

## Appendix B: Health Survey Results

To look at the health impacts of open dumps on Alaska native people, CCTHITA carried out studies in four villages located in the Yukon Delta, Northwest, Yukon Interior, and Southeast. In each village, a local interpreter accompanied a health expert (an "epidemiologist"), and they went from house to house, talking with people. More than 95% of the households were reached. The total number of households interviewed was 295, representing 1,221 people.

### What Solid Waste Disposal Factors Increase Our Health Risks?





Before going to the villages, the health expert researched several studies on people living near different solid waste sites around the world. Based on people's testimonies, she found they had increased chances for a weakened immune system, greater stress and fear about where they were living, and a higher chance at being affected by hazardous chemicals in the dumps.

In our study, there were four factors found that made a difference in how healthy people were:


- ✓ Visiting the dump
- ✓ Home barrel burning
- ✓ Household distance to the dump
- ✓ Bothered by smoke or odors from the dump

Remember, this doesn't mean that other waste disposal factors are not risky. It only means that we couldn't find anything with this study. For example, there was only one dump burned during the time we were interviewing. A lot more people may have said they had coughing, eye irritation and other symptoms if smoke were hanging in the air then.


Look at Table B-1 below. It lists different health symptoms in the first column, and the percent of people affected with those symptoms in the second column. The next four columns list the relative risks that people have if they meet that particular factor.

**What is a relative risk?**



A characteristic that a group of people shares, like smoking cigarettes, is looked at. Another group of people-- the "control group" - doesn't have that characteristic (i.e. they are not smokers). Both groups are asked questions about their health, like whether they cough. In our example, the relative risk for the group of smokers is how much more the smokers coughed than the non-smokers (e.g. if the relative risk is 3, smokers coughed three times more often than non-smokers). To be useful, the results have to be adjusted for other factors that might affect why people cough. So for example, the study would not include people who had a cold or fever.


















Table B-1  
Relative risk of symptoms related to waste disposal factors<sup>a</sup>.

Symptom	% Affected	Live near dump	Dump smoke or odor concerns	Burns near home	Visits dump
Rash	7.2	----	2.3	29.7	2.9
Faintness	3.6	4	6.3	see Table B-3	3.5
Fever	8.7	----	1.7	2.3	2.0
Stomach pain	10.3	----	2.2	----	3.0
Vomiting	2.6	----	1.6	----	3.6
Diarrhea	5.2	----	1.5	----	----
Ear irritation	4.4	----	5.5	----	2.1
Eye irritation	5.9	18.9	2.3	----	3.7
Congestion	19.4	----	1.8	----	1.4
Sore throat	14.1	----	1.8	2.0	1.6
Cough	18.4	----	1.5	1.9	1.7
Headache	14.1	2.9	2.0	----	3.0
Numbness	3.5	----	2.6	see Table B-3	3.4

<sup>a</sup> Adjusted for age, smoke/tobacco, race, sex, and socio-economic status (where necessary).

**How to read Table B-1** Lets look at the first row - which is the risk of getting a rash. Out of all the households interviewed, 7.2 percent of people had rashes in the last 10 days. That's a lot! In the third column, the "----" means that people living near the dump don't have any higher risk to get a rash than people not living near the dump. Look at the next column in the first row: It says that people who were concerned about the smoke and/or odors coming from the dump were on average 2.3 times more likely to get a rash than people who weren't concerned. The next column shows **that people who burned their garbage near their home were 29.7 times more likely to get a rash than people who didn't home burn!** Anyway, the next number says that people who visit the dump are 2.9 times more likely to get a rash than people who don't visit the dump.

**Scientific details**

If you will be using this information for funding or to share with scientists, you should know that to get what is considered a significant result by scientists, all the people were looked at together, and not as a separate village. And people were asked about the health symptoms they had in the previous 10 days only. That way, a person's memory isn't a problem. Also, the results were adjusted for things like age, smoking, tobacco use, race, and sex, and economic status, where necessary.

**More Science Details --Confidence Intervals** Scientists like lots of numbers. If you give them the numbers in Table B-1, they'll ask you how confident you are about the results. You can give them the numbers listed in Table B-2, below. For each factor, this Table tells you the range of what the relative risk *could* be. For example, for burning garbage near your home, you can say there is a 95% chance that people are at least 3.1 times more likely to get a rash, and they may be up to 283.1 times more likely to get a rash. The range of 3.1 → 283.1 is called the "95% confidence interval" for the relative risk of getting a rash if you home burn.

Table B-2  
Range of relative risks of symptoms related to waste disposal factors (95% confidence intervals)<sup>a</sup>.

Symptom	% Affected	Live near dump	Dump smoke/odor concerns	Burns near home	Visits dump
Rash	7.2	-----	1.2 → 4.3	3.1 → 283.1	1.8 → 4.6
Faintness	3.6	1.2 → 3.3	3.3 → 11.8	see Table B-3	1.3 → 9.4
Fever	8.7	-----	1.1 → 2.6	1.5 → 3.7	1.1 → 3.4
Stomach pain	10.3	-----	1.3 → 3.8	-----	2.0 → 4.5
Vomiting	2.6	-----	1.1 → 3.3	-----	1.7 → 7.5
Diarrhea	5.2	-----	1.0 → 2.4	-----	-----
Ear irritation	4.4	-----	2.7 → 11.2	-----	1.3 → 3.4
Eye irritation	5.9	4.3 → 82.4	1.0 → 5.2	-----	2.1 → 6.7
Congestion	19.4	-----	1.2 → 2.7	-----	1.0 → 1.8
Sore throat	14.1	-----	1.2 → 2.7	1.2 → 3.0	1.2 → 2.7
Cough	18.4	-----	1.0 → 2.0	1.2 → 2.9	1.3 → 2.2
Headache	14.1	1.2 → 7.0	1.3 → 3.1	-----	2.2 → 4.1
Numbness	3.5	-----	1.1 → 5.8	see Table B-3	1.9 → 6.2

Risk of Living Near the Dump

One thing you should know is that for the "distance to dump" factor, people who lived closer than 1,000 ft to the dump were compared with people who lived 5,000 ft or more. But 5,000 ft is still pretty close. Other studies have shown effects on people as far away as 5 or 10 miles. It's just that, like in most native villages, the households in the villages studied were all pretty near the dumps. So it is possible that one reason why distance to the dump didn't show increased risks for more health symptoms might be that all the homes are too close to the dump. Remember too, as described in Chapter 3, distance to the dump also affects whether people were bothered by dump smoke or odors.

**More on Home Barrel Burning**

How often people burned near their home affects what the relative risk is for having symptoms of faintness or numbness. Table B-3 lists the relative risk for home barrel burners depending on how often they burn. The low and high ends of the "95 % confidence interval" are included in the set of parentheses.

Table B-3

Increasing risk of faintness and numbness with more frequent household barrel burning (numbers in parentheses give 95% confidence interval).

Symptom	Burns once every couple of weeks	Burns weekly	Burns frequently (more than 1x per week)
Faintness	5.4 (1.0, 28.7)	13.2 (4.2, 40.9)	17.4 (6.4, 47.1)
Numbness	4.8 (1.6, 13.9)	5.2 (1.8, 15.0)	10.1 (4.9, 20.7)

Remember with home barrel burning, people in neighboring households likely have increased risk too. People who don't separate out their plastics or hazardous wastes, and burn garbage to start or maintain fires inside home stoves or steam baths probably have the highest risk because they get the greatest exposure!

## Honeybucket Disposal and Subsistence

The CCTHITA study also had some interesting results having to do with honeybucket use and subsistence practices. To summarize, they are that:

- ✓ Using honeybuckets increases your risk for diarrhea (and complications that can result)
- ✓ Eating more subsistence foods decreases that risk
- ✓ Subsistence activities are substantially changed or reduced due to people's concern about their dump

Experiencing diarrhea is the only health symptom looked at for which honeybuckets increases your risk. People who used honeybuckets were on average 6.4 times more likely to have had diarrhea in the past 10 days (the 95 percent confidence interval is between 2.8 and 15.0). In honeybucket villages, **people who ate subsistence foods more than half the time were 15.1 times less likely to get diarrhea than other people.** The 95 percent confidence interval for this risk is 3.0 to 76.3.

**Eating a subsistence diet decreased people's risks for a number of other symptoms of poor health.** The relative amount by which subsistence foods reduced health risks is given in Table B-4. The numbers given compare people who eat subsistence foods more than one-half the time to people who ate subsistence foods less than one-half the time.

See also Tables 3-1a and 3-1b in Chapter 3 of this manual for numbers on the impact of open dumps on subsistence activities.

Table B-4

Relative risk of residents eating a subsistence diet less than half of the time compared with residents eating subsistence foods more than half of the time for various health symptoms in four Alaska villages<sup>a</sup>.

Symptom	Subsistence
rash	--
faintness	--
fever	2.3 (1.5, 3.7)
stomache pain	1.5 (1.0, 2.4)
vomiting	3.4 (1.3, 8.8)
diarrhea	Effect modified by honeybucket use (see text)
ear irritation	--
eye irritation	--
congestion	--
sore throat	--
cough	1.6 (1.1, 2.4)
headache	--
numbness	--

<sup>a</sup> Adjusted for age, smoke/tobacco, race, sex, and socio-economic status (where necessary).

In case someone asks you whether the CCTHITA health study "corrected" for certain conditions, Table B-7 lists some diseases and health-related symptoms looked at. The numbers given in this Appendix were also corrected for age, race, sex, and income level when necessary.

Table B-7  
Prevalence of various health factors in four Alaska Villages

Condition	Prevalence (percent)
Cigarette Smoking	8.4
Passive Smoking	10.8
Chewing Tobacco	3.8
Diabetes	0.3
Asthma	1.5
Allergies	1.5

