

IN TUNE

Cancer incidence in Quebec from 1989 to 1993

CHUQ public health researchers have completed a descriptive study of the incidence of cancer in Quebec for the period from 1989 to 1993. We will present some of the study's findings.

Meteorology serving the needs of agriculture

CIPRA, a new software developed by Agriculture and Agri-food Canada in co-operation with Environment Canada's Meteorology Division, is providing farmers with invaluable information.

ZIPs

In 1994, a campaign was launched to have the Magdalen Islands recognized as an Area of Prime Concern, known in French as a ZIP, or zone d'intervention prioritaire. In December 1998, the islands were recognized as a distinct territory for conservation purposes by Stratégies Saint-Laurent, and a provisional ZIP committee was formed.

The incidence of Cancer in Quebec from 1989 to 1993 – Descriptive Study

Knowledge of the geographical distribution of disease is very useful in public health. This information is used to study associations between various environmental factors or specific population characteristics and the frequency of diseases. The purpose of this article is to describe some of the conclusions drawn from the work carried out by a team from the Centre de recherche du Centre hospitalier universitaire de Québec (CHUQ), a Quebec City university hospital research centre. Their work led to the preparation of the first Quebec atlas illustrating the geographical distribution of the incidence of different types of cancer in CLSC (local community service centre) regions.

A descriptive study of the incidence of cancer in Quebec from 1989 to 1993 was conducted by researchers from the public health research unit at the CHUQ research centre. The purpose of the study, which was funded under the Health component of the St Lawrence Vision 2000 Action Plan, was to study geographical variations in the incidence of the most common cancers in Quebec.

A number of cancer sites were considered: stomach, colorectal,

pancreatic, lung, liver, kidney, breast, uterine and prostate cancer, leukemia, non-Hodgkin's lymphoma and all malignant tumour sites. The study covered the entire province of Quebec except for Nunavik, Northern Quebec and the James Bay Cree Lands.

To present the geographical distribution of the incidence of cancer, the authors used the dynamic concept of atlas foldouts. A total of 22 foldouts illustrate the results in the form of maps, text, tables and graphs. Germain Lebel, who was in charge of the study, said that "Analysed in light of regional knowledge, these data will identify public and environmental health trends in Quebec's health and social services regions." The CHUQ's

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research centre has thus given an additional tool to the regions, which may have difficulty finding the resources needed to conduct studies of this scope.

A Relatively Homogeneous Geographical Distribution of Cancer Incidence

The analysis showed that the geographical distribution of cancers is relatively homogeneous throughout the study area. However, when all cancer sites were grouped together, very slight excesses in the incidence of cancer were observed in men and women on the North Shore and in the Saguenay–Lac St Jean region.

The geographical distribution analysis for all cancer sites also showed slightly lower rates in the Outaouais and Chaudière-Appalachiens regions than for the study area as a whole.

The Research Team's Focus: the St Lawrence River

Although CLSC regions were the main units selected for the analyses, the research team also compared the incidence of cancer in different combinations of municipalities. The municipalities were grouped together according to three environmental characteristics: types of drinking water treatment (chlorination vs other types of treatment), sources of drinking water (the St Lawrence vs other sources of supply) and the proximity of the St Lawrence River (riverside

municipalities vs other municipalities).

According to the study's findings, there was no significant excess of cancer in populations along the St Lawrence River compared to non-riverside populations. Similar results were also obtained when incidence rates were compared for municipalities that take their water from the St Lawrence and those that have another source of supply.

However, the analysis did show a slight significant excess for liver cancer in municipalities where 81% or more of the population drank chlorinated water compared to municipalities that use another form of water treatment. "Our conclusions, which are consistent with those of other recent Canadian studies, confirm the relevance of officials' current thinking on standards applicable to chlorinated by-products in drinking water," explained Mr Lebel. The Quebec Department of the Environment is expected to announce amendments to drinking water regulations in the near future.

Connections between the Incidence of Cancer and Population Characteristics

Associations between cancer incidence rates and specific population characteristics were also studied. For example, there was a significant positive correlation between educational level and the incidence rate of breast cancer in women by CLSC territory¹. Similarly, a negative correlation was found

between educational level and the incidence of lung cancer in men. A positive correlation was also observed between household income and the rate of prostate cancer in men while negative correlations were detected between income and the incidence rates of lung cancer in men and women. In addition, correlation analyses showed positive associations between the proportion of smokers and the incidence rates of lung cancer in men and women, and with the incidence of cancer of the kidney in women.

However, any overall interpretation of the results has to be a cautious one as some of the main individual risk factors for cancer (exposure to carcinogens in the work place, smoking, genetic predispositions, etc) were not considered in the analysis of the data. Moreover, because of the study's long time frame (five years) and large population, very weak significant excess risks can be detected, which should be studied with caution

¹ A correlation is positive when the values of one variable increase on average with the values of another variable. Thus, in this example, the greater the educational level, the higher the incidence of cancer. In a negative correlation, the values of one variable decrease while those of another increase.

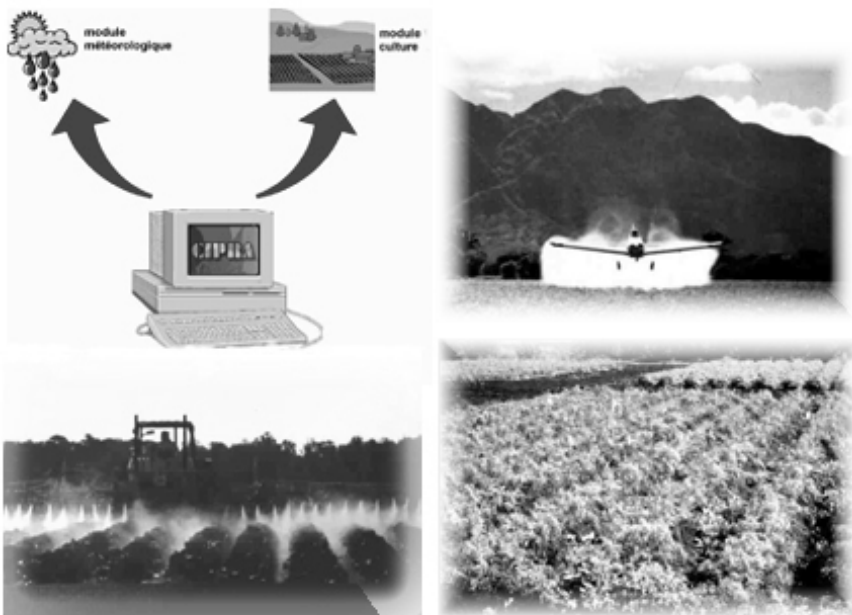
Source:

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Meteorology serving the needs of agriculture



Photos : Agriculture Canada

The agriculture-related objectives of Phase III of the St. Lawrence Vision 2000 Action Plan include reducing the quantities of pesticide used and broadening integrated management of crop pests. To achieve those objectives, it will be necessary to adapt certain agricultural practices. Increasingly specialized tools are becoming available for that purpose, such as the pest forecasting system profiled here.

For Quebec farmers, who number more than 32,000, managing an agricultural enterprise involves numerous day-to-day challenges, including producing commodities that satisfy consumer demands related to quality and price, maintaining soil productivity and overcoming stiffer competition.

Mindful of the importance of protecting the environment, farmers must strive to preserve their crop yields and plan their production in relation to market requirements. Yields can be threatened by the presence of insect pests and disease organisms, which, in addition to diminishing output, can alter the appearance of agricultural commodities.

Various control measures, such as pesticide applications, are implemented to boost crop yields and meet the demands of the marketplace. Producers need to know the best time to apply pesticides to ensure optimal efficiency

and minimize the adverse environmental effects. For guidance, today's farmers have access to more and more powerful decision-support tools, such as the CIPRA (Centre informatique de prévision des ravageurs en agriculture) software.

A reliable diagnosis...

Designed by Agriculture and Agri-Food Canada, CIPRA comprises a series of mathematical models for monitoring various insect pests and disease-causing organisms that pose a threat to agricultural crops. The models analyse factors such as conditions favourable to the appearance of insect pests and disease organisms, development cycles and suitable treatment periods. Environment Canada weather forecasts and meteorological data are integral to their functioning.

"We provide detailed meteorological observations for users of CIPRA software, including temperature, humidity conditions and precipitation in real time," said Gaéтан Deaudelin, of Environment Canada's Meteorology Division. The models compile these data from the start of the season, using them to predict the emergence of an insect pest or a disease-causing fungus, for example. With this information, producers can plan the steps that need to be taken to eliminate crop pests, before they cause too much damage.

...and a prognosis to guide action

This capability is what makes CIPRA stand out from the other software programs on the market. "In addition to using meteorological data to diagnose the infestation risks for given crops, CIPRA analyses the weather forecasts for the next five days to provide a prognosis for the development of insect pests and diseases," added Mr. Deaudelin.

By simultaneously processing weather forecasts and normal patterns of pest development, the software can recommend the best time for implementing control measures. This tool has obvious benefits since it allows producers to make pesticide applications under optimal conditions, thereby increasing treatment efficiency and averting repeat applications. Producers thus save both time and money, enhancing the profitability of their operations. With this strategic crop protection planning tool, pesticide use can be reduced, thereby benefiting the agricultural environment as a whole.

Besides optimizing treatment efficiency, the software predictions can help growers to determine the best timing for applications. Producers can thus maximize the interval between spraying and the next rainfall to diminish the risk of pesticides leaching from the soil and entering streams. The use of CIPRA therefore represents another step toward implementing sustainable

agriculture and preserving healthy ecosystems.

Conclusive results

During testing in summer 1997 at Agriculture and Agri-Food Canada's Horticultural Research and Development Centre (HRDC) in St. Jean sur Richelieu, the software helped to reduce pesticide spraying in carrot crops by roughly 60 per cent.

In light of these encouraging results, in 1998 the software was harnessed for use in carrot, onion, crucifer and apple growing operations. "Although meteorological conditions in Quebec last summer were not conducive to the use of forecasting models, spray applications were reduced by 10 to 30 per cent in carrot and onion crops at the HRDC's experimental farm in St. Clotilde. The results presage a substantial decrease in pesticide use as CIPRA becomes better known and is used more widely."

Quebec's crop protection warning network (Réseau d'avertissements phytosanitaires) is already using this tool to track crop pests and provide producers with more detailed and accurate advice in the form of crop pest warnings and information bulletins. Crop protection advisors with provincial extension clubs (Clubs d'encadrement) can also use CIPRA to enhance their ability to predict pest development and give advice on more selective and environmentally safe treatment options.

Projects galore

St. Lawrence Vision 2000 partners are constantly coming up with ideas for providing more effective support to the agricultural community. For example, thanks to financial assistance from the crop protection strategy support program under St. Lawrence Vision 2000, the CIPRA software will soon be enriched with even more powerful models, including an application for forecasting the development of late blight of potatoes.

Agricultural producers face many challenges in seeking to implement control measures that are both effective and environmentally sound. The new decision-support tools may help to lessen farmers' vulnerability to the whims of Mother Nature.

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Chronicle
 ZIP Committees in
 the Heat of the Action

Magdalen Islands ZIP Committee: New ZIP committee begins consultations

This series of articles features the efforts of Area of Prime Concern committees (referred to under the French acronym, ZIP, for Zone d'Intervention Prioritaire) to protect and restore the uses and resources of the St. Lawrence River. Between 1993 and 1998, ten ZIP committees were set up, covering different sections of the St. Lawrence River. Since the launch of Phase III of the St. Lawrence Action Plan, two new committees have come into being, one of them responsible for the Magdalen Islands, and two more are on the way. The first task of the new committees is to begin consultations as a basis for local Environmental Remedial Action Plans, or ERAPs.

Recognizing that people who live near the river have an important role to play in efforts to protect and conserve the St. Lawrence, the government partners in the St. Lawrence Vision 2000 Action Plan have created ZIP committees under the co-ordination of Stratégies Saint-Laurent, an environmental organization that has been working together with riverside residents since 1989.



Photo : Michel Papageorges

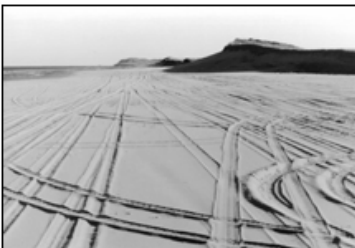


Photo : Lucie d'Amours

ZIP Committees are driven by the concerns of riverside communities. The creation of the Magdalen Islands committee was sponsored by the group Attention Fragîles. Founded in 1988, this environmental group already has a number of achievements to its credit. For example, it has succeeded in making elected officials and residents aware of the erosion damage caused by all-terrain vehicles in dunes and other fragile habitats, inventoried and protected threatened species, built interpretation trails and beach accesses, and restored and cleaned up habitats.

A new ZIP committee is born

The creation of the Magdalen Islands ZIP Committee is part of a series of activities to promote harmonization of environmental and socio-economic interests. For example, in 1996, a summit on the environment in the

Magdalen Islands organized by Attention Fragîles led to the drafting of a synthesis document stating the problems associated with the different uses of the environment and setting out priorities for action.

"One of our priorities was to increase knowledge of terrestrial and aquatic ecosystems and to set in motion a number of working committees, one of which would focus on the quality of the St. Lawrence and the protection of the marine ecosystem from the shoreline out to the offshore sector," explains ZIP Committee Chair Lucie d'Amours. "By creating this ZIP Committee, we will be able to continue working hand in hand with the community, in line with the philosophy of Attention Fragîles."



Photo : Michel Papageorges

The environment and its economic impact

While commercial fishing is still the main economic activity in the region, overexploitation of fishery resources, combined with environmental conditions unfavourable to many species, have brought about the collapse of groundfish stocks.



Photo : Michel Papageorges

According to many stakeholders, the fast-growing local tourism industry could offset some of the lost fishing revenue. However, certain projects may threaten natural habitats and biological resources. According to Ms. d'Amours, "The concerted action led by the ZIP Committee should strengthen the connection between the economy and the environment in the setting of priorities and standards for developing the fishing and tourism industries in years to come. Already, the Committee is helping to review shoreline zoning and uses in partnership with the MRC, the municipalities and Attention Fragiles."

The trouble with cranberry harvesting

Cranberries grow abundantly in the dunes of the Magdalen Islands. Because this littoral environment is so fragile, precautions need to be taken during harvesting in order to prevent resource and habitat damage.

As one of its first activities, and continuing the work of Attention Fragiles, the ZIP Committee has helped put together a cranberry management plan for the Magdalen Islands in co-operation with the UPA

and the MRC. If financial support can be obtained, areas where cranberries grow will be inventoried and pickers will be instructed in methods that cause the least possible damage.

Upcoming regional consultations

Although the Committee has only just begun to operate, it is already having a positive impact. "We can see how much credibility ZIP committees have elsewhere in the province with many levels of government and regional bodies, because they are able to put in place joint processes that get results," said Ms. d'Amours. "We also feel supported by Stratégies Saint-Laurent and the other ZIP committees, in addition to being able to rely on the expertise of our government partners."

Vehicles for disseminating knowledge of the St. Lawrence so far have included environmental assessments and technical reports on sources of pollution, biological resources, uses and potential for enhancement, and risks to human health associated with various uses of the St. Lawrence. These reports have been issued by various levels of government and cover different segments of the river.

Released on May 7, 1999, the environmental assessment of the Magdalen Islands includes the islands and the waters and sea floor within a 100-kilometer radius. The document will be used as a basis for discussion during public

consultations the ZIP Committee will hold on May 28 and 29 at the Hotel Château Madelinot, in Fatima. The purpose of the consultations will be to seek agreement on priorities and action to be taken under the ERAP for the sector.

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News *in* BRIEF

Next June 15, will take place in Sainte-Foy, a workshop on support for the implementation of action and ecological rehabilitation plans that must be carried out by the committees of Priority Intervention Zones (ZIP Committees)

located all along the St. Lawrence. Held within the framework of work by the Community Involvement component of the St. Lawrence Vision 2000 Action Plan, this workshop is intended for representatives of government agencies as well as those of Federal Departments and Quebec Departments. In the morning, these same people will be made aware by Stratégies Saint-Laurent, a non-governmental organization which coordinates the ZIP Committees, of the scientific and technical needs that are facing the communities living along the St. Lawrence when they are implementing their Action Plans. In the afternoon, work will be carried out in workshops with themes and reserved for governmental representatives only. The means and the nature of the support which can be lent to different agencies and departments will be specified.

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