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Evaluation of Health Effects from Exposure to Oxygenated Fuel in Fairbanks, Alaska

During December 6-9, 1992 the Section of Epidemiology conducted a rapid, initial assessment of reports of widespread illness in Fairbanks attributed to exposure to oxyfuel or motor vehicle exhaust. In order to evaluate the possible relationship between illness and exposure to oxyfuel, interviews were conducted with a sample of Fairbanks residents. This bulletin provides updated information.

Methods: Two groups of people who travel routinely by motor vehicle were interviewed: taxi drivers and health-care workers. University students living on-campus were selected as a control group. Taxi drivers were interviewed at Fairbanks International Airport; health-care workers at Tanana Valley Clinic, Fairbanks Memorial Hospital, and the State Public Health Laboratory-Fairbanks; and students at the University of Alaska Fairbanks dining commons.

A case of possible oxyfuel-related illness was defined as a person who reported that on or after October 15, 1992 (the date oxyfuel was introduced in Fairbanks) they experienced:

1. An increase in headaches; or
2. An increase in at least two of the following:
 - nausea or vomiting
 - burning sensation in the nose or mouth
 - cough
 - dizziness
 - spaciness or disorientation
 - eye irritation

Any person reporting an increase of one (or more) symptoms of acute viral syndrome (diarrhea or loose stools; fever; sweats or chills; and muscle aches) was considered to possibly have an acute infection and therefore was not counted as a case.

Results: The response rate was extremely high; less than 5% of persons refused to participate. The proportion of persons meeting the case definition was greater among the taxi drivers and health-care workers than the students (chi-square = 8.26; $p=0.016$) (Table 1).

Table 1. Persons interviewed and number of cases.

	No. interviewed	No. of cases (%)
Taxi drivers	16	6 (.38)
Health-care workers	88	25 (.28)
University students	101	14 (.14)

Table 2. Symptoms of cases of possible oxyfuel-related illness.

	Taxi drivers (n=6)	Health-care workers (n=25)	University students (n=14)
Headache	5	20	9
Cough	3	9	6
Nose or throat burning	2	8	3
Eye irritation	3	7	3
Nausea or vomiting	0	2	3
Spaciness	3	1	2

Headache, the most common complaint, was generally of relatively short duration (<1 hour or 1-24 hours) (table=2).=>

On average, students, health-care workers, and taxi drivers reported spending 0.8, 7.0, and 67.5 hours per week, respectively, traveling by motor vehicle. We also examined the proportion of people meeting the case definition who reported having symptoms while traveling in a motor vehicle or adding fuel to a motor vehicle (Table 3). University students, who spent little time traveling in or adding fuel to motor vehicles, had a smaller proportion of their symptoms while engaged in these activities.

Table 3. Number of cases who reported symptoms while traveling in or adding fuel to a motor vehicle.

	Symptoms while traveling	Symptoms while fueling
Taxi drivers (n=6)	4	3
Health-care workers (n=25)	11	9
University students (n=14)	3	3

Discussion: Symptoms were acute, mild, and of relatively short duration. No persons were known to have had severe symptoms. Most persons interviewed were sincere, concerned, and appeared to be providing honest information. Our findings of a significant difference between symptoms reported by health-care workers and taxi drivers compared to students must be considered preliminary--substantial additional investigation will be needed before concluding that symptoms are being caused by exposure to oxygenated fuel or motor vehicle exhaust.

Because no illness can be anticipated to occur from exposure to carbon monoxide in ambient air in Anchorage or Fairbanks at the levels and frequency that have occurred in the past or could be expected to occur in the future, the health benefits of the oxyfuel program must be seriously questioned. The balance between expected benefits if the oxyfuel program is resumed and the possibility that illness is caused by the program needs careful consideration.

Our findings and conclusions were similar to those of the team of medical epidemiologists from the National Center for Environmental Health, CDC. Additional studies are underway to further evaluate the potential health effects of oxyfuels. On December 11, the oxyfuel program in Fairbanks was suspended.

We continued our investigation and analysis after completing an initial report (dated 12/11/92). We found several minor errors in the initial report, and the numbers in this report differ slightly from those in the 12/11/92 report. The overall findings and conclusions were not affected.

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