

# Knowledge, attitudes and beliefs regarding crab asthma in four communities of Newfoundland and Labrador

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## ABSTRACT

**Objectives.** This study was conducted to learn from snow crab plants workers and others involved in the industry their knowledge and beliefs of health issues and potential solutions. **Study design.** This is a survey in four communities with different crab plant designs in Newfoundland and Labrador, Canada. **Methods.** At the start of a meeting to discuss crab asthma participants were requested to complete the questionnaire. **Results.** 65% of 196 participants believed there were health problems associated with crab plants. 85% have heard of crab asthma. Almost 80% identified correctly the major symptoms of crab asthma as difficulty breathing, chest tightness and cough. Only 74% of workers did not know that workers with crab asthma were eligible for workers' compensation. 55% of those surveyed had heard of crab asthma from crab plant workers and only 26% from their doctor or nurse. If they had breathing problems, 73% would see their local doctor, and 51% a specialist and 51% their nurse. **Conclusion.** The majority of participants believed that there were health problems associated with crab plants. The majority of crab plant workers could identify symptoms of crab asthma correctly. Many do not know that those with crab asthma can obtain workers' compensation. Most of them learn of crab asthma from other workers but would seek treatment from their doctor.

**Keywords:** crab plant, breathing, questionnaire

## INTRODUCTION

Shellfish landings in Newfoundland and Labrador, Canada, increased from 7% of total landings and less than 30% of landed value in 1980, to 60% of total landings and 75% of landed value in 1988. Snow crab is now the most commonly processed species and the highest revenue-producing species (\$1.6 billion in the past 4 years). The number of plants in the province licensed to process snow crab increased from 18 in 1994 to 40 in 2003. It is estimated that in 1998 over 7,000 workers were seasonally employed processing snow crab. The slow recovery of regional ground fish stocks (cod, flounder, turbot) has meant that opportunities for processing employment that do not involve exposure to shellfish are very limited.

One of the earliest researches on snow crab oc-

cupational asthma that described the condition was conducted in Newfoundland in 1978 (1). Since that time, the research related to this problem in the province has been limited and exploratory in nature. There is no published literature in English on the beliefs and knowledge of crab plant workers on crab asthma.

Interviews with processing workers, processors and rural health professionals indicate that in the past most cases of occupational asthma have not been appropriately diagnosed nor reported to the Workplace Health and Safety Compensation Commission (WHSCC) (2,3). Research done elsewhere, particularly in Quebec, has indicated that in environments where regulations limiting exposures were absent and awareness was low, prevalence of snow crab occupational asthma can

be 15% or higher in labour forces in plants that have been open for only a few years (4). Smoking increases the risk of developing snow crab occupational asthma while atopy is associated with an increased risk of sensitization to crab allergens. This research has also shown that occupational asthma is primarily caused by a process of sensitization to an allergen in the snow crab that becomes airborne during processing: snow crab processing is highly allergenic, as crab allergens are aerosolized in the air during cooking of crab (transported by steam and water droplets and vapours), butchering of crab and sawing of legs (5,6).

Snow crab asthma is mediated through an allergic mechanism involving the production of specific IgE antibodies to crab meat and cooking water (7).

The physical and mental health and socio-economic consequences of snow crab occupational asthma are potentially very serious. Greater severity of the disease and continued exposure after development of the disease increase the risk of long term health consequences that continue after cessation of exposure to the allergen (8,9). The existing research on the socio-economic impacts of shellfish OA is exploratory and the results are preliminary (2). Newfoundland research and research on other types of occupational asthma indicate that these impacts can be serious. Socio-economic impacts are likely to be particularly great among older workers, female workers and where an effective system for diagnosing and compensating those with the illness does not exist (10-16). Many workers with crab occupational asthma can continue to work using asthma medications. However, the asthma of some workers will worsen and become permanent (16-18).

**METHODS**

Following the initial discussion with plants managers and a provincial working group comprising managers, union representatives, government officials and WHSCC, four plants of different sizes and with different processing methods

were chosen for the study. Information sessions were held with plant management, workers and with local health professionals in each of the four communities. During these meetings the participants completed self-administered questionnaires on their beliefs and knowledge. These questionnaires were administered after the Working Group on shellfish, consisting of plant management, unions, and government officials, had developed a newsletter on shellfish OA and circulated this to participating labour forces, and after a protocol for the diagnosis of snow crab occupational asthma had been developed and circulated to physicians.

**RESULTS**

Of the 196 participants surveyed 71% were crab plant workers, 12% were in management, 10% were health professionals and 7% other interested community members (see Figure 1).

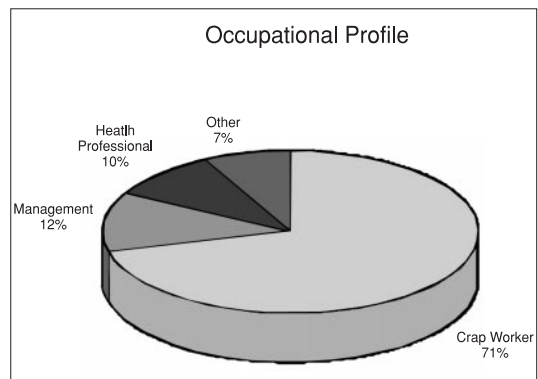


Figure 1. Occupation of Participants.

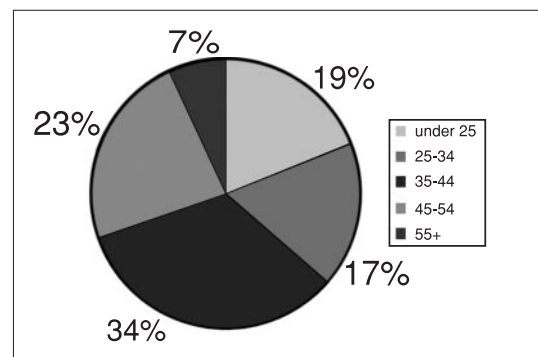


Figure 2. Age of Participants.

Sixty-one percent of the participants were female. There were more females than males amongst the workers, management and health professionals.

Nineteen percent of the participants were under 25 years of age, 17% between 25 and 34 years, 34% between 35 and 44 years, 23 % between 45 and 54 years and 7% 55 years and older (see figure 2).

73% of workers, 67% of management personnel and 94% of health professionals believe they are more likely to get sick processing crabs compared with cod. Back pain was the most common symptom identified by 53% of workers as related to working in crab plants. This was followed by cough (50%) and difficulty in breathing (40%). In contrast 83% of health professionals associated difficulty in breathing with crab plant workers, whereas only 28% associated back pain. Amongst management personnel the same proportion (43%) identified shortness of breath and back pain as associated with crab plant workers.

Health professionals were very concerned for crab plant workers. Ninety-four percent of health professionals believed that crab plant workers could die from crab asthma, whereas a lesser pro-

portion of management (61%) and crab plant workers (38%) believed crab plant workers could die from crab asthma.

Ninety-four percent of health professionals, 83% of management and 82% of workers correctly identified difficulty in breathing as a symptom of crab asthma. Seventy-four percent of workers did not know that workers with crab asthma are eligible for workmen's compensation. Only 25% of workers knew that asthma medication is not addictive.

Workers believe that wearing a mask (67%), turning on ventilation fans (65%) and enclosing the cooker (45%) are the three best ways of preventing crab asthma. Management and health professionals had similar beliefs regarding the three best ways of preventing crab asthma - 61%, 78% and 61% respectively for wearing a mask, turning on ventilation fans and enclosing the cooker.

Participants are more likely to hear about crab asthma from their co-workers (55%), and less from the company (30%), doctors or nurses (26%), union (24%), television (21%), family member (17%) or WHSCC (8%). Seventy-three percent would see their local doctor for breathing problems and 14% would just take their medicine and continue to work.

Most believed that plant owners are responsible for plant safety (71% of workers and 87% of management and health professionals). Forty three percent of management, 41% of plant workers and 11% of health workers felt that regional health boards are responsible for plant safety. Most of the health professionals (66%) felt that the provincial government are responsible, but only 34% of management and 9% of plants workers felt that the provincial government are responsible for plant safety. (See Figure 3)

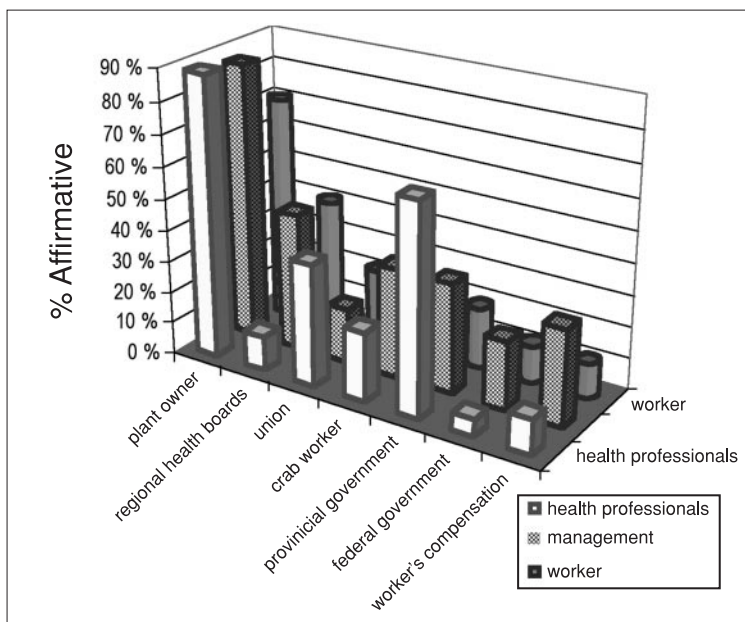


Figure 3. Beliefs regarding responsibility for crab plant safety.

## DISCUSSION

At the start of a three-year research project on crab asthma, we went first to the communities to learn from them what they knew and what their beliefs were regarding occupational illnesses relating to the crab industry.

Most of the workers (73%), management (67%) and almost all of the health professionals (94%) believed that workers are more likely to get sick working with crabs than with cod. This gave credence to the research team who had preliminary evidence that occupational crab allergy and asthma is a major problem for crab plant workers in the province. Even though there have been no deaths, almost all of the health professionals (94%) working in the four communities felt that crab plant workers could die from crab asthma. Most of the management staff (61%) believed that a worker can die from crab asthma, but only 34% of crab workers had the same belief. This may be because almost all health professionals had seen patients with severe crab asthma. Some but not all crab plant workers might have had personal experience of crab asthma or witnessed others workers with the illness, and this could explain the lower proportion of workers who felt a person could die from the illness. As a group, management were more likely than workers to have had involvement with workers afflicted with crab asthma.

More crab plant workers identified back pain (53% of workers) rather than cough (50% of workers) and difficulty in breathing (40% of workers) as problems associated with working in crab plants. Equal proportion (43%) of management personnel felt that back pain and shortness of breath were associated with crab plant workers. However, more health professionals believed difficulty in breathing was associated with crab plant workers than back pain (83% versus 28% respectively). The differences probably reflect the different experiences of the groups. Health professionals were more likely to see patients with difficulty in breathing, workers as a group had less exposure to colleagues with breathing difficulty at work, and

management personnel had about equal experience with workers with back pain and shortness of breath.

Health professionals, management personnel and crab plant workers were for the most part knowledgeable about the symptoms of crab asthma. Almost all of health professionals (94%), and most of management personnel (83%) and workers (82%) correctly identified difficulty in breathing as a symptom of crab asthma. The reason why not all health professionals knew was possibly because social workers with no medical training were part of the health team in two of the four communities surveyed. There were knowledge gaps amongst worker. Only 25% of workers knew that asthma medication was not addictive. The majority of workers (74%) were not aware that workers with crab asthma were eligible for workmen's compensation. This was despite the unionization of all workers and newsletter on crab asthma being distributed by the Working Group to workers one year ago.

As expected, most of the participants (55%) learned about crab asthma from their colleagues. It is not surprising that only 26% of the participants heard of crab asthma or crab lung from their nurses or doctors, since most of the participants would not have seen their health professional for this condition. It is worthwhile to note that only 24 % of the participants heard of crab asthma or crab lung from their union. Eighty-three percent of the participants (workers and management) in our study group had been involved in a mail-out survey and feedback newsletter on crab asthma. This would indicate that mail-outs and newsletters were not effective communication tools for this population. This should help the research team in avoiding doing the same when disseminating the research results.

Wearing a mask, ventilation fans and enclosing the cooker were the three most popular recommendations for preventing crab asthma among all three groups (workers, management and health professionals). This provided the re-

search team potential research questions to consider. Sixty-three percent of workers believed that wearing a mask would help prevent crab asthma. This is somewhat surprising, considering this may be a constraint to working in a relatively humid environment.

Plant management was singled out by the majority workers, management and health professionals as responsible for plant safety. It is worthwhile to note that workers and management felt regional health boards were second to plant owners as being responsible for plant safety. In reality, it is the Department of Labour within the provincial (state) government that has the mandate for work safety. The Department of Fisheries in the federal government has the ability to discontinue issuing a licence for harvesting crab and therefore the means to obtain compliance for work safety. WHSCC is a provincial organization that assesses and pays compensation for work-related injuries and has vested interests in improving workers' health. Unions represent the workers and are interested in workers' well being. The multiplicity of roles and responsibility for safety in the workplace poses challenges in working out solutions for improving health in the workplace.

It is reassuring that most participants (73%) indicated that they would see their local doctor if they had a breathing problem. Nonetheless, 14% would just take their medicine and continue to work. In an ideal world, all workers with occupational asthma are offered a work environment without the offending agent that causes the illness. Workers with crab asthma that continue to be exposed to crab allergens can develop chronic asthma despite subsequent discontinuation of exposure (8,9).

## CONCLUSION

The majority of participants believed that health problems were more likely to occur processing crab than cod. The majority of crab plant workers could identify symptoms of crab asthma correctly. There were knowledge gaps. Many do not know that those with crab asthma can obtain

workers' compensation, and many suspect that asthma medication is addictive. Most learned about crab asthma from their work mates but would seek treatment from their doctor. Participants offered opinions regarding ways for prevention. This exercise offered the research team confirmation of the concern for crab asthma, ideas for research question and a better understanding of the beliefs and knowledge in the communities with crab plants.

## Acknowledgement

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