

**Cancer Incidence Rates in Northeastern Minnesota
with an Emphasis on Mesothelioma**

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Cancer Incidence Rates in Northeastern Minnesota with an Emphasis on Mesothelioma: 1988-1999

Background

The Minnesota Department of Health first documented the rates of mesothelioma and other cancers in Northeastern Minnesota in a 1997 report, Cancer Rates and Trends in Northeastern Minnesota, 1997. This analysis, using data from 1988-1994, showed that overall cancer rates in Northeastern Minnesota were virtually identical to statewide rates. For several specific types of cancer, some differences were observed, typical of almost all such geographic comparisons of cancer rates. However, a large and significant elevation was found for mesothelioma – a rare cancer that typically occurs several decades after exposure to asbestos. These findings were confirmed in a 1999 analysis that included two additional years of cancer data (see Cancer Incidence Rates in Northeastern Minnesota, 1999). Between 1988 and 1996, 54 cases of mesothelioma were diagnosed among men in northeastern Minnesota. This was 73% higher than the expected number of cases (31) based on the statewide average and the population of the region. Mesothelioma rates were not elevated among women (3 cases, 8 expected).

Data:

Cancer incidence data for Minnesota residents in this report come from the Minnesota Cancer Surveillance System (MCSS). For information about the sources of the data, see The Occurrence of Cancer in Minnesota 1988-1996: Incidence, Mortality, Trends, 1999.

This MCSS report provides another update on mesothelioma and other cancer rates in Northeastern Minnesota incorporating three additional years of cancer data. Table 1 contains the number of newly occurring cancers compared to the number expected based on statewide cancer rates for the 12-year period 1988 through 1999. This analysis again finds that overall cancer rates in NE Minnesota are comparable to the statewide averages,

with the expected variability for specific types of cancer. For both sexes combined, 20,755 new cases of cancer were found among NE Minnesota residents, a rate identical to the statewide average. Again, this analysis finds a large and significant elevation in the rate of mesotheliomas among men, but not among women. During the 12-year period, 81 men were diagnosed with mesothelioma while 45 cases would have been typical, representing an 81% excess. Among women, 10 new cases of mesothelioma were diagnosed, while 11 would have been expected. Figure 1 shows mesotheliomas rates for all Minnesota counties in which cases were diagnosed. Carlton County in Northeastern Minnesota continues to have the highest rate of mesothelioma in the state.

Discussion:

Apparent excesses and deficits of specific cancers over specific time periods, geographic regions, age groups, or other groupings are quite common and easily identified. These differences, although sometimes very alarming to the public, very rarely represent situations requiring further investigation [Bender, 1990 ; Williams, 1998]. The finding of almost a two-fold elevation of mesothelioma among men in this report and previous reports represents a very different scenario than the usual (and expected) statistical variability in cancer rates in small populations.

Several factors point to a true increased risk of mesothelioma in this population with a likely causal agent. First, mesothelioma is a very rare cancer. Second, there is only one known cause: exposure to asbestos. Most (but not all) people with mesothelioma have an identifiable history of exposure to asbestos that occurred several decades prior to diagnosis. Third, the excess is only evident in men, strongly suggesting workplace exposures. Men are much more likely historically to be employed in industries and occupations with potential asbestos exposure. Many types of industries and occupations have been shown to have elevated rates of mesothelioma or other specific cancers. Fourth, the excess is persistent and possibly increasing as additional years of cancer data have been analyzed. Fifth, large numbers of people in NE Minnesota were employed during the 1950s through the 1970s in industries and occupations in which exposure to commercial asbestos was likely or possible.

The Minnesota Department of Health has documented asbestos-related lung abnormalities among a large cohort of workers at the former Conwed Corporation plant in Carlton County. This facility used large quantities of commercial asbestos in the manufacturing of mineral board and ceiling tile (MDH, 1989). Mesothelioma occurrence and possible asbestos exposure related to the mining and other industries will be addressed in a future Minnesota Department of Health report.

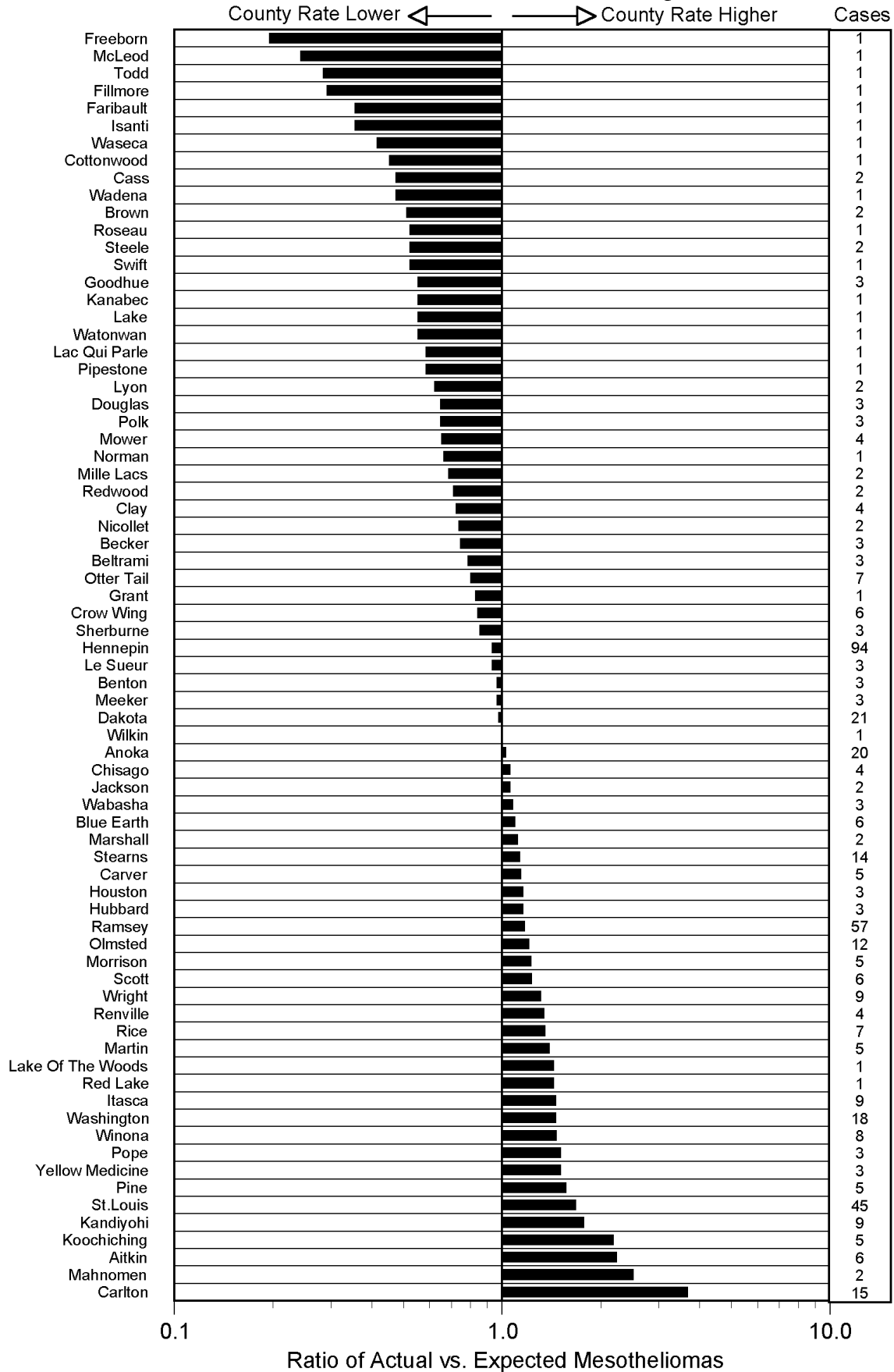
Table 1. Actual and Expected¹ New Cancers Diagnosed Among Residents in Northeastern² Minnesota, 1988-1999.

<i>Cancer</i>	<i>Males</i>			<i>Females</i>		
	Actual Cases	Expected Cases	Ratio of Actual to Expected	Actual Cases	Expected Cases	Ratio of Actual to Expected
Oral Cavity	358	358	1.00	171	168	1.02
Esophagus	174	139	1.25	64	45	1.42
Stomach	234	210	1.12	136	113	1.21
Colon	954	932	1.02	968	992	0.98
Rectum	411	389	1.06	267	277	0.96
Liver	67	79	0.85	40	41	0.98
Pancreas	183	196	0.93	207	173	1.20
Larynx	176	148	1.19	39	31	1.26
Lung And Bronchus	1,619	1,543	1.05	1,131	1,002	1.13
Mesothelioma	81	45	1.81	10	11	0.90
Soft Tissues	68	71	0.96	63	55	1.14
Melanomas of Skin	277	313	0.89	259	257	1.01
Breast	18	19	0.95	3,133	3,075	1.02
Cervix Uteri	-	-	-	178	168	1.06
Corpus Uteri	-	-	-	701	616	1.14
Ovary	-	-	-	426	394	1.08
Prostate	3,259	3,725	0.87	-	-	-
Testis	103	107	0.96	-	-	-
Urinary Bladder	757	739	1.02	261	253	1.03
Kidney And Renal Pelvis	282	320	0.88	155	185	0.84
Brain	143	151	0.95	108	113	0.96
Thyroid Gland	76	64	1.19	123	154	0.80
Hodgkin's Disease	57	66	0.86	43	54	0.80
Non-Hodgkin's Lymphomas	495	472	1.05	430	414	1.04
Multiple Myelomas	130	131	0.99	92	105	0.88
Leukemias	326	349	0.93	264	251	1.05
All Cancers	10,850	11,120	0.98	9,905	9,553	1.04

¹The "expected" number of cancers represents the number of cancers that would have occurred in the region assuming its rates were identical to the statewide average.

²Defined as the following seven counties: Aitkin, Carlton, Cook, Itasca, Koochiching, Lake, and St. Louis

Figure 1. Male Mesothelioma Rates by County Compared to Statewide Average, 1988-99.
 (Rates not shown for 14 counties with 0 cases and a total of 22 expected cases).



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