, Windsor Suburban - 53.2% and Leamington -51.8%.

Appendix X

NOC GROUPS USED IN LOHR BREAST CANCER ANALYSIS

NOT EMPLOYED

0000 – Not Employed (e.g. housewife)

OFFICE MANAGERS, OFFICIALS

0012 Senior Government Managers and Officials

0112 Human Resources Managers

0123 Other Business Services Managers

0411 Government Managers - Health and Social
Policy Development and Program Administration

0414 Other Managers in Public Administration

**OTHER MANAGERS, LAWYERS, PARALEGALS,
ARCHITECTS, POLICY AND RESEARCH, SKILLED
SALES AND SERVICE**

1474 Purchasing and Inventory Clerks

6231 Insurance Agents and Brokers

6232 Real Estate Agents and Salespersons

6431 Travel Counsellors

6216 Other Service Supervisors

6672 Other Attendants in Accommodation and Travel

0413 Government Managers - Education Policy

Development and Program Administration

4162 Economists and Economic Policy Researchers
and Analysts

4163 Business Development Officers and Marketing
Researchers and Consultants

4165 Health Policy Researchers, Consultants and
Program Officers

4166 Education Policy Researchers, Consultants and
Program Officers

4168 Program Officers Unique to Government

4169 Other Professional Occupations in Social
Science, n.e.c.

0211 Engineering Managers

0651 Other Services Managers

2151 Architects

2251 Architectural Technologists and Technicians

2253 Drafting Technologists and Technicians

4112 Lawyers and Quebec Notaries

4211 Paralegal and Related Occupations

0111 Financial Managers

0121 Insurance, Real Estate and Financial Brokerage
Managers

0122 Banking, Credit and Other Investment Managers

MANUFACTURING, ENGINEERING MANAGERS

0911 Manufacturing Managers

2141 Industrial and Manufacturing Engineers

PROFESSIONAL BUSINESS AND FINANCE

1111 Financial Auditors and Accountants

1112 Financial and Investment Analysts

1113 Securities Agents, Investment Dealers, Brokers

1211 Supervisors, General Office and Administrative
Support Clerks

1221 Administrative Officers

1222 Executive Assistants

1223 Personnel and Recruitment Officers

1224 Property Administrators

1225 Purchasing Agents and Officers

1231 Bookkeepers

1232 Loan Officers

1233 Insurance Adjusters and Claims Examiners

1241 Secretaries (Except Legal and Medical)

1242 Legal Secretaries

1243 Medical Secretaries

1244 Court Recorders and Medical Transcriptionists

4163 Business Development Officers and Marketing
Researchers and Consultants

CLERICAL, COMPUTER, WRITING, PUBLISHING

1411 General Office Clerks

1412 Clerk Typist

1413 Records Management and Filing Clerks

1414 Receptionists and Switchboard Operators

1422 Data Entry Clerks

1431 Accounting and Related Clerks

1432 Payroll Clerks

1433 Customer Service Reps – Financial Services

1441 Administrative Clerks

1442 Personnel Clerks

1443 Court Clerks

1453 Customer Service, Info. and Related Clerks

1454 Survey Interviewers and Statistical Clerks

6434 Ticket Agents, Cargo Service Reps and Related
Clerks (Except Airline)

6435 Hotel Front Desk Clerks

2147 Computer Engineers (Except Software
Engineers)

2162 Computer Analyst

2163 Computer Programmer

2174 Computer Programmers and Interactive Media
Developers

0512 Managers - Publishing, Motion Pictures,
Broadcasting and Performing Arts

1452 Correspondence, Publication, Related Clerks

5121 Authors and Writers

5123 Journalists

5124 Professional Occupations in Public Relations
and Communications

5125 Translators, Terminologists and Interpreters

POSTAL, COURIER, DELIVERY

0132 Postal and Courier Services Managers

1461 Mail, Postal and Related Clerks

1462 Letter Carriers

1463 Couriers, Messengers, Door-to-Door Distribut.

1471 Shippers and Receivers

7414 Delivery and Courier Service Drivers

LANDSCAPE

- 2225 Landscape. Horticultural Technicians, Specialists
- 8612 Landscaping, Grounds Maintenance Labourers

HEALTH CARE and RELATED SCIENCES

- 0311 Managers in Health Care
- 2121 Biologists and Related Scientists
- 3112 General Practitioners and Family Physicians
- 3131 Pharmacists
- 3132 Dietitians and Nutritionists
- 3141 Audiologists and Speech-Language Pathologists
- 3144 Other Prof. Occs. in Therapy and Assessment
- 3152 Registered Nurses
- 3211 Medical Laboratory Technologists and Pathologists' Assistants
- 3215 Medical Radiation Technologists
- 3217 Cardiology Technologists
- 3219 Other Medical Technologists and Technicians (Except Dental Health)
- 3222 Dental Hygienists and Dental Therapists
- 3232 Midwives and Practitioners of Natural Healing
- 3233 Licensed Practical Nurses
- 3235 Other Tech. Occs. in Therapy and Assessment
- 3411 Dental Assistants
- 3413 Nurse Aides, Orderlies, Patient Service Assoc.
- 3414 Other Assisting Occupations in Support of Health Services
- 6631 Medical Clinic Assistant

EDUCATION, LIBRARIES

- 0313 School Principals and Administrators of Elementary and Secondary
- 4121 University Professors
- 4122 Post-Secondary Teaching, Research Assistants
- 4131 College and Other Vocational Instructors
- 4141 Secondary School Teachers
- 4142 Elementary School and Kindergarten Teachers
- 4143 Educational Counsellors
- 4214 Early Childhood Educators and Assistants
- 4215 Instructors, Teachers of Persons with Disabilities
- 4216 Other Instructors
- 6472 Elementary and Secondary School Teacher Assistants
- 0511 Library, Archive, Museum, Art Gallery Managers
- 1451 Library Clerks
- 5111 Librarians
- 5211 Library and Archive Technicians and Assistants

SOCIAL WORK, PSYCHOLOGY AND CLERGY

- 0314 Managers in Social, Community and Correctional Services
- 4151 Psychologists
- 4152 Social Workers
- 4153 Family, Marriage and Other Related Counsellors

- 4154 Ministers of Religion
- 4212 Community and Social Service Workers
- 4213 Employment Counsellors

ART, CULTURE, CREATIVE, DANCERS, SPORT, RECREATION

- 5212 Technical Occupations Related to Museums and Art Galleries
- 5221 Photographers
- 5232 Other Performers
- 5241 Graphic Designers and Illustrators
- 5242 Interior Designers
- 5243 Theatre, Fashion, Exhibit, Other Creative Designers
- 5244 Artisans and Craftpersons
- 1226 Conference and Event Planners
- 0513 Recreation, Sports Program, Service Directors
- 4167 Recreation, Sports and Fitness Program Supervisors Consultants
- 5134 Dancers
- 5254 Program Leaders, Instructors Recreation, Sport
- 6671 Operators and Attendants in Amusement, Recreation and Sport
- 0721 Facility Operation and Maintenance Managers

RETAIL, WHOLESALE

- 0611 Sales, Marketing and Advertising Managers
- 0621 Retail Trade Managers
- 6211 Retail Trade Supervisors
- 6411 Sales Reps. - Wholesale Trade (Non-Technical)
- 6421 Retail Salespersons and Sales Clerks
- 6611 Cashiers
- 6622 Grocery Clerks and Store Shelf Stockers
- 6623 Other Elemental Sales Occupations

FOOD SERVICE AND ACCOMMODATION

- 0631 Restaurant and Food Service Managers
- 0632 Accommodation Service Managers
- 6212 Food Service Supervisors
- 6241 Chefs
- 6242 Cooks
- 6251 Butchers, Meat Cutters - Retail and Wholesale
- 6252 Bakers
- 6443 Casino Occupations
- 6451 Maitres d'hôtel and Hosts/Hostesses
- 6452 Bartenders
- 6453 Food and Beverage Servers
- 6641 Food Counter Attend., Kitchen Helpers, Related
- 6642 Kitchen Help, Dishwashers

HAIRDRESSING, BEAUTY

- 6271 Hairstylists and Barbers
- 6481 Image, Social and Other Personal Consultants
- 6482 Estheticians, Electrologists, Rel. Occupations

SECURITY

- 6464 Occupations Unique to the Armed Forces
- 6465 Other Protective Service Occupations
- 6651 Security Guards and Related Occupations

HOMEMAKERS, NANNIES

- 6471 Visiting Homemakers, Housekeepers and Related Occupations
- 6474 Babysitters, Nannies and Parents' Helpers

ANIMAL CARE

- 3213 Veterinary and Animal Health Technologists
- 6483 Pet Groomers and Animal Care Workers

CLEANING, JANITORIAL

- 6661 Light Duty Cleaners
- 6662 Specialized Cleaners
- 6663 Janitors, Caretakers, Building Superintendents
- 7351 Stationary Engineers and Auxiliary Equipment Operators

DRY CLEANING

- 6681 Dry Cleaning and Laundry Occupations
- 6683 Other Elemental Service Occupations

COMMUNICATIONS

- 1424 Telephone Operators
- 1475 Dispatchers and Radio Operators
- 7246 Telecommunication Installation, Repair Workers

TEXTILE AND LEATHER

- 7342 Tailors, Dressmakers, Furriers and Milliners
- 7343 Shoe Repairers and Shoemakers
- 9441 Textile Fibre, Yarn Prep. Machine Operators
- 9442 Weavers, Knitters, Other Fabric-Making Occs.
- 9443 Textile Dyeing and Finishing Machine Operators
- 9451 Sewing Machine Operators
- 9452 Fabric, Fur and Leather Cutters
- 9616 Labourers in Textile Processing

**PRINTING, FILM PROCESSING, PAINTERS,
CONSTRUCTION**

- 2264 Construction Inspectors
- 7284 Plasterers, Drywall Installers, Finishers, Lathers
- 7293 Insulators
- 7421 Heavy Equipment Operators (Except Crane)
- 9414 Concrete, Clay and Stone Forming Operators
- 2112 Chemists (paint)
- 7294 Painters and Decorators
- 9496 Painters and Coaters – Industrial
- 7381 Printing Press Operators
- 9471 Printing Machine Operators
- 9473 Binding and Finishing Machine Operators
- 9474 Photographic and Film Processors

**TRANSPORT, WAREHOUSING, CUSTOMS, GAS
STATION**

- 7411 Truck Drivers
- 7412 Bus Drivers, Subway, Other Transit Operators
- 7413 Taxi and Limousine Drivers and Chauffeurs
- 7451 Longshore Workers
- 7452 Material Handlers
- 7622 Railway and Motor Transport Labourers
- 7422 Public Works Maint. Equipment Operators
- 1228 Immigration, Employment Insurance and Revenue Officers
- 6621 Service Station Attendants

PEST CONTROL

- 7444 Pest Controllers and Fumigators

MINING, LOGGING, PAPERMAKING, WOOD

- 2223 Forestry Technologists and Technicians,
- 8231 Underground Production, Development Miners
- 8616 Logging and Forestry Labourers
- 9234 Papermaking and Coating Control Operators
- 9431 Sawmill Machine Operators
- 9435 Paper Converting Machine Operators
- 9611 Labourers in Mineral and Metal Processing
- 9493 Other Wood Products Assemblers, Inspectors

**ELECTRICAL, ELECTRONICS, OTHER
MANUFACTURING AND REPAIR**

- 9483 Electronics Assemblers, Fabricators, Inspectors, Testers
- 9484 Assemblers and Inspectors, Electrical Appliance, Apparatus and Equipment Manufacturing
- 9487 Machine Operators and Inspectors, Electrical Apparatus Manufacturing (move to electrical)
- 9413 Glass Forming and Finishing Machine Operators and Glass Cutters
- 9513 Woodworking Machine Operators
- 9491 Boat Assemblers and Inspectors
- 9619 Other Labourers in Processing, Manu., Utilities
- 7344 Jewellers, Watch Repairers, Rel. Occupations
- 9227 Supervisors, Other Products Manu., Assembly

AGRICULTURE

- 8251 Farmers and Farm Managers
- 8253 Farm Supervisors, Spec. Livestock Workers
- 8254 Nursery, Greenhouse Operators and Managers
- 8431 General Farm Workers
- 8432 Nursery and Greenhouse Workers
- 8611 Harvesting Labourers

CHEMICAL, PETROCHEMICAL

- 2211 Chemical Technologists and Technicians
- 9232 Petroleum, Gas, Chemical Process Operators
- 9421 Chemical Plant Machine Operators

RUBBER AND PLASTICS

- 9214 Supervisors, Plastic, Rubber Products Manu.
- 9422 Plastics Processing Machine Operators
- 9423 Rubber Processing Machine Operators and Related Workers
- 9495 Plastic Prod. Assemblers, Finishers, Inspectors
- 9615 Labourers in Rubber and Plastic Prod. Manu.

FOOD PROCESSING

- 9461 Process Control and Machine Operators, Food and Beverage Processing
- 9462 Industrial Butchers and Meat Cutters, Poultry Preparers and Related Workers
- 9463 Fish Plant Workers
- 9465 Testers and Graders, Food, Beverage Process.
- 2222 Agricultural and Fish Products Inspectors
- 9617 Labourers in Food, Beverage, Tobacco Process.
- 9618 Labourers in Fish Processing

AUTO, MACHINISTS, WELDING, FOUNDRY

- 7216 Contractors and Supervisors, Mechanic Trades
- 7231 Machinists, Machining and Tooling Inspectors
- 7232 Tool and Die Makers
- 9221 Supervisors, Motor Vehicle Assembling
- 9412 Foundry Workers
- 9612 Labourers in Metal Fabrication
- 9482 Motor Vehicle Assemblers, Inspectors, Testers
- 9486 Mechanical Assemblers and Inspectors
- 9497 Plating, Metal Spraying and Related Operators
- 9498 Other Assemblers and Inspectors
- 9511 Machining Tool Operators
- 9512 Forging Machine Operator
- 9514 Metalworking Machine Operators
- 9516 Other Metal Products Machine Operators
- 7265 Welders and Related Machine Operators
- 9515 Assembler, Tack Welders
- 9517 Other Products Machine Operator

Appendix Y: LOHR support letter from District Health Council

Essex, Kent and Lambton District Health Council

Conseil régional de santé d'Essex, Kent et Lambton

4510 RHODES DRIVE, UNIT 720
WINDSOR, ONTARIO N8W 5K5
TELEPHONE: (519) 944-5888
FAX: (519) 944-0819

January 22, 1999

Dr. Deborah Hellyer
Occupational Health Clinics
for Ontario Workers Inc.
547 Victoria Avenue
Windsor, ON

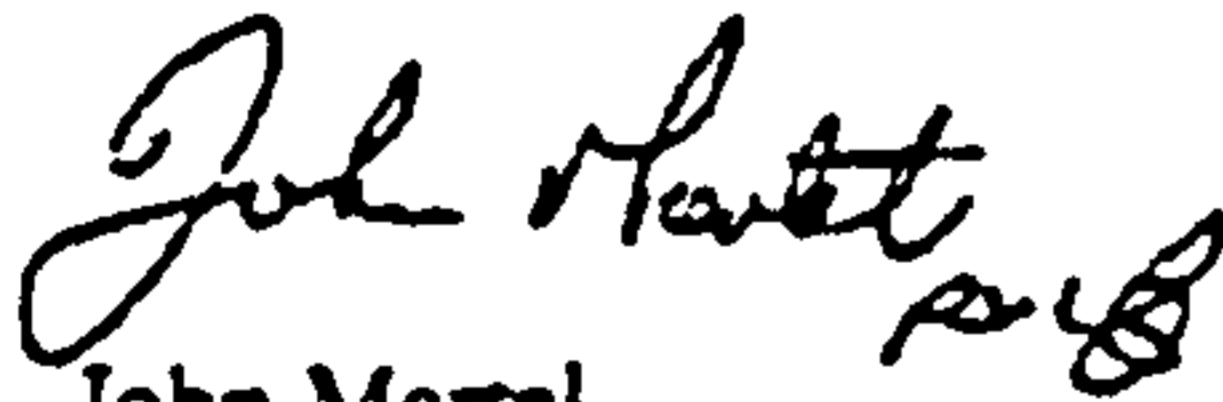
Dear Dr. Hellyer:

Thank you for your letter of January 21, 1999 outlining the proposed research project, being jointly submitted, by the Occupational Health Centre, University of Windsor and Windsor Regional Cancer Centre, to the Workplace Safety Insurance Board Research Advisory Council.

I have discussed this project with our Executive Director, and we both feel that if approved, the project could provide a valuable source of data, to assist EKL DHC, in future planning initiatives. As you know from your experience on the Essex County DHC, successful DHC planning, in many cases, starts from having relevant, timely and accurate data. However, obtaining such data, particularly for specific cities or districts, is often very difficult or impossible. A project such as the one you are proposing, would therefore be of great assistance to us, in identifying needs and planning for Cancer Care Services to the residents of our District.

On behalf of EKL DHC, I am pleased to express our strong support for the proposed research, and look forward to learning of your progress.

Yours sincerely,



John Martel
Chair

c: Frank Chalmers, Executive Director



WINDSOR WOMEN'S INCENTIVE CENTRE

3074 Dougall Ave., Windsor, Ontario, N9E 1S4

Tel. (519) 966-0992
Fax (519) 966-6053

April 27, 1999

WSIC Research Advisory Council
c/o Research Branch
8th Floor
200 Front St. W
Toronto, Ontario
M5V 3J1

RE: Occupational Histories of Windsor-Essex County Cancer Patients

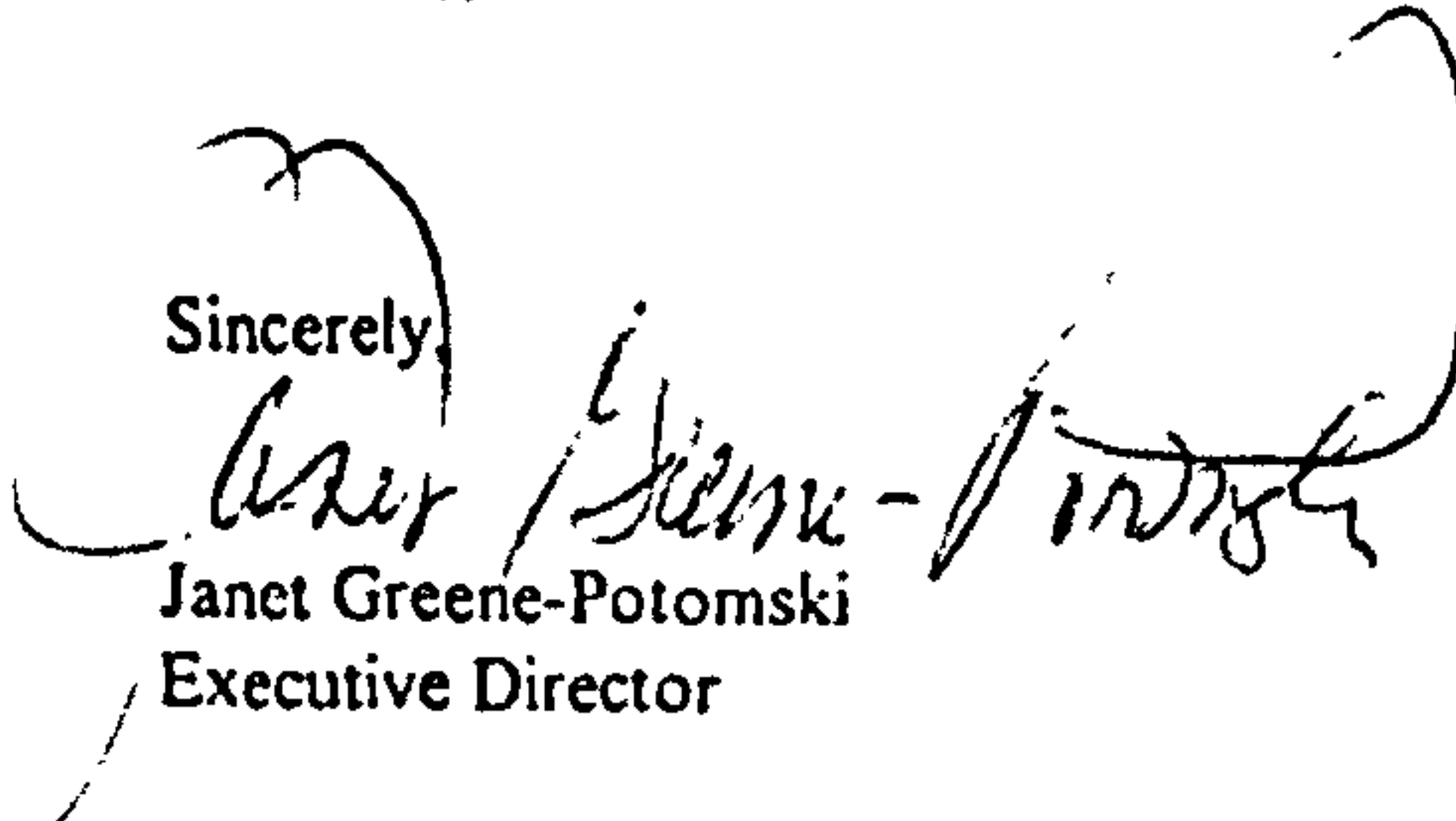
Dear Advisory Council Members:

The proposed project to collect and analyze data regarding occupation from cancer patients has the potential to provide very valuable information. The increasing incidence of breast, lung and other cancers among women is disturbing. The women's movement actively supports a number of efforts to understand this serious public health problem. Any new insight into cancer causation will increase our opportunities to initiate and support preventative strategies.

Women entered the labour force in great numbers a generation ago. At the same time, they became exposed for the first time to many new chemicals and work processes. Although women now make up almost half of the workforce, very few of the occupational cancer studies that have been undertaken include women. This occupational history project will help to determine whether a link exists between particular occupations and specific cancers.

We fully support this important public health research initiative.

Sincerely,


Janet Greene-Potomski
Executive Director

JGP

CHARITABLE # 13148 5858 RR0001

Appendix AA: LOHR support letter from Windsor & District Labour Council



Windsor & District Labour Council

COUNCIL MEETS 2ND TUESDAY, C.A.W. LOCAL 195 HALL - 7:30 P.M.
EXECUTIVE MEMBERS MEET 1ST & 3RD TUESDAYS, 195 HALL

1214 OTTAWA STREET, WINDSOR, ONTARIO N8X 2E6
Phone 252-8281

April 26, 1999

WSIB Research Advisory Council
C/o Research Branch
8th Floor
200 Front St. W.
Toronto, Ontario
M5V 3J1

RE: Occupational Histories of Windsor-Essex County Cancer Patients

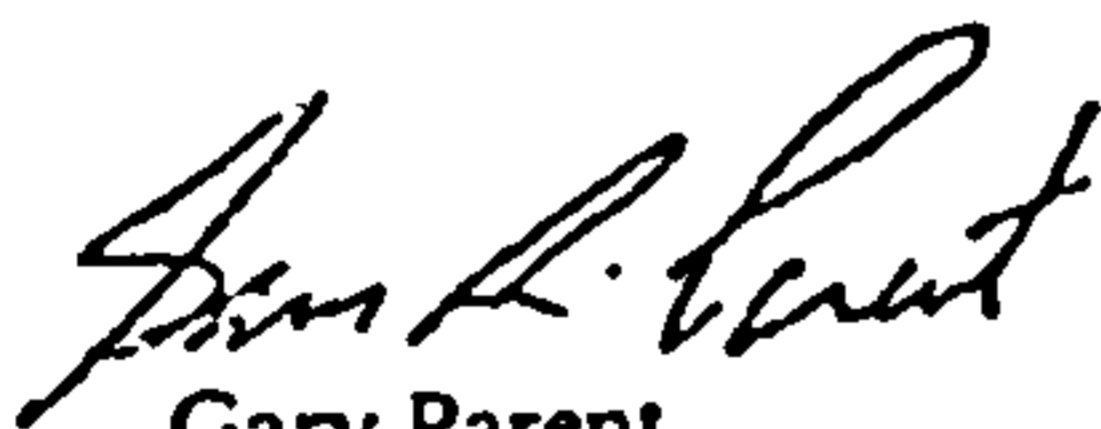
Dear Advisory Council Members,

On behalf of the Windsor & District Labour Council, I wish to convey the strong support that exists within our community for this important undertaking. Windsor is one of Ontario's industrial centres. The manufacturing processes located here rely on many chemicals and toxic substances in the course of production. The union movement has been concerned for many years about the possible link between exposures to these substances and the incidence of cancer among our members.

We believe that this project addresses our concerns about trying to identify possible cancer clusters, so that we can work to reduce exposures and prevent diseases.

This project is very innovative and has the potential to attract Regional Cancer Centres in other communities in Ontario. The Ontario Federation of Labour passed at its last convention a resolution to promote CROME throughout the province. If this project is able to secure through the WSIB the necessary funds to proceed, the Labour movement will lend its energy to encourage other communities to begin to gather similar information on the occupational histories of cancer patients.

Sincerely yours,


Gary Parent
President

GARY PARENT, President
ELLSWORTH BANKS, 1st Vice-President
KAREN MORRISON, Recording Secretary



NICK LaPOSTA, Financial Secretary
KAY KAVANAUGH, 2nd Vice-President
TERESA FRACAS, Sergeant-at-Arms

Appendix BB: LOHR support letter from Essex County Medical Society



DR. THOMAS BARNARD, M.D.
CCFP(EM), FRCPC (Geriatrics)
Family Medicine
Alternative Health Care

The Wellness Centre, Suite 507, 33 Princess Street, Leamington, Ontario N8H 4C5
Telephone (519) 326-7100 Fax (519) 326-4020 Internet: tbarnard@mac.net

April 20, 1999

Occupational Health Clinics for Ontario Workers Inc.
Windsor Clinic
547 Victoria Avenue
Windsor, Ontario
N9A 4N1

ATTENTION: Dr. Deborah Hellyer

Dear Dr. Hellyer:

I am writing in support of the involvement of the Occupational Health Clinic, University of Windsor and the Windsor Regional Cancer Centre in a joint research proposal to the Workplace Safety & Insurance Board Research Advisory Council.

As the President of the Essex County Medical Society, I have become deeply concerned about the high incidence of many illnesses in Essex County and the City of Windsor. Most notably I have become interested in the environmental and workplace effects as they influence the occurrence of cancers of various kinds in our community. Certainly the exposures of our citizens, the families of our workers and the workers themselves to various factors in the environment and in their workplace are of pressing concern to us in these considerations.

Toward that end, it is very exciting to me as the President of the Medical Society to learn of the ongoing research project cataloguing work histories and exposure histories of over 1000 patients in Windsor and Essex County. Because of its high incidence of illnesses, Essex County is an ideal location for this sort of research and it is I feel very inspiring to think that through this sort of information gathering and data analysis, we may in fact be able to leave the children of Windsor and Essex County a lower risk of cancer and ultimately of other degenerative diseases--heart disease, stroke etc.

Continued...



Appendix BB: LOHR support letter from Essex County Medical Society

April 20, 1999
Page 2

I would strongly encourage and be very pleased to take part in any way in the ongoing analysis of this information and collection of further information toward this end. It is paramount importance that we discover those potentially reversible causes of illnesses so that we might be able to intervene in for our own sake and for the sake of our children toward a healthier and brighter future for all of us.

Best regards,



Tom Barnard, M.D.
President Essex County Medical Society

TB/ta

LIFETIME OCCUPATIONAL AND ENVIRONMENTAL HISTORY RECORD: CORE QUESTIONNAIRE

INTRODUCTION: This questionnaire will ask you for information about yourself, your family, and places where you have lived and worked. Some questions may ask for sensitive information --- Be assured that all of your answers will be kept strictly confidential. Some of the questions will be difficult to answer, particularly those asking about the distant past. Please provide the best possible answer. The information you and others provide is very important to this study.

SECTION A: PERSONAL HISTORY

A1. What is your date of birth?

_____ / _____ / _____
 month day year

A2. What is your current marital status? Are you?

- Married**
- Living together with a partner**
- Widowed**
- Divorced**
- Separated**
- Single, never married**

A3. How tall are you? _____ feet _____ inches

A4. How much do you weigh now? _____ pounds

A5. Which best describes your highest level of education?

- Some elementary school**
- Completed elementary school**
- Some high school**
- Completed high school**
- Some college, trade school or university**
- College or trade school graduate**
- University graduate**
- Advanced university degree**

A6. What do you consider to be your race or ethnic group? If you belong to more than one group, please check all the groups you belong to.

- Caucasian or European**
- Multiracial**
- Black, African Canadian or African Ancestry**
- Latina or Hispanic**
- Arab or Middle Eastern**
- Native Canadian or Indigenous People**
- Asian or Pacific Islander**
- Other (Specify): _____**

A7. How many people (adults and children) currently live in your household? _____

A8. What is your annual family income? That is, the total income from all sources before taxes earned in the past year by all family members in your household.

- less than \$20,000**
- between \$20,000 and \$40,000**
- between \$40,000 and \$60,000**
- between \$60,000 and \$75,000**
- between \$75,000 and \$100,000**
- between \$100,000 and \$150,000**
- over \$150,000**

A9. Now I am going to ask you to consider how much physical exercise you have had during various periods of your life. Consider work and recreational physical activities sustained for periods of 30 minutes or more, e.g. aerobics class, fast walking, tennis, heavy physical labour, etc.)

- **Low** exercise level would be less than 2 periods of sustained physical exercise per week on a regular basis.
- **Medium** exercise level would be 2 to 3 periods of sustained physical exercise per week on a regular basis.
- **High** exercise level would be more than 3 periods of sustained physical exercise per week on a regular basis.

Ages 15-25	Low	Medium	High
Ages 26-50	Low	Medium	High
Ages 51-65	Low	Medium	High
After Age 65	Low	Medium	High

Additional Comments:

SECTION B: WORK HISTORY

This section deals with your work history. It should include all full-time and part-time jobs you've had as a paid or unpaid worker, homemaker, or volunteer. Please include all work you've done for at least 3 months total.

B1a. What was your 1st job?

Where: _____

What did you do? _____

B1b. During which years did you do this job?

_____ to _____
year year

Ages _____ to _____

{Complete applicable form}

- Fulltime homemaking in own home (No Form)
- Housekeeping someone else's home (Form 1)
- Office (non-industrial) (Form 1)
- Sales (Form 1)
- Restaurant, Hotel or Bar (Form 1)
- Education, School (Form 1)
- Health Care (Form 2)
- Manufacturing (Form 3)
- Transportation, Delivery (Form 1)
- Construction (Form 3)
- Farming (Form 4)
- Personal services, hairdressing, babysit, etc. (Form 1)
- Communications (Form 1)
- Other: _____ (Form 1)

If this was the last job, skip to SECTION C

B2a. What was your 2nd job?

Where: _____

What did you do? _____

B2b. During which years did you do this job?

_____ to _____
year year

Ages _____ to _____

[Complete applicable form]

- Fulltime homemaking in own home (No Form)
- Housekeeping someone else's home (Form 1)
- Office (non-industrial) (Form 1)
- Sales (complete Form 1)
- Restaurant, Hotel or Bar (Form 1)
- Education, School (Form 1)
- Health Care (Form 2)
- Manufacturing (Form 3)
- Transportation, Delivery (Form 1)
- Construction (Form 3)
- Farming (Form 4)
- Personal services, hairdressing, babysit, etc. (Form 1)
- Communications (Form 1)
- Other: _____ (Form 1)

If this was the last job, skip to SECTION C

B3a. What was your 3rd job?

Where: _____

What did you do? _____

B3b. During which years did you do this job?

_____ to _____
year year

Ages _____ to _____

[Complete applicable form]

- Fulltime homemaking in own home (No Form)
- Housekeeping someone else's home (Form 1)
- Office (non-industrial) (Form 1)
- Sales (complete Form 1)
- Restaurant, Hotel or Bar (Form 1)
- Education, School (Form 1)
- Health Care (Form 2)
- Manufacturing (Form 3)
- Transportation, Delivery (Form 1)
- Construction (Form 3)
- Farming (Form 4)
- Personal Service, babysit/hairdressing/etc (Form 1)
- Communications (Form 1)
- Other: _____ (Form 1)

If this was the last job, skip to SECTION C

B4. What was your 4th job?

Where: _____
What did you do? _____

B4b. During which years did you do this job?

_____ to _____
year year

Ages ____ to ____

[Complete applicable form]

- Fulltime homemaking in own home (No Form)
- Housekeeping someone else's home (Form 1)
- Office (non-industrial) (Form 1)
- Sales (complete Form 1)
- Restaurant, Hotel or Bar (Form 1)
- Education, School (Form 1)
- Health Care (Form 2)
- Manufacturing (Form 3)
- Transportation, Delivery (Form 1)
- Construction (Form 3)
- Farming (Form 4)
- Personal Service, babysit, hairdressing, etc (Form 1)
- Communications (Form 1)
- Other: _____ (Form 1)

If this was the last job, skip to SECTION C

B5a. What was your 5th job?

Where: _____
What did you do? _____

B5b. During which years did you do this job?

_____ to _____
year year

Ages ____ to ____

[Complete applicable form]

- Fulltime homemaking in own home (No Form)
- Housekeeping (someone else's home (Form 1)
- Babysitting in someone else's home (Form 1)
- Office (Form 1)
- Sales (complete Form 1)
- Restaurant, Hotel or Bar (Form 1)
- Education, School (Form 1)
- Health Care (Form 2)
- Manufacturing (Form 3)

- Transportation, Delivery (Form 1)
- Construction (Form 3)
- Farming (Form 4)
- Personal Service, babysit, hairdressing, (Form 1)
- Communications (Form 1)
- Other: _____ (Form 1)

If this was the last job, skip to SECTION C

B6a. What was your 6th job?

Where: _____
What did you do? _____

B6b. During which years did you do this job?

_____ to _____
year year

Ages ____ to ____

[Complete applicable form]

- Fulltime homemaking in own home (No Form)
- Housekeeping someone else's home (Form 1)
- Office (non-industrial) (Form 1)
- Sales (complete Form 1)
- Restaurant, Hotel or Bar (Form 1)
- Education, School (Form 1)
- Health Care (Form 2)
- Manufacturing (Form 3)
- Transportation, Delivery (Form 1)
- Construction (Form 3)
- Farming (Form 4)
- Personal Service, babysit, hairdressing, (Form 1)
- Communications (Form 1)
- Other: _____ (Form 1)

If this was the last job, skip to SECTION C

Additional Comments:

SECTION C: RESIDENTIAL HISTORY

This section deals with your residential history. It should include the first residence you lived in as an infant, the residence where you lived the longest and your current residence. Do not include school dormitories (unless they became your principal residence) or seasonal cottages, etc.

C1a. What years did you live in your 1st residence (as an infant?)

_____ to _____
year year

Ages ____ to ____

C1b. What best describes the area in which this residence was located?

- Don't Know
- Urban (city or town)
- Farm
- Rural (but not on a farm)

C1c. Is this residence in either Essex County or Kent County?

Yes No Don't Know

If Yes,

What city, town or rural area is it in?

Using the postal code map, what are the first three digits of the postal code for this residence?

Note: _____

If this is your is the last principal residence, please skip to SECTION D

During your childhood until you were about 12 or 13 years old where did you live the longest?

C2a. What years did you live in this residence?

_____ to _____
year year

Ages ____ to ____

C2b. What best describes the area in which this residence was located?

- Don't Know
- Urban (city or town)
- Farm
- Rural (but not on a farm)

C2c. Is this residence in either Essex or Kent County?

Yes No Don't Know

If yes,

What city, town or rural area is it in?

Using the postal code map, what are the first three digits of the postal code for this residence?

Note: _____

If this is your is the last principal residence, please skip to SECTION D

Now I want you to tell me about the residence where you lived the longest:

C3a. What years did you live in this principal residence (of at least 2 years)?

_____ to _____
year year

Ages ____ to ____

C3b. What best describes the area in which this residence was located?

- Don't Know
- Urban (city or town)
- Farm
- Rural (but not on a farm)

C3c. Is this residence in either Essex County or Kent County?

Yes No Don't Know

If Yes,

- What city, town or rural area is it in?

- Using the postal code map, what are the first three digits of the postal code for this residence?

If this is the last principal residence, please skip to SECTION D

Now I want you to tell me about your current residence.

C4a. Since what year have you lived in your current principal residence (of at least 2 years)?

_____ to _____
year year

Ages _____ to _____

C4b. What best describes the area in which this residence is located?

- Don't Know
- Urban (city or town)
- Farm
- Rural (but not on a farm)

C3c. Is this residence in either Essex County or Kent County?

Yes No Don't Know
If Yes,

- What city, town or rural area is it in?

- Using the postal code map, what are the first three digits of the postal code for this residence? _____

Additional Comments: (Insert Current Address)

Please go to SECTION D

SECTION D: NEARBY FACILITIES

D1. To your knowledge, have you ever lived within a ½ mile or under 1 km. of any of the following: e.g.

Airport? Yes No Don't Know

If Yes, what years? _____ to _____

Medical incinerator? Yes No Don't Know

If Yes, what years? _____ to _____

Garbage dump or landfill? Yes No Don't Know

If Yes, what years? _____ to _____

Hazardous waste site? Yes No Don't Know

If Yes, what years? _____ to _____

Farm or orchard? Yes No Don't Know

If Yes, what years? _____ to _____

Nursery or greenhouse? Yes No Don't Know

If Yes, what years? _____ to _____

Golf course? Yes No Don't Know

If Yes, what years? _____ to _____

Railroad track (in use)? Yes No Don't Know

If Yes, what years? _____ to _____

High-tension electric power lines?
Yes No Don't Know

If Yes, what years? _____ to _____

Electric power plant? Yes No Don't Know

If Yes, what years? _____ to _____

Major highway (at least 4 lanes)?
Yes No Don't Know

If Yes, what years? _____ to _____

Major bridge, such as Ambassador?
Yes No Don't Know

If Yes, what years? _____ to _____

Factory or industrial plant? Yes No Don't Know

If Yes, what years? _____ to _____

Foundry? Yes No Don't Know

If Yes, what years? _____ to _____

Pulp mill or lumber mill? Yes No Don't Know

If Yes, what years? _____ to _____

Smelter? Yes No Don't Know

If Yes, what years? _____ to _____

Quarry? Yes No Don't Know

If Yes, what years? _____ to _____

Underground mine? Yes No Don't Know

If Yes, what years? _____ to _____

Surface strip mine? Yes No Don't Know

If Yes, what years? _____ to _____

Oil refinery? Yes No Don't Know

If Yes, what years? _____ to _____

Gas station? Yes No Don't Know

If Yes, what years? _____ to _____

Other facility? _____ Yes No Don't Know

If Yes, what years? _____ to _____

D2. Can you think of any other exposures you may have had that might have had an impact on your health? Describe (what, where, how) ±Yes ±N

Additional Comments:

SECTION E: ALCOHOL

Now I am going to ask some questions about alcohol use.

E1a. How would you characterize your alcohol intake over various periods of your life? Use the following scale:

- *None (non-drinker)*
- *Low – less than 2 drinks per week*
- *Medium – 3 to 5 drinks per week*
- *High – more than 5 drinks per week*

(One drink equals one glass of wine or one bottle of beer or one ounce of liquor.)

Under Age 25	None	Low	Medium	High
Ages 26-50	None	Low	Medium	High
Ages 51-65	None	Low	Medium	High
After Age 65	None	Low	Medium	High

E1b. How many drinks per week on average _____

E2. If you quit drinking alcohol, what year did you quit?

Additional Comments:

SECTION F: TOBACCO

Now I am going to ask some questions about tobacco use.

F1. Have you smoked at total of 100 cigarettes or more in your lifetime?

Yes No Don't Know *[If no, skip to F6]*

F2. What year did you start smoking? _____

F3. Do you still smoke? Yes No

F4. If you quit smoking, what year did you quit?

5a. How would you characterize your cigarette smoking habits over various periods of your life?

- *None (non-smoker)*
- *Low – less than 10 cigarettes per day*
- *Medium – 10 to 20 cigarettes per day*
- *High – more than 20 cigarettes per day*

Under Age 25	None	Low	Medium	High
Ages 26-50	None	Low	Medium	High
Ages 51-65	None	Low	Medium	High
After Age 65	None	Low	Medium	High

F5b. Number of packs per week on average _____

F5c. For how many years? _____

F6. What other forms of tobacco have you regularly used?

- None
- Chewing tobacco
- Pipe
- Cigars
- Other _____

F7. When you were a child, how many parents or guardians, if any, smoked in your presence?

- None
- One (who) _____
- Two (or more) _____

F8. For how many years did he/she/they smoke in your presence? _____

F9. When you were an adult, did other members of your household regularly smoke in your presence?

Yes No Don't Know

F10. If yes, for how many years were you in the presence of household members when they smoked?

Additional Comments:

SECTION G: MEDICAL HISTORY

The next several questions ask about your personal medical history.

G1. How old were you when you had your first menstrual period? _____

G2. Are you still having menstrual periods? (or were until treatment, if applicable)
Yes No Don't Know [If YES, skip to G5].

G3. How old were you when your menstrual periods stopped? _____

G4. How did your menstrual periods stop?

Natural change of life (menopause)
As a result of surgery ± if so, were your ovaries removed?
As a result of medical treatment other than surgery
Some other cause (explain) _____

G5. Have you ever used birth control pills (oral contraceptives)
Yes No Don't Know
[If No or Don't Know, go to G9.]

G6. How old were you when you first used birth control pills? _____

G7. What was the total number of years you used birth control pills? _____

G8. How old were you when you last used birth control pills (may be current age)? _____

G9. Have you ever been pregnant?
Yes No Don't Know
[If No or Don't Know, skip to G13.]

G10. How many times have you been pregnant (even for a short while)? _____

How many live births? _____
How many miscarriages? _____
How many stillbirths? _____
Other termination of pregnancy? _____

G11. How old were you at the end of your first pregnancy? _____

G12. Did you breastfeed?
Yes No
If yes, how many months in total?

G13. Did you or any of your family members have birth defects or special health problems at birth or any problems that were later diagnosed as being congenital or birth defects? We are interested in your child or children, sisters, brothers, mother, father or yourself?
Yes No Don't Know
If yes, explain: (i.e. who, what problem)

G14. Have you or any of your children been diagnosed with autism, attention deficit hyperactivity disorder (ADHD) or another behavioral or psychological disorder including depression?
Yes No Don't Know
If yes, explain: (i.e. who, what problem)

G15. Have you ever taken estrogen hormone replacement medication?
Yes No Don't Know
[If No or Don't Know, skip to Section H]

G16. How old were you when you first used estrogen hormone replacement medication? _____ years old.

G17. How old were you when you last used estrogen hormone replacement medication (may be current age)? _____ years old.

G18. Did you use this medication continuously?
Yes No Don't know
If no, specify how long in total

Additional Comments:

SECTION H: FAMILY HISTORY

The next questions are regarding your family history.

H1. Have you or any of your immediate blood relatives ever been diagnosed with cancer, and if so what was the primary site? (e.g. breast)

Self _____

Mother _____

Father _____

Sister(s) _____

Brother(s) _____

Daughter(s) _____

Son(s) _____

Mother's mother (maternal gm) _____

Father's mother (paternal gm) _____

Mother's father (maternal gf) _____

Father's father (paternal gf) _____

Aunt(s) _____

Uncle(s) _____

[Note: details such as dates, ages, etc.]

Additional Comments:

SECTION I: PRENATAL HISTORY

Now I am going to ask you some questions about your mother's pregnancy history.

I1. First of all, were you adopted?

Yes No Don't Know [If yes, skip to Section JJ]

I2. Where did your mother live when she was pregnant for you? What best describes the area in which this residence was located?

- Don't Know
- Urban (city or town)
- Farm
- Rural (but not on a farm)

I3a. Did your mother work outside the home during any part of her pregnancy when she was pregnant with you?

Yes No Don't Know

If YES,

I3b. What was her occupation [or describe job]?

I3c. Where did she work? (name of workplace if known) _____

I3d. What kind of workplace was this? [describe industry, e.g. farm]

I4. Did your mother smoke cigarettes during her pregnancy with you?

Yes No Don't Know

I5. Did your mother drink alcohol during her pregnancy with you?

Yes No Don't Know

I6. Did your mother breastfeed you?

Yes No Don't Know

I7a. Did your father work outside the home before and during the time your mother was pregnant with you?

Yes No Don't Know

I7b. What was his occupation [or describe job]?

I7c. Where did he work? (name of workplace if known) _____

I7d. What kind of workplace was this? [describe industry, e.g. farm]

Additional Comments:

SECTION J: ADDITIONAL QUESTIONS

Now I'm going to finish up by asking a few miscellaneous questions.

J1. What crafts, hobbies or sports have you regularly engaged in? (and how many hours per month for how many years?)

_____ # _____ hrs./mo. for _____ yrs
 _____ # _____ hrs./mo. for _____ yrs
 _____ # _____ hrs./mo. for _____ yrs
 _____ # _____ hrs./mo. for _____ yrs
 _____ # _____ hrs./mo. for _____ yrs
 _____ # _____ hrs./mo. for _____ yrs
 _____ # _____ hrs./mo. for _____ yrs

J2a. Have you ever come into regular contact with asbestos (other than through your own employment outside the home)? For example, have you ever lived with someone who worked with asbestos, washed contaminated work clothing, etc.?

Yes No Don't Know
 If No or Don't Know, skip to J3a.

J2b. Can you please describe the circumstances?

J2c. For how many years were you in regular contact with asbestos? _____ years

J3a. Have you ever used an electric blanket/ waterbed?
 Yes No Don't Know

J3b. For how many years did you use an electric blanket/waterbed? _____ years

J4 a. Approximately how many servings of fish have you eaten per week on average?
 _____ servings per week

Describe any major change:

J4 b. Approximately how many servings of red meat have you eaten per week on average?
 _____ servings per week

Describe any major change:

J4 c. Approximately how many servings of fruits and vegetables have you eaten per week on average?
 _____ servings per week

Describe any major change:

J5. Have you or anyone else used pesticides or lawn chemicals on a regular basis around your house, yard, garden, or animals for any of the following:

Insects (e.g. ants, bees, wasps, flies or mosquitoes, moths, silverfish, caterpillars, spiders, aphids, termites, grubs, etc.) _____ X per year

Weeds (e.g. lawn or garden chemical treatment) _____ X per year

Rodents (e.g. mice, rats, gophers, moles) _____ X per year

Lice (e.g. treatment, shampoos for self or others) _____ X per year

Fleas or ticks (e.g. pets, animals, your residence) _____ X per year

J6. Approximately how many chest x-rays have you had in your lifetime? _____ X per year

J7a. Have you ever had a mammogram? Yes No

J7b. If yes, how many? _____

J7c. What were your husband(s)' occupations?

Thank you for your time and patience and for your important contribution to this research.

EVALUATION:

How did you find the interview? What did you like or dislike?

Would it be all right with you if I shared your thoughts on this with others? I won't use your name or identify you in any way.

Yes _____ No _____

LOEHR Form 1 – General (Occ. History Details) ID# _____ JOB# _____

O1. WHERE? (What business, organization or service did you work in?) (name optional)

O2a. WHAT was the main function or activity of the business, organization or service. In other words, what was produced OR what service was provided?

O2b. What was your particular job?

O2c. During which years did you do this job? (can retrieve this data from General Core Questionnaire)

~~~~ to ~~~~  
year year  
Ages \_\_\_\_ to \_\_\_\_

**O3.** On average, how many hours per week did you work on this job? \_\_\_\_\_ hrs/wk

**O4.** Did you work rotating shifts? ±Yes ±No ±Don't Know

**O5a.** Did you regularly work any hours after midnight on this job?

±Yes ±No ±Don't Know

*[If No or Don't Know, skip to O6.]*

**O5b.** How many hours did you work after midnight each night? (e.g. 11 pm shift to 7 am = 7 hours after midnight) \_\_\_\_\_ hours after midnight

**O5c.** How often did you work after midnight? (e.g. 2 wks out of 6 = 1/3 of the time)

±Always ±½ of the time ± 1/3 the time ±1/4 of the time ± other \_\_\_\_\_

**O5d.** For how many months or years did you work after midnight? \_\_\_\_\_ months OR \_\_\_\_\_ years

**O6.** In what department did you work (if any)?

±No Department

±Department: \_\_\_\_\_

**O7.** I would like you to describe your usual tasks. What did you do and how did you do it? What materials, equipment or machines did you use during your work?

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Appendix DD

**O8.** What chemicals or other substances or did you use. Include any you loaded, unloaded, packaged, poured, applied or administered or any that were in or near your work area? Describe how they were being used?

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**O9.** What work was being done around you by others? What equipment, chemical and materials were they using?

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**O10a** Can you describe the environment in your work area, such as the air quality, noise levels, temperature, number of people or machines, etc.?

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**O10b.** Did you work with or near any electrical equipment, computers, etc.

Yes     No     Don't Know

**O10c.** If yes, describe it (what kinds, how was it being used, how much was there, how close were they to you, and how often or many hours per week?)

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**O11a.** Did you have to wear any protective equipment while at work?

Yes     No     Don't Know

*[If No or Don't Know, skip to O8a.]*

**O11b.** What protective equipment did you use, why and how often?

What: \_\_\_\_\_

Why: \_\_\_\_\_

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How Often: \_\_\_\_\_



Appendix DD

**O12a.** Did this job seem to you to have an effect on your physical health? In other words did you ever experience health problems or symptoms that you felt were related to this job?

±Yes    ±No    ±Don't Know

***[If No or Don't Know, skip to O9a.]***

**O12b.** Can you explain in what way you felt your health was affected and why?

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**O13a.** Was there anything you did not like to do at this job?

±Yes    ±No    ±Don't Know

***[If No or Don't Know, skip to O7a.]***

**O13b.** Can you explain what you did not like to do and why?

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**O14a.** How stressful was the job? Did it make you feel tense or anxious most of the time?

±Yes    ±No    ±Don't Know

***[If No or Don't Know, skip to O8.]***

**O14b.** Can you explain in what way the job was stressful for you?

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Appendix EE

**LOEHR Form 2 – Health Care (Occ. History Details)** ID# \_\_\_\_\_ JOB# \_\_\_\_\_

**O1. WHERE?** What business, organization or service did you work in? (name optional)

\_\_\_\_\_

**O2a. WHAT** was the main function or activity of the business, organization or service. In other words, what was produced OR what service was provided?

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**O2b.** What was your particular job?

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**O2c. During which years did you do this job? (can retrieve this data from General Core Questionnaire)**

~~~~ to ~~~~  
year year
Ages ____ to ____

O3. On average, how many hours per week did you work on this job? _____ hrs/wk

O4. Did you work rotating shifts? ±Yes ±No ±Don't Know

O5a. Did you regularly work any hours after midnight on this job?

±Yes ±No ±Don't Know

[If No or Don't Know, skip to O6.]

O5b. How many hours did you work after midnight each night? (e.g. 11 pm shift to 7 am = 7 hours after midnight) _____ hours after midnight

O5c. How often did you work after midnight? (e.g. 2 wks out of 6 = 1/3 of the time)

±Always ±½ of the time ± 1/3 the time ±1/4 of the time ± other _____

O5d. For how many months or years did you work after midnight? _____ months **OR** _____ years

O6. In what department did you work (if any)?

±No Department

±Department: _____

O7. I would like you to describe your usual tasks. What did you do and how did you do it? What materials, equipment or machines did you use during your work?

Appendix EE

O8. What chemicals or other substances or did you use. Include any you loaded, unloaded, packaged, poured, applied or administered or any that were in or near your work area? Describe how they were being used?

O9. What work was being done around you by others? What equipment, chemical and materials were they using?

O10. Can you describe the environment in your work area, such as the air quality, noise levels, temperature, number of people or machines, etc.?

O11a. Did you have to wear any protective equipment while at work?

±Yes ±No ±Don't Know
[If No or Don't Know, skip to O8a.]

O11b. What protective equipment did you use, why and how often?

What: _____

Why: _____

How Often: _____

O12a. Did this job seem to you to have an effect on your physical health? In other words did you ever experience health problems or symptoms that you felt were related to this job?

±Yes ±No ±Don't Know
[If No or Don't Know, skip to O9a.]

O12b. Can you explain in what way you felt your health was affected and why?

Appendix EE

O13a. Was there anything you did not like to do at this job?

±Yes ±No ±Don't Know

[If No or Don't Know, skip to O7a.]

O13b. Can you explain what you did not like to do and why?

O14a. How stressful was the job? Did it make you feel tense or anxious most of the time?

±Yes ±No ±Don't Know

[If No or Don't Know, skip to O8.]

O14b. Can you explain in what way the job was stressful for you?

O15a. Was there any dust in the environment where you worked?

±Yes ±No ±Don't Know

O15b. If yes, describe it (what was it, how was it being used or produced, how much was there, and how often?)

O16a. Were there any vapours or smoke (e.g. tobacco smoke) in the environment where you worked?

±Yes ±No ±Don't Know

O16b. If yes, describe it (what kinds, how was it being produced, how much was there, and how often?)

LOEHR Form 3 – Manufacturing and Construction (Occ. History Details)

O1. WHERE? What business, organization or service did you work in? (name optional)

O2a. WHAT was the main function or activity of the business, organization or service. In other words, what was produced OR what service was provided?

O2b. What was your particular job?

O2c. During which years did you do this job? (can retrieve this data from General Core Questionnaire)

~~~~ to ~~~~~  
year year  
Ages \_\_\_\_ to \_\_\_\_

**O3.** On average, how many hours per week did you work on this job? \_\_\_\_\_ hrs/wk

**O4.** Did you work rotating shifts? ±Yes ±No ±Don't Know

**O5a.** Did you regularly work any hours after midnight on this job?

±Yes ±No ±Don't Know

**[If No or Don't Know, skip to O6.]**

**O5b.** How many hours did you work after midnight each night? (e.g. 11 pm shift to 7 am = 7 hours after midnight) \_\_\_\_\_ hours after midnight

**O5c.** How often did you work after midnight? (e.g. 2 wks out of 6 = 1/3 of the time)

±Always ±½ of the time ± 1/3 the time ±1/4 of the time ± other \_\_\_\_\_

**O5d.** For how many months or years did you work after midnight? \_\_\_\_\_ months **OR** \_\_\_\_\_ years

**O6.** In what department did you work (if any)?

±No Department

±Department: \_\_\_\_\_



Appendix FF

**O7.** I would like you to describe your usual tasks. What did you do and how did you do it? What materials, equipment or machines did you use during your work?

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**O8.** What chemicals or other substances or did you use. Include any you loaded, unloaded, packaged, poured, applied or administered or any that were in or near your work area? Describe how they were being used?

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**O9.** What work was being done around you by others? What equipment, chemical and materials were they using?

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**O10.** Can you describe the environment in your work area, such as the air quality, noise levels, temperature, number of people or machines, etc.?

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**O11a.** Did you have to wear any protective equipment while at work?

±Yes    ±No    ±Don't Know  
*[If No or Don't Know, skip to O8a.]*

Appendix FF

**O11b. What protective equipment did you use, why and how often?**

What: \_\_\_\_\_

Why: \_\_\_\_\_

\_\_\_\_\_

How Often: \_\_\_\_\_

**O12a. Did this job seem to you to have an effect on your physical health? In other words did you ever experience health problems or symptoms that you felt were related to this job?**

Yes     No     Don't Know

***[If No or Don't Know, skip to O9a.]***

**O12b. Can you explain in what way you felt your health was affected and why?**

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**O13a. Was there anything you did not like to do at this job?**

Yes     No     Don't Know

***[If No or Don't Know, skip to O7a.]***

**O13b. Can you explain what you did not like to do and why?**

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**O14a. How stressful was the job? Did it make you feel tense or anxious most of the time?**

Yes     No     Don't Know

***[If No or Don't Know, skip to O8.]***

**O14b. Can you explain in what way the job was stressful for you?**

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**O15a. Was there any dust in the environment where you worked?**

Yes     No     Don't Know

**O15b. If yes, describe it (what was it, how was it being used or produced, how much was there, and how often?)**

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



Appendix FF

**O16a.** Were there any vapours, vehicle emissions, or smoke (e.g, tobacco smoke) in the environment where you worked?

Yes     No     Don't Know

**O16b.** If yes, describe it (what kinds, how was it being produced, how much was there, and how often?)

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**O17a.** Did you work with or near any electrical equipment, computers, etc.

Yes     No     Don't Know

**O17b.** If yes, describe it (what kinds, how was it being used, how much was there, how close were they to you, and how many hours per week?)

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**O18a.** Were there any radioactive materials or radiation in the environment where you worked?

Yes     No     Don't Know

**O18b.** If yes, describe it (what kinds, how was it being used, how much was there, how often?)

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**O19a.** Were there any metal fumes, cutting oils, or metal-working fluids in the environment where you worked?

Yes     No     Don't Know

**O19b.** If yes, describe it (what kinds, how was it being used, how much was there, how often?)

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**O20a.** Were there any solvents, paints, hardeners or glues in the environment where you worked?

Yes     No     Don't Know

**O20b.** If yes, describe it (what kinds, how was it being used, how much was there, how often?)

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Appendix FF

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**O21a. Were any of the following chemicals used in or around your work environment?**

|                              |                             |                                     |                                                            |
|------------------------------|-----------------------------|-------------------------------------|------------------------------------------------------------|
| <input type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> Don't Know | Acids or acid mists                                        |
| <input type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> Don't Know | Alcohol (methyl alcohol, ethyl alcohol, isopropyl alcohol) |
| <input type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> Don't Know | Tars, asphalt, roofing tars, creosote, coke oven emissions |
| <input type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> Don't Know | Bleach, chlorine products                                  |
| <input type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> Don't Know | Chloroform                                                 |
| <input type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> Don't Know | Sterilants (e.g.ethylene oxide)                            |
| <input type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> Don't Know | Moulds, bacteria, microbes, viruses                        |

**O21b. If yes, describe it (what kinds, how was it being used, how much was there, and how often?)**

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**O22a. Did any of the processes involve the heating of materials?**

Yes     No     Don't Know

**O22b. If yes, describe what was being heated and how and how often this process took place**

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Appendix GG

**LOEHR Form 4 – Farming (Occ. History Details)** ID# \_\_\_\_\_ JOB# \_\_\_\_\_

**O1. What business, organization or service did you work in? (name optional)**

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**O2a. What was the main function or activity of the business, organization or service. In other words, what was produced OR what service was provided? (Select livestock or crops below as applicable)**

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- |                                                           |        |
|-----------------------------------------------------------|--------|
| ±Livestock (name) _____                                   | _____  |
| ±Soybean Farming                                          | 11111  |
| ±Tomato                                                   | _____  |
| ±Oilseed (except Soybean) Farming                         | 11112  |
| ±Dry Pea and Bean Farming                                 | 11113  |
| ±Wheat Farming                                            | 11114  |
| ±Corn Farming                                             | 11115  |
| ±Rice Farming                                             | 11116  |
| ±Other Grain Farming: _____                               | 11119  |
| ±Potato Farming                                           | 111211 |
| ±Other Vegetable (except Potato) and Melon Farming        | 111219 |
| ±Orange Groves                                            | 11131  |
| ±Citrus (except Orange) Groves                            | 11132  |
| ±Apple Orchards                                           | 111331 |
| ±Grape Vineyards                                          | 111332 |
| ±Strawberry Farming                                       | 111333 |
| ±Berry (except Strawberry) Farming                        | 111334 |
| ±Tree Nut Farming                                         | 111335 |
| ±Other Non-citrus Fruit Farming (TOMATOES)                | 111339 |
| ±Mushroom Production                                      | 111411 |
| ±Other Food Crops Grown Under Cover                       | 111419 |
| ±Nursery and Floriculture Production (eg. trees, flowers) | 11142  |
| ±Tobacco Farming                                          | 11191  |
| ±Cotton Farming                                           | 11192  |
| ±Sugarcane Farming                                        | 11193  |
| ±Hay Farming                                              | 11194  |
| ±Sugar Beet Farming                                       | 111991 |
| ±Peanut Farming                                           | 111992 |
| ±OTHER: _____                                             |        |

**O2b. What was your particular job?**

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Appendix GG

O2c. During which years did you do this job? (can retrieve this data from General Core Questionnaire)

~~~~ to ~~~~  
year year
Ages ____ to ____

O3. Did you spend most of your time working in:

- ± Fields
- ± Orchards
- ± Vinyards
- ± Greenhouse
- ± Barn other Building

O4. On average, how many months of the year did you work on this job? _____ months per year

O5. On average, how many hours per week did you work on this job? _____ hours per week

O6. Did you work rotating shifts? ±Yes ±No ±Don't Know

O7a. Did you regularly work any hours after midnight on this job?

- ±Yes ±No ±Don't Know

[If No or Don't Know, skip to O6.]

O7b. How many hours did you work after midnight each night? (e.g. 11 pm shift to 7 am = 7 hours after midnight) _____ hours after midnight

O7c. How often did you work after midnight? (e.g. 2 wks out of 6 = 1/3 of the time)

- ±Always ±1/2 of the time ± 1/3 the time ±1/4 of the time ± other _____

O7d. For how many months or years did you work after midnight? _____ months OR _____ years

O8. I would like you to describe your usual tasks. What did you do and how did you do it? What materials, equipment or machines did you use during your work?

O9. Did you mix, load, apply or come into contact with any of the following agricultural chemicals?

Chemical fertilizers: ±Yes ±No ±Don't Know
 If YES, how many times per year did you:
 Mix _____ times per year
 Load _____ times per year
 Apply _____ times per year

Appendix GG

Insecticides: ±Yes ±No ±Don't Know
If YES, how many times per year did you:
Mix _____ times per year
Load _____ times per year
Apply _____ times per year

Herbicides: ±Yes ±No ±Don't Know
If YES, how many times per year did you:
Mix _____ times per year
Load _____ times per year
Apply _____ times per year

Fungicides: ±Yes ±No ±Don't Know
If YES, how many times per year did you:
Mix _____ times per year
Load _____ times per year
Apply _____ times per year

Others: _____ ±Yes ±No ±Don't Know
If YES, how many times per year did you:
Mix _____ times per year
Load _____ times per year
Apply _____ times per year

O10a. Were you ever in the area or very nearby while pesticides were being mixed, loaded or applied by someone else?

±Yes ±No ±Don't Know

O10b. If YES, how many times per year were you in the vicinity? _____ times per year

O11a. Did you ever enter the field or orchard or other area within two days of it having been sprayed or dusted with pesticides?

±Yes ±No ±Don't Know

O11b. If YES, how many times per year? : _____ times per year

O12. What other chemicals or other substances or did you use. Include any you loaded, unloaded, packaged, poured, applied or administered or any that were in or near your work area? Describe how they were being used?

O13. What work was being done around you by others? What equipment, chemical and materials were they using?

Appendix GG

O14. Can you describe the environment in your work area, such as the air quality, noise levels, temperature, number of people or machines, etc.?

O15a. Did you have to wear any protective equipment while at work?

±Yes ±No ±Don't Know

[If No or Don't Know, skip to O8a.]

O15b. What protective equipment did you use, why and how often?

What: _____

Why: _____

How Often: _____

O16a. Did this job seem to you to have an effect on your physical health? In other words did you ever experience health problems or symptoms that you felt were related to this job?

±Yes ±No ±Don't Know

[If No or Don't Know, skip to O9a.]

O16b. Can you explain in what way you felt your health was affected and why?

O17a. Was there anything you did not like to do at this job?

±Yes ±No ±Don't Know

[If No or Don't Know, skip to O7a.]

O17b. Can you explain what you did not like to do and why?

O18a. How stressful was the job? Did it make you feel tense or anxious most of the time?

±Yes ±No ±Don't Know

[If No or Don't Know, skip to O8.]

Appendix GG

O18b. Can you explain in what way the job was stressful for you?

O19a. Did you work with or near any electrical equipment?

±Yes ±No ±Don't Know

O19b. If yes, describe it (what kinds, how was it being used, how much was there, how close were they to you, and how often or many hours per week?)



CONSENT TO PARTICIPATE IN RESEARCH

**LIFETIME HISTORIES RESEARCH STUDY
(Breast Cancer Patient)**

You are asked to participate in a research study conducted by:

- **James T. Brophy**, PhD Candidate, Adjunct Faculty, Department of Sociology and Anthropology, University of Windsor (Co-Principle Investigator);
- **Margaret M. Keith**, PhD Candidate, Adjunct Faculty, Department of Sociology and Anthropology, University of Windsor (Co-Principal Investigator)
- **Dr. Hakam Abu-Zahra**, Windsor Regional Cancer Centre;
- **Michael Gilbertson**, Biologist, (retired);
- **Dr. Deborah Hellyer**, Occupational Health Clinics for Ontario Workers;
- **Dr. Peter Infante**, Occupational Epidemiologist (retired);
- **Dr. Isaac Luginaah**, Department of Sociology and Anthropology, University of Windsor;
- **Dr. Eleanor Maticka-Tyndale**, Department of Sociology and Anthropology, University of Windsor;
- **Robert Park**, Epidemiologist, Biostatistician;
- **Dr. Abraham Reinhartz**, Occupational Health Clinics for Ontario Workers;
- **Dr. Andrew Watterson**, University of Stirling.

The study is co-sponsored by the **Occupational Health Clinics for Ontario Workers (OHCOW)**, 171 Kendall, Pt. Edward, ON N7V 4G6 and is being conducted with the cooperation of the **Windsor Regional Cancer Centre (WRCC)**, 2220 Kildare, Windsor, Ontario N8W 2X3.

Funding for the study has been provided by **Canadian Breast Cancer Foundation; Breast Cancer Society of Canada; Green Shield Foundation; Private Donations**

If you have any questions or concerns about the research, please feel to contact: **James Brophy** or **Margaret Keith**, Ph: (519) 974-2979.

PURPOSE OF THE STUDY

The purpose of this study is to explore the possible relationships between a range of factors with the risk of developing breast cancer in order to develop strategies for prevention. When all known risk factors and characteristics are added together, more than 50% of breast cancer cases remain unexplained. Over a three-year period we plan to interview approximately 1,000 breast cancer patients and 1,000 non-patients from the local community.

Appendix HH

PROCEDURES

If you volunteer to participate in this study a trained researcher will ask you questions that will include your medical, personal, family, occupational, smoking, alcohol, and residential history. The questions are related to known and suspected breast cancer risks along with some that are exploratory. The entire one-time interview will take approximately one hour to complete and will require your prior signed consent. The interview can be scheduled at a time and place that is convenient for you. If necessary, the interview can be conducted by telephone. Information from your medical record pertaining to your diagnosis (i.e. date of diagnosis, pathology information) will be included with your history data.

POTENTIAL RISKS AND DISCOMFORTS

There are no direct medical risks to you if you participate in this study. However, if the interview in any way creates emotional discomfort, please let the interviewer know or, if you have concerns following the interview, please call the supportive care department of the Windsor Regional Cancer Centre at (519) 253-5253 ext. 58652. Alternatively, the project research staff can provide you with a list of supportive care services available in the community.

POTENTIAL BENEFITS TO SUBJECTS AND/OR TO SOCIETY

If you agree to participate in this study, there will be no medical benefit to you. However, it is hoped this study will benefit others by providing information that will lead to prevention.

PAYMENT FOR PARTICIPATION

You will be given **\$20.00** for your participation in the study.

CONFIDENTIALITY

Any information that is obtained in connection with this study and that can be identified with you will remain confidential and will be disclosed only with your permission. All identifiable information produced and collected by this study will be kept in a secure location and will be destroyed upon completion of the study. To ensure your privacy is maintained, your information will be identified by a study code only. Your name will not be attached in any way to the history data you provide; nor will it be entered into the study database; nor will it appear in any published reports. Your lifetime history record, minus personal identifiers, will be shared only with researchers and personnel involved in this study. You can ask to see your record at any time. You can choose to withdraw from the study and remove your data from the study at any time. All study researchers and personnel have signed pledges of confidentiality.

PARTICIPATION AND WITHDRAWAL

You can choose whether to be in this study or not. If you volunteer to be in this study, you may withdraw at any time without consequences of any kind. You may exercise the option of removing your data from the study. You may also refuse to answer any questions you don't want to answer and still remain in the study. The investigator may withdraw you from this research if circumstances arise which warrant doing so.

Appendix HH

RIGHTS OF RESEARCH SUBJECTS

This study has been reviewed and received ethics clearance through the University of Windsor Research Ethics Board and the Windsor Regional Cancer Centre Ethics and Clinical Trial committees. If you have concerns or complaints regarding the study, you can contact the co-principal investigators: James Brophy or Margaret Keith (519) 974-2979. Your concern will be documented and every effort will be made to resolve the issue. If your concern is not resolved, or if you have questions regarding your rights as a research subject, contact:

- Research Ethics Co-ordinator (Telephone: 519-253-3000, #3916), University of Windsor, Windsor, Ontario, N9B 3P4, Email: ethics@uwindsor.ca
- Windsor Regional Cancer Centre Research Ethics Board (Telephone: 519-253-5253, #58642), 2220 Kildare Road, Windsor, Ontario, N8W 2X3

SIGNATURE OF RESEARCH SUBJECT

I understand the information provided for the "LIFETIME HISTORIES RESEARCH STUDY" as described herein. My questions have been answered to my satisfaction, and I agree to participate in this study. I have been given a copy of this form.

Check here if you authorize access to your medical record for information pertinent to your diagnosis as explained.

Name of Subject

Signature of Subject

Date

And check here if you also agree to have your data used in subsequent studies. You may withdraw them later from subsequent use if you wish.

SIGNATURE OF INTERVIEWER

In my judgement, the subject is voluntarily and knowingly giving informed consent to participate in this research study.

Signature of Interviewer

Date



CONSENT TO PARTICIPATE IN RESEARCH

**LIFETIME HISTORIES RESEARCH STUDY
(Community Participant)**

You are asked to participate in a research study conducted by:

- **James T. Brophy**, PhD Candidate, Adjunct Faculty, Department of Sociology and Anthropology, University of Windsor (Co-Principle Investigator);
- **Margaret M. Keith**, PhD Candidate, Adjunct Faculty, Department of Sociology and Anthropology, University of Windsor (Co-Principal Investigator)
- **Dr. Hakam Abu-Zahra**, Windsor Regional Cancer Centre;
- **Michael Gilbertson**, Biologist, (retired);
- **Dr. Deborah Hellyer**, Occupational Health Clinics for Ontario Workers;
- **Dr. Peter Infante**, Occupational Epidemiologist (retired);
- **Dr. Isaac Luginaah**, Department of Sociology and Anthropology, University of Windsor;
- **Dr. Eleanor Maticka-Tyndale**, Department of Sociology and Anthropology, University of Windsor;
- **Robert Park**, Epidemiologist, Biostatistician;
- **Dr. Abraham Reinhartz**, Occupational Health Clinics for Ontario Workers;
- **Dr. Andrew Watterson**, University of Stirling.

The study is co-sponsored by the **Occupational Health Clinics for Ontario Workers (OHCOW)**, 171 Kendall, Pt. Edward, ON N7V 4G6 and is being conducted with the cooperation of the **Windsor Regional Cancer Centre (WRCC)**, 2220 Kildare, Windsor, Ontario N8W 2X3.

Funding for the study has been provided by **Canadian Breast Cancer Foundation; Breast Cancer Society of Canada; Green Shield Foundation; Private Donations**

If you have any questions or concerns about the research, please feel to contact: **James Brophy or Margaret Keith**, Ph: (519) 974-2979.

Appendix II

PURPOSE OF THE STUDY

The purpose of this study is to explore the possible relationships between a range of factors with the risk of developing breast cancer in order to develop strategies for prevention. When all known risk factors and characteristics are added together, more than 50% of breast cancer cases remain unexplained. Over a three-year period we plan to interview approximately 1,000 breast cancer patients and 1,000 non-patients from the local community.

PROCEDURES

If you volunteer to participate in this study, a trained researcher will ask you questions that will include your medical, personal, family, occupational, smoking, alcohol, and residential history. The questions are related to known and suspected breast cancer risks along with some that are exploratory. The entire one-time interview will take approximately one hour to complete and will require your prior signed consent. The interview can be scheduled at a time and place that is convenient for you. If necessary, it can be conducted by telephone.

POTENTIAL RISKS AND DISCOMFORTS

There are no direct medical risks to you if you participate in this study. However, if the interview in any way creates emotional discomfort, please let the interviewer know or, if you have concerns following the interview, please call the supportive care department of the Windsor Regional Cancer Centre at (519) 253-5253 ext. 58652. Alternatively, the project research staff can provide you with a list of supportive care services available in the community.

POTENTIAL BENEFITS TO SUBJECTS AND/OR TO SOCIETY

If you agree to participate in this study, there will be no medical benefit to you. However, it is hoped this study will benefit others by providing information that will lead to prevention.

PAYMENT FOR PARTICIPATION

You will be given **\$20.00** for your participation.

CONFIDENTIALITY

Any information that is obtained in connection with this study and that can be identified with you will remain confidential and will be disclosed only with your permission. All identifiable information produced and collected by this study will be kept in a secure location and will be destroyed upon completion of the study. To ensure your privacy is maintained, your information will be identified by a study code only. Your name will not be attached in any way to the history data you provide; nor will it be entered into the study database; nor will it appear in any published reports. Your lifetime history record, minus personal identifiers, will be shared only with researchers and personnel involved in this study. You can ask to see your record at any time. You can choose to withdraw from the study and remove your data from the study at any time. All study researchers and personnel have signed pledges of confidentiality.

Appendix II

PARTICIPATION AND WITHDRAWAL

You can choose whether to be in this study or not. If you volunteer to be in this study, you may withdraw at any time without consequences of any kind. You may exercise the option of removing your data from the study. You may also refuse to answer any questions you don't want to answer and still remain in the study. The investigator may withdraw you from this research if circumstances arise which warrant doing so.

RIGHTS OF RESEARCH SUBJECTS

This study has been reviewed and received ethics clearance through the University of Windsor Research Ethics Board and the Windsor Regional Cancer Centre Ethics and Clinical Trial committees. If you have concerns or complaints regarding the study, you can contact the co-principal investigators: James Brophy or Margaret Keith (519) 974-2979. Your concern will be documented and every effort will be made to resolve the issue. If your concern is not resolved, or if you have questions regarding your rights as a research subject, contact:

- Research Ethics Co-ordinator (Telephone: 519-253-3000, #3916), University of Windsor, Windsor, Ontario, N9B 3P4, Email: ethics@uwindsor.ca
- Windsor Regional Cancer Centre Research Ethics Board (Telephone: 519-253-5253, #58642), 2220 Kildare Road, Windsor, Ontario, N8W 2X3

SIGNATURE OF RESEARCH SUBJECT

I understand the information provided for the study "Lifetime Histories Research Study" as described herein. My questions have been answered to my satisfaction, and I agree to participate in this study. I have been given a copy of this form.

Name of Subject

Signature of Subject

Date

And check here if you also agree to have your data used in subsequent studies. You may withdraw them later from subsequent use if you wish.

SIGNATURE OF INTERVIEWER

In my judgement, the subject is voluntarily and knowingly giving informed consent to participate in this research study.

Signature of Interviewer

Date

WHO IS DOING THIS STUDY?

Co-Principal Investigators:

James T. Brophy, PhD Candidate, Adjunct Faculty, University of Windsor

Margaret M. Keith, PhD Candidate, Adjunct Faculty, University of Windsor

Co-Investigators: (in alphabetical order)

Dr. Makam Abu-Zahra, Windsor Regional Cancer Centre

Michael Gilbertson, Biologist (retired)

Dr. Deborah Hilgier, Occupational Health Clinics for Ontario Workers

Dr. Peter Infante, Occupational Epidemiologist (retired)

Dr. Isaac Liguori, University of Windsor

Dr. Eleanor Mallick-Indata, University of Windsor

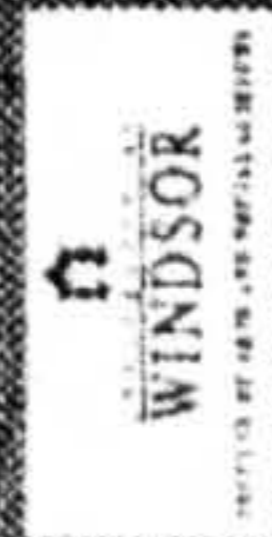
Robert Park, Epidemiologist, Biostatistician

Dr. Abraham Reinhardt, Occupational Health Clinics for Ontario Workers

Dr. Andrew Waterson, University of Stirling

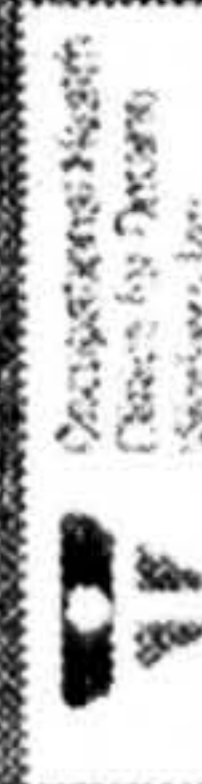
Host Institution:

University of Windsor,
Department of Sociology,
401 Sunset,
Windsor, ON N9B 3P4



Co-Sponsoring Organization:

Occupational Health Clinics for Ontario Workers (OHCOW),
171 Kendall,
Pt. Edward, ON



NTV AGB

RESEARCH FUNDING

Funding for this study was provided by:

- Canadian Breast Cancer Foundation
- Breast Cancer Society of Canada
- Green Shield Foundation
- Private Donations



FURTHER QUESTIONS OR CONCERNS

If you have questions or concerns about the study or would like to discuss a study-related appointment, please contact the research staff:

The study is being conducted with the cooperation of the Windsor Regional Cancer Centre, 2220 Kildare, Windsor, Ontario N8W 2Y3.

**TOWARDS
A BETTER
UNDERSTANDING
OF THE CAUSES OF
BREAST CANCER**

**Lifetime
Histories
Research Study**

**IF YOU HAVE
RECENTLY BEEN
DIAGNOSED WITH
BREAST CANCER
YOU CAN HELP
WITH A ONE-TIME
INTERVIEW!**

LIFETIME HISTORIES RESEARCH STUDY

WHY IS THIS STUDY BEING DONE?

The purpose of this study is to explore the possible relationships between a range of factors with the risk of developing breast cancer in order to develop strategies for *prevention*. When all known risk factors and characteristics are added together, more than 50% of breast cancer cases remain unexplained. Over a three-year period we plan to interview approximately 1,000 breast cancer patients and 1,000 non-patients from the local community.

WHAT IS INVOLVED?

If you volunteer to participate in this study a trained researcher will ask you questions that will include your medical, personal, family, occupational, smoking, alcohol, and residential history. The questions we are related to known and suspected breast cancer risks along with some that are exploratory. The entire one-time interview will take approximately one hour to complete and will require your prior signed consent. The interview can be scheduled at a time and place that is convenient for you. If necessary, the interview can be conducted by telephone. Information from your medical record pertaining to your diagnosis (i.e. date of diagnosis, pathology information) will be included with your history data.

WHAT ARE THE RISKS OF THIS STUDY?

There are no direct medical risks to you if you participate in this study. However, if the interview in any way creates emotional discomfort, please let the interviewer know or, if you have concerns following the interview, please call the supportive care department of the Windsor Regional Cancer Centre at (519) 253-5253 ext. 58652. Alternatively, the project research staff can provide you with a list of supportive care services available in the community.

WHAT ARE THE BENEFITS OF THIS STUDY?

If you agree to participate in this study, there will be no medical benefit to you. However, it is hoped this study will benefit others by providing information that will lead to prevention.

VOLUNTARY PARTICIPATION

Participation in this study is voluntary. You may refuse to participate, refuse to answer any questions or withdraw from the study at any time. If you choose not to take part or if you do not complete the interview your treatment, if any, will not be affected. If you choose to participate, you will be given a copy of your signed and dated consent form for your personal records. The original form will be kept in a secured file as a record of your participation.

PAYMENT FOR PARTICIPATION

You will be given **\$20.00** to help offset any costs or inconvenience resulting from your participation.

CONFIDENTIALITY

All identifiable information produced and collected by this study will be kept in a secure location and will be destroyed upon completion of the study. To ensure your privacy is maintained, your information will be identified by a study code only. Your name will not be attached in any way to the history data you provide; nor will it be entered into the study database; nor will it appear in any published reports. Your lifetime history record, minus personal identifiers, will be shared only with researchers and personnel involved in this study. You can ask to see your record at any time. You can choose to withdraw from the study and remove your data from the study at any time. All study researchers and personnel have signed pledges of confidentiality.

CONCERNS OR COMPLAINTS

If you have concerns or complaints regarding the study, you can contact the co-principal investigators: James Brophy or Margaret Keith (519) 337-4627. Your concern will be documented and every effort will be made to resolve the issue. If your concern is not resolved, you can contact the research ethics review personnel at either the University of Windsor (519) 253-3000 or the Windsor Regional Cancer Centre (519) 253-5253.



October 18, 2003

Dr. Maureen Muldoon
Chair, REB
University of Windsor
Windsor, Ontario
N9B 3P4
E-Mail: mhmul@uwindsor.ca

Re: Occupational Histories of Breast Cancer Patients

Dear Dr. Muldoon,

Thank you for your comments regarding our proposed amendments to the consent material. We are responding to the panel's suggestions as follows:

For the letter given by the physician to the potential subject. We are asking that you use the same format of information that is contained in the consent. Instead of what is currently under the signature of the research subject, you can use the "Referral to Lifetime Histories Research study" form.

The letter for the physicians (oncologists) to administer to the potential subjects is not intended to provide informed consent for participation in the study. The oncologists, who will administer the letter, do not have time to conduct the full informed consent process. At the oncologists' request, we provided a simple letter and signature form that is meant only for the patients to give permission to the WRCC to provide us with the patient name. Also at the oncologists' request, we provided an information brochure that contains the same information as is provided in the informed consent material (see attached). The oncologists would give the patient the information brochure to take away with her to read at her convenience.

We would then contact the patient to see if she would be interested in participating in the study. We would conduct the informed consent process prior to the interview to ensure that she is familiar with the information and in agreement with the terms.

This is the process that was agreed to by the WRCC oncologists and, in fact, as the oncologists are so taxed, we do not believe we can ask any more of them.

Please remove from that form the check box and the "I hereby decline at this time..." option. We also felt that you may want to include another assurance that this information will be kept confidential.

We included the check box and "I hereby decline..." wording at the oncologists' request. They wanted to be able to distinguish the patients who had declined from those the oncologists may not have yet approached. We have instead provided a small checkbox at the bottom of the form for the oncologist to use to indicate that the patient has declined (see attached).

Is it necessary for the physician to include his/her signature? We are not opposed to this practice, we just want an explanation of why it is necessary.

It is helpful for us to have the oncologists' signature. There are several oncologists at the WRCC and it would be important to know which ones are referring patients to the study as further communication or follow-up may be needed.

Consent: Contact phone number. Is that your home number? Is this what you want?

The telephone number for the research office will replace our home number. We do not yet have the new number yet but expect it will be assigned this coming week. The material will be printed with the office telephone number.

What is the affiliation of Michael Gilbertson?

Michael Gilbertson is retired from the International Joint Commission. We have added "retired" after Michael Gilbertson's name.

Under confidentiality (both forms) please remove the statement "This study has been approved....WRCC."

We have removed the above wording.

Under Participation and Withdrawal. Omit the last sentence in the paragraph. Include the following: "If you are receiving treatment, it will not be affected if you choose not to take part in this study."

We have omitted the sentence.

This is the process that was agreed to by the WRCC oncologists and, in fact, as the oncologists are so taxed, we do not believe we can ask any more of them.

Please remove from that form the check box and the "I hereby decline at this time..." option. We also felt that you may want to include another assurance that this information will be kept confidential.

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We have removed the above wording.

Under Participation and Withdrawal. Omit the last sentence in the paragraph. Include the following: "If you are receiving treatment, it will not be affected if you choose not to take part in this study."

We have omitted the sentence.

Under the Signature of the Research Subjects. The two check boxes. Can these be arranged in another way. It was felt that subjects may think that they are to choose one or the other. (Use an "and" or put the boxes at the end of the sentences.)

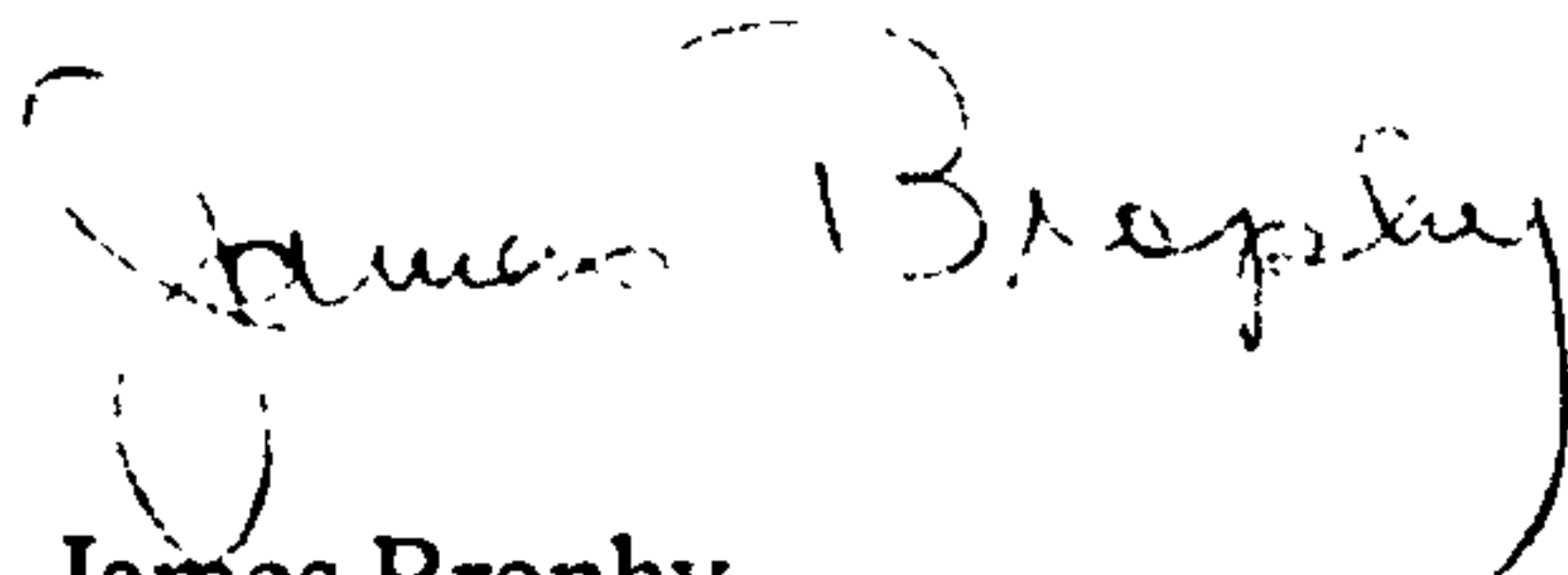
That is a good point. We have moved the statement and check box.

On both consents and initial contact letter, please remove the terms remuneration and stipend after \$20.

We have removed the terms stipend and remuneration.

Thank you so much for your thoughtful review. We have attached the changed material for the patients only. The same changes have been made for the community controls material where applicable. If further discussion or clarification is required you can email us or call 981-3566 (cell).

Sincerely,



James Brophy
jimbrophy@sympatico.ca



Margaret Keith
margkeith@yahoo.com

Appendix LL



May 20, 2003

Dr. Terry Sullivan
Cancer Care Ontario
620 University Avenue
Toronto, Ontario, Canada
M5G 2L7

Dear Terry,

Ruth Grier contacted me this evening regarding your earlier conversation. She said that there are apparently two outstanding issues with our research: the role of the University and my role as principal investigator.

Point #1: The University is the host institution and is administrating the grant. I am an adjunct faculty member in the Department of Sociology and Anthropology.

The University of Windsor submitted our application to the Canadian Breast Cancer Foundation, which I've attached to this message. The University is the "host institution" and is the recipient of the funding awards. It has opened up specific accounts for the grants and is currently paying our research associate, Ms. Nicole Mahler, from these accounts. If you require confirmation of this, then please feel free to contact Dr. Keith Taylor, the VP of Research for the University of Windsor. He is fully briefed about what is occurring with the WRCC regarding the research.

Point# 2: I am and will remain the principal investigator. It is not negotiable. I have devoted many years to the creation and sustaining of this research. Moreover, the funders can hardly be expected to agree to such an elemental change.

My role as principal investigator is defined by the research grants and approved by the University of Windsor research department and ethics committees. Moreover, it reflects reality. I was instrumental, along with others in the Occupational Disease Panel and the Occupational Health Clinic for Ontario Workers, in setting up the first occupational history collection project at the Windsor Regional Cancer Centre (WRCC) in 1995. I was also essentially co-principal investigator in the WSIB RAC funded study, although Kevin Gorey was formally listed as principal. Dr. Gorey had generously lent his name and CV to the project and participated in the early stages of the research. However, at his request, I essentially took on the role of principal investigator in order to free him up to concentrate on his own area of research, which is related to socio-economic status, not occupation. The WSIB RAC grant ended over a year ago. I have been principal investigator of the occupational history research since then, which we have been conducting through grants from the Windsor Essex County Cancer Foundation, the Green Shield Foundation and community contributions.

Appendix LL

I believe that in the course of almost 8 years of direct participation in the occupational histories research, I have developed sufficient experience and expertise to lead this project. Two separate scientific peer review panels evaluated the competency of our team and recommended its funding. I am currently preparing, as principal author, two papers on our just completed case control studies of female breast cancer and male head and neck cancer for submission to scientific journals. I can assure you that the scientific journals are not raising questions about my ability to prepare such findings or conduct such research, nor are the two scientific journals for which I am currently peer reviewing articles on case control studies on breast cancer and occupation. Finally, my PhD dissertation is a critical appraisal of the eight years of experience studying occupational associations and cancer causality.

In addition, we have renowned epidemiologists such as Dr. Peter Infante and Mr. Robert Park on our team. Both of these individuals are recognized experts in occupational epidemiology. Dr. Andrew Watterson, a respected academic from the United Kingdom and a research team member, has written widely on the issue of pesticides including the possible association with breast cancer.

I should not fail to mention the rest of this highly experienced multidisciplinary team that includes researchers, biologists, a medical geographer, occupational physicians and oncologists. It is a first rate group that brings a many skills and perspectives to this investigation. (They are listed on the attached grant application.)

Dr. Joseph La Dou, editor of the International Journal of Occupational and Environmental Health and one of the leading authorities of occupational medicine in the United States, has already written a letter to Dr. Brien regarding the competency of our research team and the importance of this undertaking. Dr. Devra Lee Davis and Dr. Samuel Epstein are both in the process of writing similar letters of support.

The WRCC has a commitment to support this research as it is now defined, with myself as principal investigator and with the University of Windsor as the host institution. Dr. Abu-Zahra, as the CEO of the WRCC, was a signatory on the successful grant application submitted to the Canadian Breast Cancer Foundation. In it, the WRCC agreed to provide access to patients, office space and provide interview space, etc. The fact that the new administration is not comfortable with this commitment is irrelevant. The commitment stands.

Sincerely,


Jim Brophy

**LOHR MEETING
MINUTES**

NOVEMBER 29, 2002

QUESTIONNAIRE

- Jim will talk to Dr Luginnah about the necessity and detail of the residential history and will report back
- Confirmed that I am asking whether the women are in the fields after spraying and whether they had access to protective equipment
- Interview documents must have version date

CBCRI/ RUTH GREIR

- the grant deadline for education funding mentioned by Ruth Grier has passed
- she is passing the published articles around and offering support
- Jim will forward a copy of the CBCRI 2002 peer review comments

WRCC/ DR CURTIS

- discussion of the published articles and publicity positive
- February 7/03 @ 12:00 scheduled for WRCC inservice on breast cancer study by Jim Brophy. Prostate and colon cancer to be scheduled.
- UWO medical school has interest in Lymphoma / Myeloma and will send students to address this issue
- Dr Caroline Hamm interested in pursuing Lymphoma / Myeloma / Leukemia study

U of W

- Jim stated that the U of W is pursuing a path independent of Brophy/Keith and are not falling over themselves to support Brophy/Keith research agenda
- Dr Deeley met with U of W and expressed concern that Brophy/Keith are advocates not scientists because of the way Brophy/Keith talks to the media. Jim feels that this research must be talked about.
- Dr Deeley / CCO thinks Jim is pro-union and out to embarrass government which is not on Brophy/Keith agenda.
- Dr Deeley implied that money may be made available to this research if Brophy/Keith were quiet
- Research not discussed publicly prior to peer review. The limitations of this research have been publicly acknowledged. Brophy/Keith recognize that they cannot state hard facts despite reoccurring studies that are published.
- Dr Curtis compared this research to that done by Dr Jonas Salk and the polio vaccine. That Brophy/Keith have done right by publishing despite the hungry media and the industry sensitive government.

**LOHR MEETING
MINUTES CONTINUED**

NOVEMBER 29, 2002

- CCO will be downloaded to the host hospital and there should be support at the WRCC in the future for this research
- LOEHR in a funding crunch project director's salary will run out January 31/02.
- The CAW locals have donated money approx. \$5,000.00 Brophy/ Keith using for expenses ie supplies
- The grant applications outstanding may not provide details about funding until February 2003.
- Imperative to find funding to continue longterm data collection at WRCC

MET ETHICS

- Brophy and Arukwe met with ethics committee protocol revisions for Tissue Pilot
- Nicole to follow up with Karen Anderson re amendments and forward to Jim
- Brophy/Keith concerned with tissue study becoming responsibility of LOEHR project director when no salary was written into the grant application by GLIER
- Project director committed to pilot during initial discussion with Dr Flynn and GLIER
- Important to maintain relationship with MET Hospital for future work

REPORT to WRCC

- Moyez Jadavji requires a report on the progress of the LOEHR study for the Foundation Board of Directors
- Nicole to report on status of data collection, student intern, website development, community outreach, newspapers etc forward to Jim

NEXT MEETING

- Dec 5/02 WRCC room 1001 @ 9:00
- Dec 12/02 WRCC room 1010 @ 9:00
- Dec 19/02 WRCC room 1010 @ 9:00
- A team meeting to be scheduled date to be announced.

Please Advise Nicole of any errors or omissions

Lifetime Histories Breast Cancer Research

Lifetime Occupational and Environmental History Record

Principal Investigators: James Brophy and Margaret Keith

**Co-Investigators: Abraham Reinhartz, Hakam Abu-Zahra, Michael Gilbertson,
Eleanor Maticka-Tyndale, Deborah Hellyer, Isaac Luginaah, Robert Park, Peter Infante, Andrew Watterson**

Why Study Breast Cancer?

Over the past 30 years, there has been an almost 1% annual increase of breast cancer incidence in Canada. The majority of breast cancer cases cannot be explained by known risk factors. One well-documented risk factor is estrogen. Some exogenous chemicals mimic estrogens (xenoestrogens) and disrupt the hormonal system. These, so-called "endocrine disruptors," such as some pesticides, PAHs, organic solvents, and components of plastics, may contribute to cellular proliferation and the cancer process. Animal tests have identified over 200 chemical substances that trigger breast cancer. Although such agents exist in many workplace environments, few epidemiological occupational breast cancer studies have been conducted in Canada to investigate their impact.

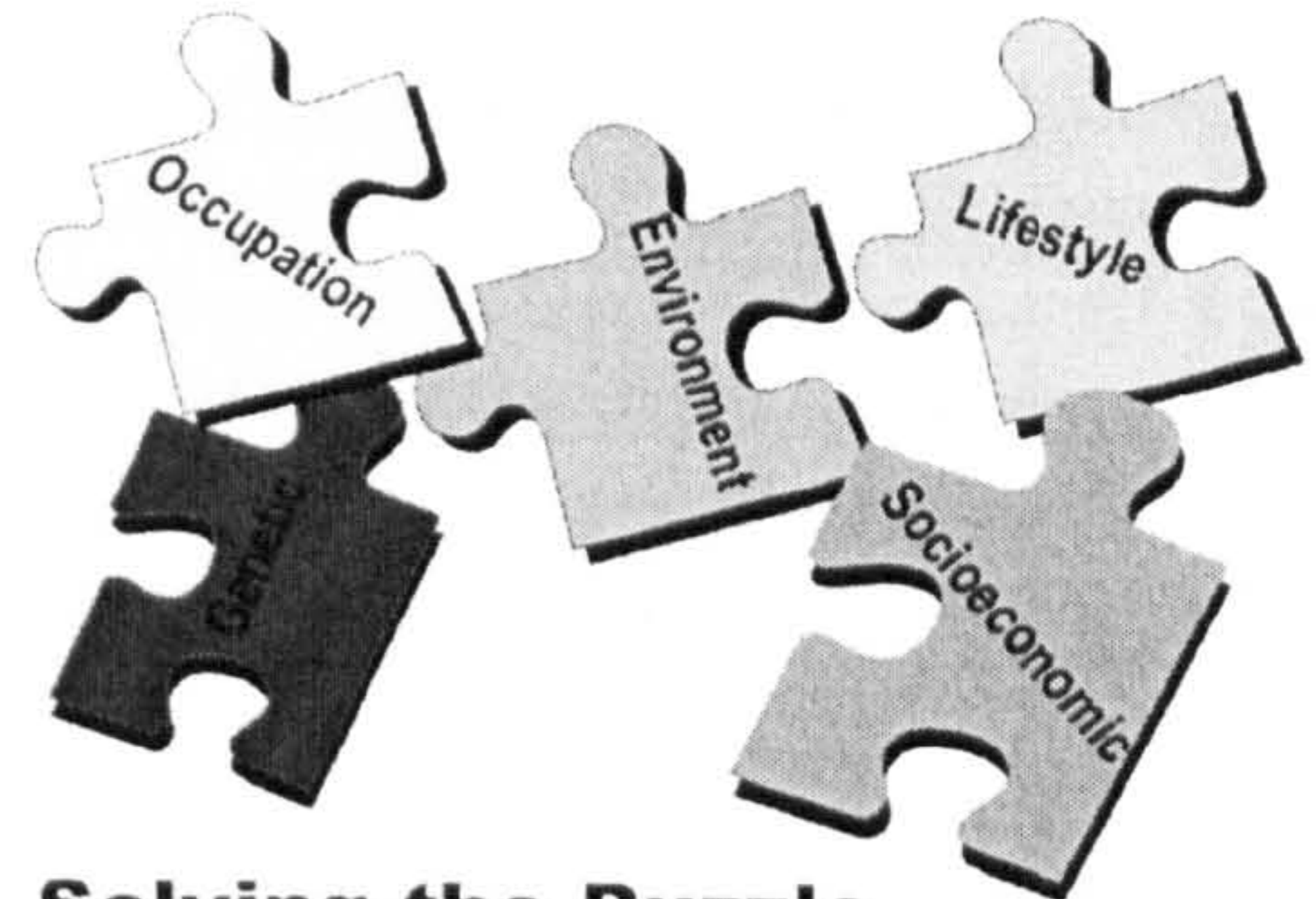


How is the Study Being Done?

Women living in the Essex-Kent county area who have been diagnosed with breast cancer since September 1, 2003 may be eligible to participate in this study. Over a three-year period we plan to interview approximately 1,000 breast cancer patients and 1,000 randomly selected women from the community who do not have breast cancer. The purpose of this study is to explore the possible relationships between a range of factors with the risk of developing breast cancer in order to develop strategies for prevention.

One-Time Interview

A trained researcher will ask patients and controls questions that will include medical, personal, family, occupational, lifestyle, and residential history. The questions are related to known and suspected breast cancer risks along with some that are exploratory. The entire one-time interview will take approximately one hour to complete and will require participants prior signed consent.



Solving the Puzzle

When all known risk factors and characteristics are added together, more than 50% of breast cancer cases remain unexplained.

Some of the literature suggests the increasing trend in breast cancer incidence is not linked to any one specific factor, but a variety or combination of factors: *environmental, occupational, genetic, lifestyle, and socioeconomic.*

Funding for Study

Funding for this study was provided by:

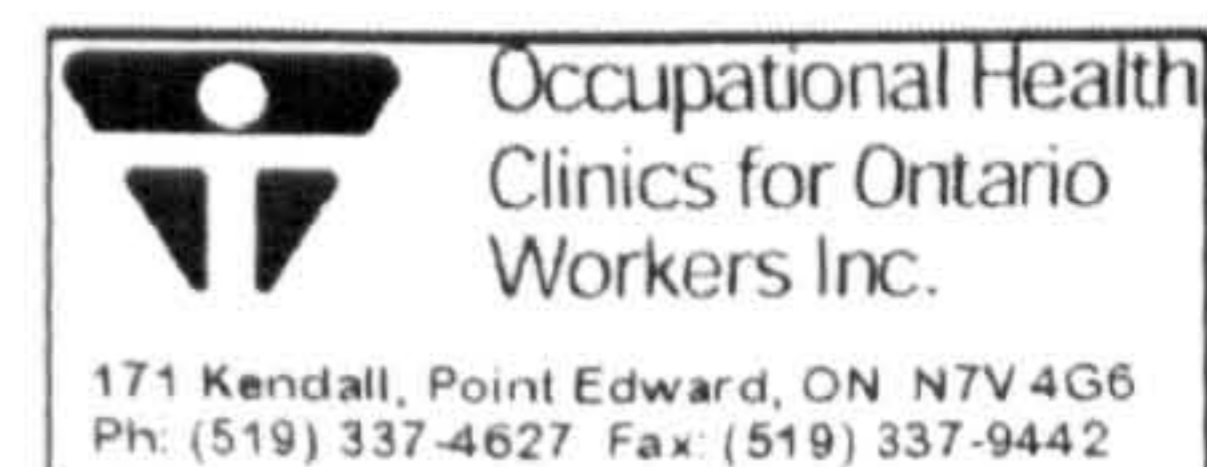
- Canadian Breast Cancer Foundation
- Breast Cancer Society of Canada
- Green Shield Foundation
- Donations



Host Institution

- University of Windsor

Sponsor



For more information contact Kathy Mayville, Ph: (519) 974-2979, Email: kmayville@lifetimehistories.ca
or Jim Brophy, Ph: (519) 337-4627, Email: jimbrophy@sympatico.ca



"LIFETIME HISTORIES RESEARCH STUDY"

Dear Patient:

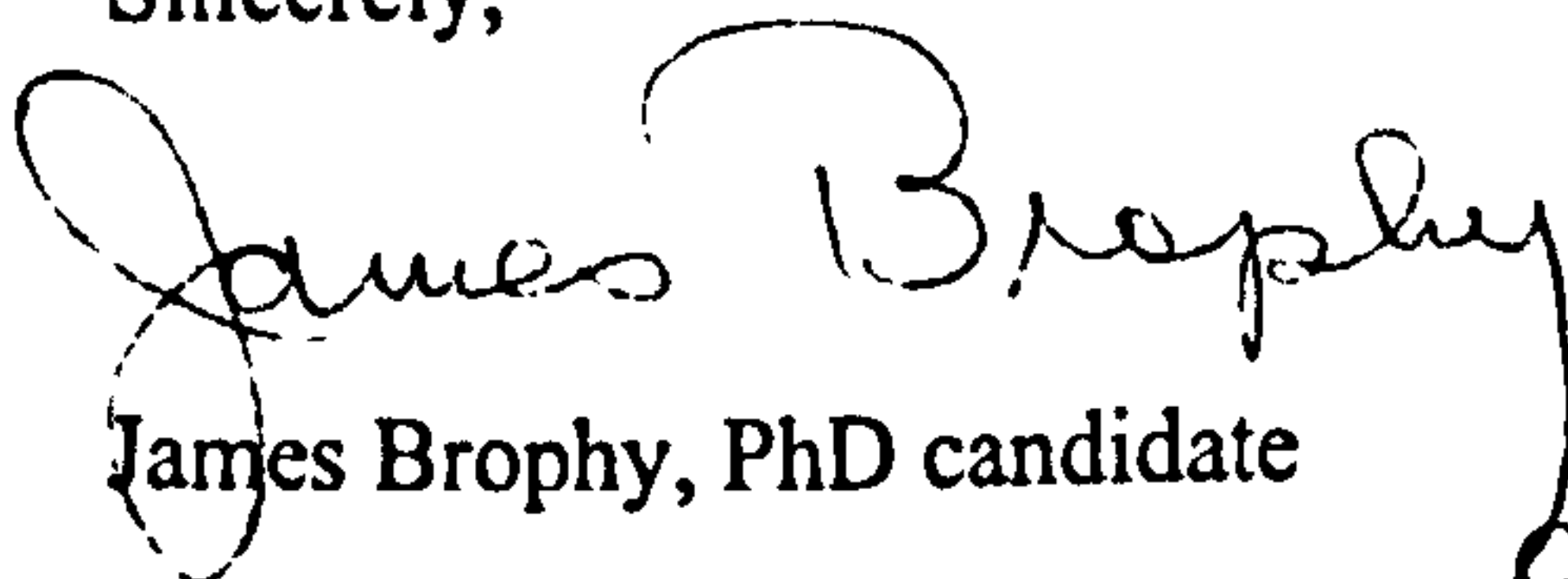
We are conducting a research study to explore potential **breast cancer risk factors**. This three-year project will involve approximately 1,000 female breast cancer patients and 1,000 non-patients from the local community. Our long-term goal is to better understand the causes of breast cancer in order to develop effective strategies to decrease risk, if possible. This study is sponsored by the University of Windsor and the Occupational Health Clinics for Ontario Workers (OHCOW) and is being conducted with the cooperation of the Windsor Regional Cancer Centre (WRCC).

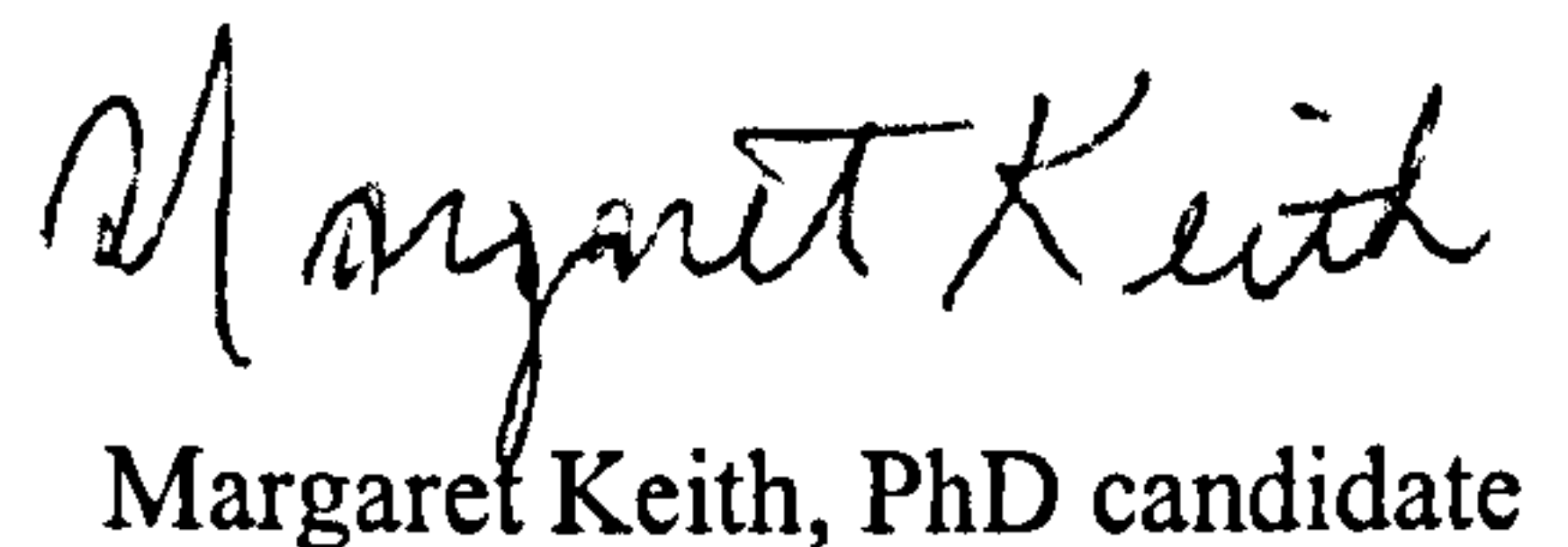
You can help. We are requesting that you participate in a one-time interview that will take approximately an hour to complete. A trained researcher will ask you questions that include your medical, personal, family, occupational, smoking, alcohol, and residential history. The questions are related to known and suspected breast cancer risks along with some that are exploratory.

The interview can be scheduled at a time and place that is convenient for you. If preferred, it can be conducted by telephone. All the information you provide will be kept in strict confidence and there will be no way to identify you in any published findings. You will be given \$20 for your participation.

If you are interested in hearing more about the study, you can sign the attached form and provide contact details (telephone, address). If you decide to participate, we can arrange an interview at your convenience. In the meantime, if you have any questions regarding this study, please contact: Ms. Kathy Mayville, Research Coordinator, at 974-2979.

Sincerely,


James Brophy, PhD candidate


Margaret Keith, PhD candidate

*Co-Principal Investigators,
Adjunct Faculty, University of Windsor*



Referral to "LIFETIME HISTORIES RESEARCH STUDY" Form

I understand that I will be provided with further information about the research before I decide whether or not I want to participate. I understand that this information will be kept confidential.

I hereby consent to permit the Windsor Regional Cancer Centre to provide my name and contact information to the designated research personnel involved in the Lifetime Histories Research Study.

Name (Please Print Clearly)

Signature

Address

Telephone Number

Today's Date

Signature of Physician

Patient declined at this time.

Breast Cancer Project

BREAST CANCER RESEARCH EXPLORES OCCUPATIONAL AND ENVIRONMENTAL RISKS

*by James Brophy & Margaret Keith
on behalf of the Research Team*

Over the past 30 years, there has been close to a 1% annual increase of breast cancer incidence in Canada. Considering all known risk factors, over 50% of breast cancer cases remain unexplained. Some studies suggest links to exposures that disrupt the endocrine system. Chemicals that "mimic" estrogens (xenoestrogens), such as some pesticides, polycyclic aromatic hydrocarbons, organic solvents and components of plastics, may contribute to cellular proliferation and the cancer process. Animal studies have identified over 200 chemical substances that trigger mammary tumours. Some of the scientific literature suggests the increasing trend in breast cancer incidence is not linked to any one specific factor, but a variety or combination of factors: environmental, occupational, genetic, lifestyle, and socioeconomic.

The timing of these exposures, particularly prenatal and childhood can be as important as dose. It is possible and plausible that female breast tissue may be more susceptible to tumor initiation and progression during periods of great morphological and biochemical change, i.e. beginning at puberty and continuing throughout the reproductive years. Thus, it is very important that other unknown and perhaps preventable causes of breast cancer especially within the environmental and occupational areas be explored.

This brief communication is intended to inform our area physicians of an ongoing local research study called the Lifetime Histories Research Study and by lending their support they may encourage their patients to be part of it.

The Lifetime Histories Research Study is exploring a broad range of possible breast cancer risk factors, including occupational and environmental exposures. With informed consent, a comprehensive questionnaire is administered by a trained interviewer to patients with breast cancer and to female community controls. The questionnaire captures data regarding traditional risk factors such as number of pregnancies and breast feeding; menstrual and menopausal history; use of hormone replacement therapy and oral contraceptives; family history data; indicators of socioeconomic status; physical activity; weight and body mass index; alcohol use; detailed lifetime occupational history (which will provide data for the assessment of exposures, including duration, dose, age when first exposed, etc.); residential history including proximity to environmental pollution sources; shift work and night work history; parental occupations and other indicators of prenatal and infant exposures; childhood exposures; smoking history (including second hand smoke); Great Lakes fish consumption; household exposures and hobbies. Exposure assessments will be made by an expert panel comprised of several members of the research team and staff from the Occupational Health Clinics for Ontario Workers (OHCOW), i.e. industrial hygienists and researchers.

The study uses "case-control study" methodology. In other words, data from cases is statistically compared to

data from controls to identify differences that may provide clues regarding risk. For example, if after controlling for confounders, it emerges that significantly more cases than controls have had a particular exposure it may be concluded that particular exposure is a potential risk factor.

It is projected that the three-year study will involve the collection of histories of 1,005 new breast cancer patients and 1,005 community controls.

The study is being conducted by a multi-disciplinary team of researchers that includes: James Brophy and Margaret Keith, co principal investigators; Dr. Hakam Abu-Zahra, Medical Oncologist; Dr. Deborah Hellyer, Respiriologist; Dr. Abraham Reinhartz, Occupational Physician; Dr. Eleanor Maticka-Tyndale, Sociologist; Dr. Isaac Luginaah, Medical Geographer; Michael Gilbertson, Biologist; and several internationally renowned Occupational Epidemiologists.

Funding for the study has been provided by the Canadian Breast Cancer Foundation and the Breast Cancer Society of Canada. It is hosted by the University of Windsor, co-sponsored by the Occupational Health Clinics for Ontario Workers and is being carried out in cooperation with the Windsor Regional Cancer Centre.

For more information or to refer a breast cancer patient to the study, please contact:

Ms. Kathy Mayville
Lifetime Histories Research Study, c/o Hospice,
Unit 500,
6038 Empress, Windsor, ON
N8T 1B5
Ph: (519) 974-2979
email: kmayville@lifetimehistories.ca

THE GLOBE AND MAIL
WINDSOR, ONTARIO, FEBRUARY 11, 1997

Data point to breast-cancer risk

Female farmers 55 or younger face higher incidence, new study suggests

BY MARTIN MITTELSTAEDT
ENVIRONMENT REPORTER

Women who have worked on farms are up to nine times as likely to develop breast cancer as those who have never been employed in agriculture, says a new study that is one of the first in Canada to look at the job histories of women who develop cancer.

The study found an elevated risk among women 55 or younger who reported working on farms at some point in their lives. It was based on research conducted in Windsor, Ont., and surrounding Essex County, one of Canada's largest fruit- and vegetable-growing regions.

Women treated at the Windsor Regional Cancer Centre from 1995 to 1999 were asked to fill out questionnaires on their work histories.

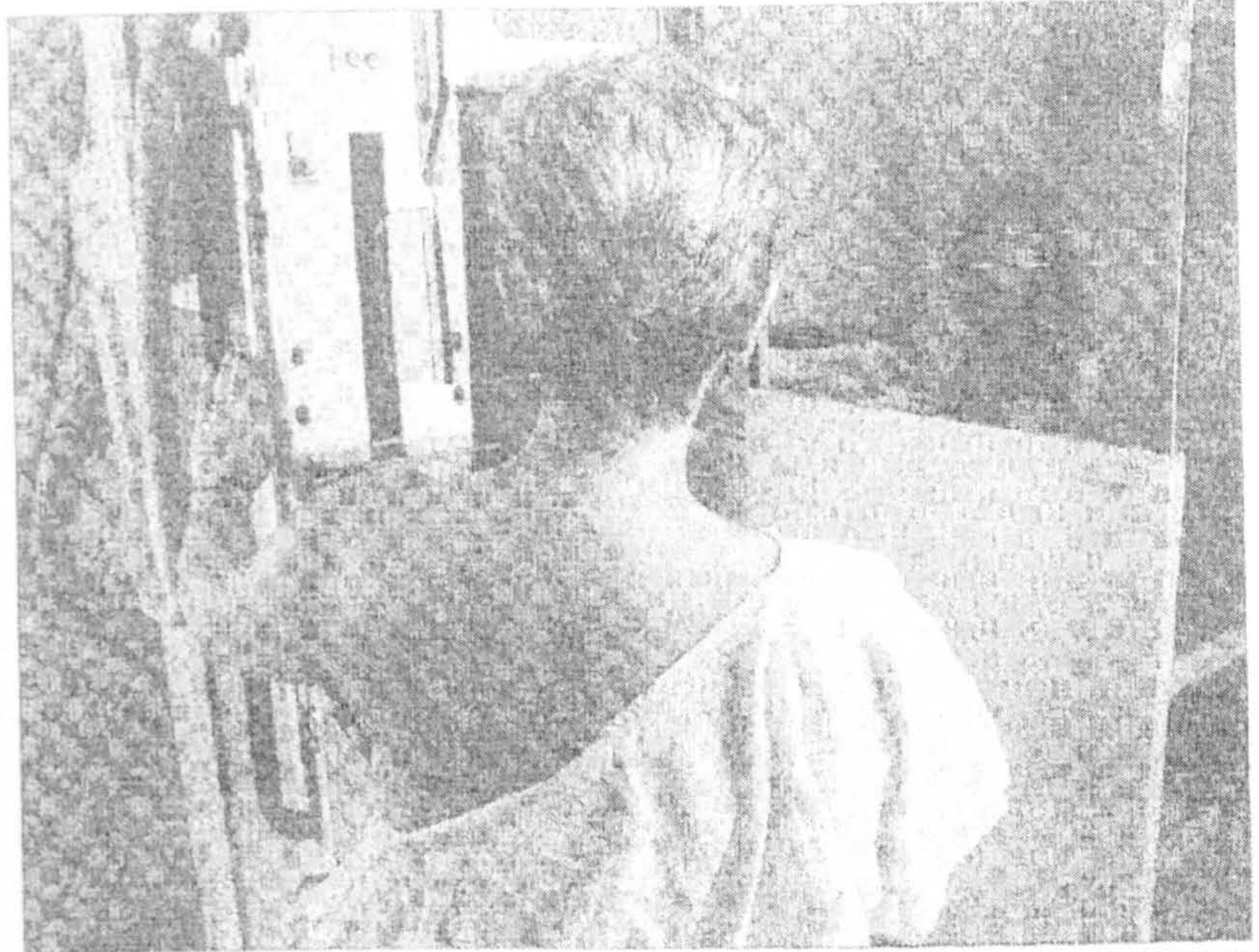
Although the study did not conclude definitively that pesticides cause breast cancer, one of the researchers said further work should be conducted to determine what it is about farming that would increase a woman's risk of the disease.

"We don't know from our study if it's pesticides or not," said James Brophy, an adjunct lecturer at the University of Windsor and the study's lead author. He added:

"There is good evidence for concern that pesticides would certainly be the primary substances under investigation."

The findings, published in the current issue of the *International Journal of Occupational and Environmental Health*, are likely to raise further suspicions that the array of toxic fungicides, herbicides and insecticides used on many farms is a factor in the huge increase in the rates of breast cancer.

Over the past three decades, the incidence of breast cancer among Canadian women, on farms and elsewhere, has inexplicably risen about 1 percent a year, according



A woman undergoes a mammogram. Just-published findings are likely to raise suspicions that the array of fungicides, herbicides and insecticides used on many farms plays a role in the rise in breast-cancer rates.



James Brophy wants further study of farming and cancer.

to the study.

In more than half the cases, the increase cannot be explained by well-known risk factors, such as a woman's genetic history, age of first pregnancy or high lifetime

exposure to estrogen.

Mr. Brophy speculated that teenaged girls and young women may be particularly vulnerable to pesticide exposure because breast tissue develops so rapidly from the time of a girl's first period to her first pregnancy, when cells prepare for lactation.

Genetic damage caused by pesticides in breast cells during this period of rapid cell growth could lead to breast cancer later in life, he said.

Farm women 56 and older did not show the higher incidence of breast cancer.

The study was conducted by a team of university researchers from Canada and Scotland, and from the International Joint Commission, the Canada-U.S. body that studies the environmental health of the Great Lakes region.

The study was not undertaken to investigate breast cancer, but was looking for general clues as to

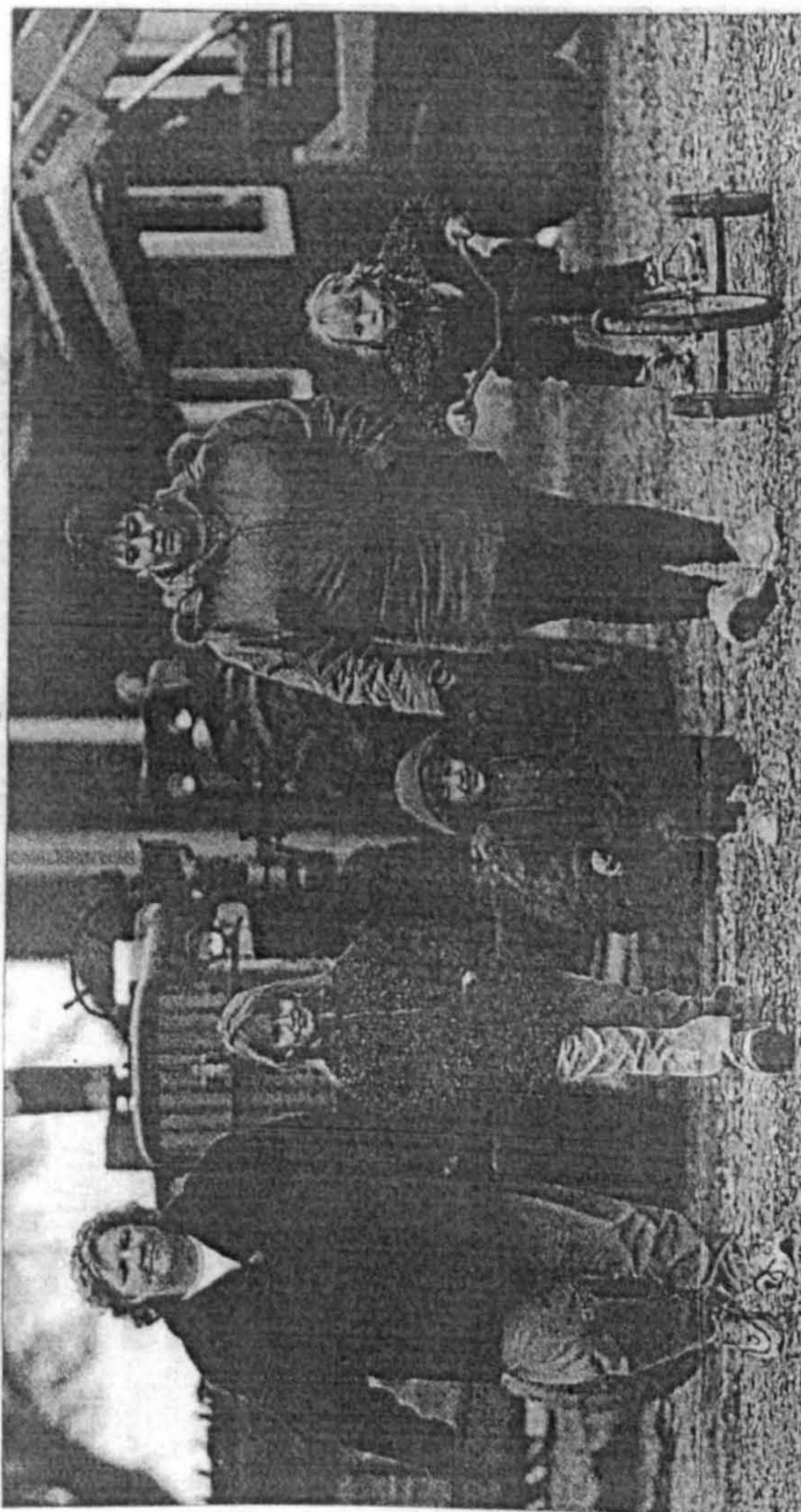
whether specific jobs were linked to different types of cancer. But the researchers quickly saw an association when they compared the lifetime occupational histories of the 299 women with newly diagnosed breast cancer to 237 women with other cancers.

The odds ratio, a scientific comparison designed to look for associations in data, found that women under 55 who had worked on farms had a risk of developing breast cancer nine times that of women who had not farmed.

A cancer expert cautioned that the study's results do not offer proof that pesticides cause breast cancer.

"I certainly wouldn't jump to the conclusion from this that farming exposure and in particular pesticides have been demonstrated to be a risk factor," said Richard Gallagher, head of cancer control research for the British Columbia Cancer Agency.

Farm wives warned of breast cancer risk



CANCER RISK: A study has found women in rural areas have a higher risk of cancer. Sherry Wright, right, and daughters Kaitlyn, 8, Mackenzie, 5, and Jordyn, 22 months, with friend Tracy Bothwell take a stroll on their Malden Centre farm.

Star photo: Dan Janisse

Further studies underway

By VERONIQUE MANDAL
STAR HEALTHSCIENCE REPORTER

Women involved in farming in Windsor and Essex County appear to have a much higher risk of developing breast cancer than non-farm women, according to research published in an international health journal.

A group of Windsor researchers, in cooperation with the Windsor Regional Cancer Centre, compared the lifetime occupational histories of 536 women with cancer.

Their results are published in the October

issue of the International Journal of Occupational Environmental Health.

"We found a nine-fold risk of breast cancer with women who had ever farmed, and they were under 55, which is also very significant," said James Brophy, one of the authors of the study.

"Results of a further study to be released in the coming months will also add further weight to these findings."

Brophy said they are approaching these results with caution. He said they are working on the results of a further study which incor-

porates more risk factors in the study of farm women with breast cancer.

Cancer centre chief Dr Hakim Abu-Zahra said future studies will provide more definitive answers to the role, occupations play in causing cancers.

Brophy says 50 to 70 per cent of breast cancer cases "cannot be explained by the current list of attributable causes" and "intense attention" must be given to the use of dangerous chemicals.

PLEASE SEE WOMEN WARNED / A12

A12 Wednesday, November 13, 2002

Women warned

CONTINUED FROM A1

Farm wives interviewed Tuesday said they were shocked with the findings and want to know more about the toxic effects of farm chemicals.

"My first question is how much do chemical companies know about the health risks of the products they sell us," said Sherry Wright, who lives on a dairy farm with her husband and

three small daughters.

"We now have to take a test and get a licence to use chemicals, and we know they're poison and dangerous, but we don't know why and what they could cause I want to know, for me and my girls."

Wright's friend, Tracy Bothwell, the mother of a young son and daughter, also lives on a dairy farm.

"People use protective clothing and

masks now, but until five years ago they put their bare arms in the stuff," said Bothwell. "We may not stop using the chemicals but we certainly want to know what we're up against."

Given the lower rates of many diseases, in what has been considered a healthier population, researchers say some of the cancer triggers could be exposure to pesticides, insecticides, herbicides, fumigants, fungicides, solvents and engine exhaust fumes.

Of particular concern, said Brophy, are chemicals which have the ability to disrupt the endocrine system and contribute to tumour development.

THE WINDSOR STAR

"The group includes organo-chlorine pesticides, polycyclic aromatic hydrocarbons, organic solvents and plastics," Brophy said.

The study says that farming may serve as "a proxy for direct or indirect pesticide exposure, for example, exposure to pesticide residues through handling agricultural products."

Studies connecting farming to breast cancer risks in women and prostate cancer risks for men are being published in the U.S. and in Britain.

A study of farming and breast cancer in North Carolina, found that women who reported being present in the fields

during or shortly after pesticide application had an 80-per-cent increased risk of developing breast cancer.

In British Columbia, a study reported a four-fold risk of breast cancer in women on vegetable farms, said Brophy.

British researcher Andrew Watters said that in England the major initiative for research came from farm women themselves.

They wanted to explore the number of breast cancer cases in their area, and are insisting on information so they can make decisions," said Watters.

The work being done in Windsor is very important."

June, 2003

Breast cancer rates in farm women cause alarm

Windsor and Essex occupational health study reveals elevated rates of occurrence.

By Heather Woodruff
Life on the farm is often viewed through Norman Rockwell-like scenes; apple-cheeked children working alongside their mothers and fathers to produce an abundant harvest. But a recent study may shatter that picture.
Jim Brophy of Occupational Health Clinic for Ontario Workers and even other researchers recently studied 299 women under 45 who were diagnosed with

breast cancer in Windsor and Essex county. They found women who were on the farm or who had any history of farming were nine times more likely to have breast cancer than their non-agricultural counterparts.
"The steady increase in the incidence of breast cancer in Canada suggests exposures to occupational and environmental agents play a role in genesis of the disease," Brophy writes in the report. "Over the last 30 years there has been an almost one per cent annual increase of breast cancer incidence in Canada... the majority of breast cancer cases cannot be explained by the current list of attributable risks."

Pat Brophy does have one idea what the cause may be: pesticides.
"There have been at least two studies that have been published, one in Canada, one in the States - that looked at breast cancer in agriculture... they found an elevated risk for women working in the fruit and vegetable and crop farming areas," he told The Voice of the Farmer.

Brophy says young women - from puberty to childbearing years - may be at particular risk. Breast cells haven't fully developed until after childbirth and may be more susceptible to pesticides which cause estrogen found in a woman's body.

"Pat they haven't made a definitive link between pesticides and breast cancer," he noted.
It's a finding that has worried researchers so much they've launched another study to try to pinpoint the cause. The results of it should be released in six months.
Brophy is also hoping to talk to farm women about what sort of chemicals they were exposed to and in what quantity (if any) and in what way. He's helping with this by contacting Brophy at brophy@sympatico.ca.

"Historically people in the agricultural areas were considered to be healthier than those in urban areas... however there is increasing information

that this is a population with an increased risk of cancer. These studies, while they may not be conclusive and they may not point to a certain agent, they are cause for concern," says Brophy.
Jennifer Wilson would agree. The Chatham-Kent farmer, who is also a member of the Chatham-Kent Health Alliance board of directors, says the study's findings are pretty discouraging.
"Farming is about the three meals you eat a day... the production of safe, healthy food is about the three meals you eat a day. To think we (farmers) may have sacrificed our health for it is discouraging," says Wilson.

She added the

increased risk is under standable since farming is one of the few occupations where people work where they live. "You've have so much that doubles up the environmental contaminants."

Wilson says until now the specter of the pesticides used on the farm causing health problems wasn't one of her main concerns. "You think about the spectacular things like tractors rollovers - you think about these (risks) every day... but you think if you follow the (environmental and manufacturers) rules for pesticides, you'd be safe. I find this even more of a concern as a mother for my daughters," says Wilson.

Continued on page 14

Study results are worrisome: researcher

Continued from front

It's a worry Brophy shares. "There are two areas of the study that we did in Windsor and Essex I'm concerned about. Women started working at an extremely young age - 12 and 13 years old - on the farm, which I take to be a common experience . . . (They) are very vulnerable to damage from exposure to cancer causing agents," says Brophy.

"The other thing we know now is that exposure

to chemicals during pregnancy or just before pregnancy shows that prenatal exposure may have a big risk on people later in life."

As the study into the link between breast cancer and farming continues, Brophy is urging public health authorities to act now to prevent further suffering down the road.

"This is the dilemma of cancer prevention. I've been focusing on breast cancer for sometime now and the more I read about it the

more disturbed I become. Twenty thousand women will develop breast cancer and 5,000 will die this year and the majority are not explained.

"This really cries out for a major health intervention . . . I think public health should tell people what's going on on farms."

He points to how health officials responded when information was beginning to come out about the links between lung cancer and smoking as an example of how prevention plans should proceed in the farm community.

"There is increasing evidence of disease, breast cancer being one of them, being caused by environmental factors. Health agencies and government ministries should be having serious discussions on strategies on how to deal with this."

For now, Brophy is urging women to be cautious at work on the farm. "Don't spray unprotected, pregnant women should not be present when spraying is going on and . . . farmers should be very careful of their children and (especially) their daughters."

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WINTER 2004

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EDUCATE YOURSELF

BCAK is pleased to announce an exciting agenda for its annual Education Night. On April 22, 2004, epidemiological researchers Margaret Keith and Jim Brophy of the University of Windsor will speak to our Kingston audience on breast cancer and the environment. Their talk, "Occupational

BCAK EDUCATIONAL NIGHT
Occupational and Environmental
Risk Factors for Breast Cancer
Thursday, April 22, 2004
7:00 pm
Ongwanada Resource Centre
191 Portsmouth Ave., Kingston

and Environmental Risk Factors for Breast Cancer," will deal with their cutting-edge investigations into cancer and the workplace and the broader environment and will be followed by a question-and-answer period.

Widely published authors and well-known activists, Brophy and Keith are doctoral candidates at the University of Stirling in Scotland. Both have long careers with the Occupational Health Clinics for Ontario Workers in Windsor, Ontario, where Brophy is the executive director. Brophy

was also a finalist in the category of Environmental Health in the Canadian Environment Awards, which is a national awards program that recognizes community-based environmentalists. Keith's research focuses on at-risk mapping and breast cancer.

What's Inside?

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BCAK Library — p. 4
BCAK News — p. 5-8

CALENDAR OF EVENTS

Spring 2004

March 1
Support Group
5:30-7:00 p.m.
at the BCAK office

March 10
Walk Meeting
5:30 p.m. at the BCAK office

March 15
Support Group
5:30-7:00 p.m.
at the BCAK office

March 24
Board Meeting
5:00 p.m. at the BCAK office

March 29
Support Group
5:30-7:00 p.m.
at the BCAK office

April 22
Educational Evening
Ongwanada Resource Centre,
191 Portsmouth at 7:00 p.m.
Guest speakers are Jim Brophy
and Margaret Keith. Their
topic is "Occupational and
Environmental Risk Factors
for Breast Cancer"

May 8
Walk for Awareness: Walk
Together, Celebrate Life

The information contained in this newsletter is not a replacement for professional medical attention. Breast Cancer Action Kingston (BCAK) strongly encourages each of its readers to talk to a physician or health-care team to make informed medical decisions. BCAK accepts no responsibility for actions taken as a result of information or materials referred to in its newsletter. BCAK is a volunteer organization that lacks the expertise to research questions of a medical or scientific nature.