

**INFLAMMATORY BOWEL DISEASE AND
CHRONIC RENAL DISEASE:
TRAIL LOCAL HEALTH AREA,
WITH REGIONAL COMPARISONS**

**A Comparative Review of
Selected Health Indicators ,
Prepared for the Medical Health Officer,
Central Kootenay Health Unit**

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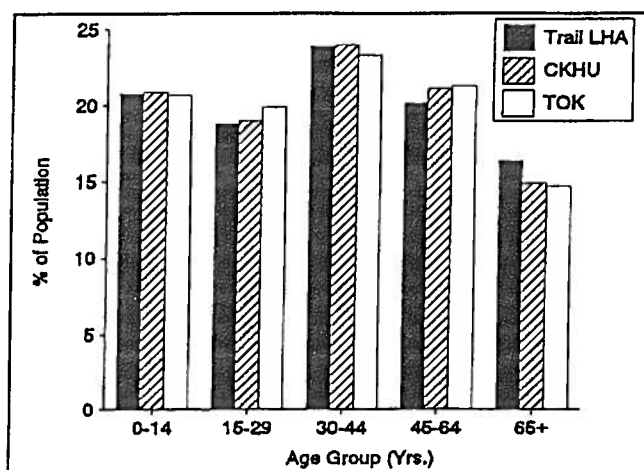
September 14, 1994

INTRODUCTION

The Trail Local Health Area is located near the international boundary in the Central Kootenay Health Unit (CKHU).* Concerns about health problems attributed to environmental pollution have been expressed in Northport, Washington, a community located across the border to the south of Trail. While the Medical Health Officer for CKHU has not received any similar complaints from Trail residents or local physicians, he requested a review of available information on selected diagnostic disease categories for the residents of the Trail Local Health Area, together with comparable data from CKHU and other Local Health Areas (LHAs) in the Thompson-Okanagan-Kootenay (TOK) Region. Therefore, the purpose of this review is descriptive, and intended to complement a similar study by Washington State health authorities.

The population of Trail LHA is approximately 20,800, while the community with the largest population in the Trail LHA is Trail itself, at 8,100. The other communities, with their approximate 1993 populations, are as follows: Rossland (3,700), Fruitvale (2,100), Warfield (1,800), and Montrose (1,200). The TOK Region occupies the southeast corner of British Columbia, and is comprised of five Health Units (HUs), which are further subdivided into 29 LHAs, as listed in Appendix B. The populations within this group of LHAs vary from approximately 3,300 to 121,900. There are 7 LHAs with larger populations, and 21 LHAs with smaller populations than Trail LHA. The total population of the TOK Region is about 557,000, while the population of B.C. is approximately 3,451,000. Over the period 1988 to 1992, the population of the TOK Region increased by 10.5%, while the population growth for Trail LHA was proportionately less at 2.1%. The age structure of the population of Trail LHA is very similar to that in the CKHU and the entire TOK Region, with a slightly higher proportion of elderly in Trail LHA. (See Figure 1.)

Figure 1: Comparative Population Age Structure
Trail LHA, CKHU, & TOK Region, 1993



Original Data Source: Central Statistics Branch,
B.C. Ministry of Government Services
Data Acquired Through: Health Planning Database,
B.C. Ministry of Health

* Maps of CKHU and other Health Units in British Columbia can be found in Appendix A.

METHODOLOGY

Unless otherwise indicated, all data used in this report were obtained from provincial hospital morbidity and mortality databases maintained by the B.C. Ministry of Health. The analysis was based on the LHA, which is the smallest geographic unit from which data can be compiled and aggregated. The important feature of these provincial databases is their ability to classify hospital cases and deaths by LHA of residence of the individual, regardless of whether the event occurred in the LHA of residence or some other LHA.

As stated previously, many LHAs, including the Trail LHA, have relatively small populations, which make it difficult to interpret trends or differences over relatively short periods of time, due to significant annual variations in the number of cases. In order to reduce the impact of this "small numbers" effect and strengthen the analysis, the following approach was taken:

- Exclude gender from the analysis, using only data for males and females combined,
- Utilize age standardized rates for geographic and time comparisons,
- Include comparisons of 5-year cumulative average rates as well as annual rates, and
- Display the range of highest to lowest rates amongst LHAs in the TOK Region.

The following factors were taken into consideration in selecting disease groupings* for analysis:

- Concerns expressed about possible health problems such as inflammatory bowel disease, associated with environmental pollution, in some Washington counties near the border.
- Known or theoretical effects of certain heavy metals, such as the toxic effect of excessive cadmium on the kidney.
- Inclusion of several diagnoses which could be made by physicians in treating conditions which may have somewhat similar symptoms and/or signs.

Accordingly, the following diagnostic groupings were used, as shown in Table A below:

Table A: Diagnostic Groups by ICD9 Chapter and Disease Codes

ICD9 Chapter	Hospital Morbidity	Mortality
IX: Diseases of Digestive System	555 - Regional enteritis	Same, excluding 564.1
	556 - Idiopathic proctocolitis	
	558 - Other noninfective gastroenteritis and colitis	
	564.1 - Irritable colon	
X: Diseases of Genitourinary System	581 - Nephrotic syndrome	
	582 - Chronic glomerulonephritis	
	583 - Nephritis & nephropathy	
	585 - Chronic renal failure	
	586 - Renal failure, unspecified	

- * The inclusion of any particular disease in this list does NOT imply that the disease necessarily has an environmental cause nor is associated in any way with environmental factors. Note that cancer diagnoses, having been the subject of an earlier study by the B.C. Cancer Agency, were excluded from this report.

INFLAMMATORY BOWEL DISEASE

For the purposes of this report, the term Inflammatory Bowel Disease (IBD) will refer to ICD9 Codes 555, 556, 558, and 564.1 for morbidity data and Codes 555, 556, and 558 for mortality data. The data for Trail LHA and CKHU are shown in Table B below, indicating considerable annual variation in hospital cases, as expected with "small numbers." Note that these hospital cases represent episodes of hospital care, not necessarily the number of individual patients, eg. 10 cases could be 10 individuals admitted once, or 1 individual admitted 10 times. (The data for other LHAs are found in Appendix C.)

Table B: Inflammatory Bowel Disease, Hospital Cases and Deaths, Sexes Combined, Trail LHA and CKHU

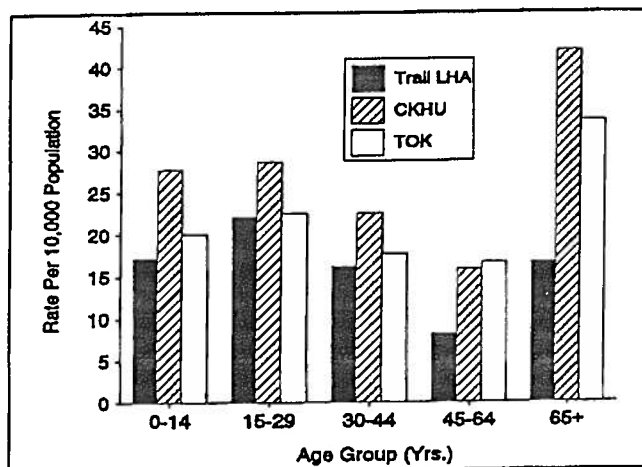
Year	Hospital Cases		Year	Deaths	
	Trail LHA	CKHU		Trail LHA	CKHU
1988/89	63	216	1988	0	0
1989/90	35	159	1989	0	1
1990/91	19	173	1990	0	0
1991/92	15	206	1991	0	0
1992/93	33	202	1992	0	0
Data Source: Information Systems, Inpatient Programs Program Standards and Information Management, Regional Programs			Data Source: Division of Vital Statistics B.C. Ministry of Health		

The gender ratio of the IBD hospital cases was also examined for this period, and was found to be similar, as follows:

- Trail LHA (M/F = 0.77:1)
- CKHU (M/F = 0.62:1)

Figure 2: Hospitalizations for Inflammatory Bowel Disease, Age Specific Rates Per 10,000 Population, Sexes Combined, 5 Year Cumulative Averages, 1988/89 to 1992/93

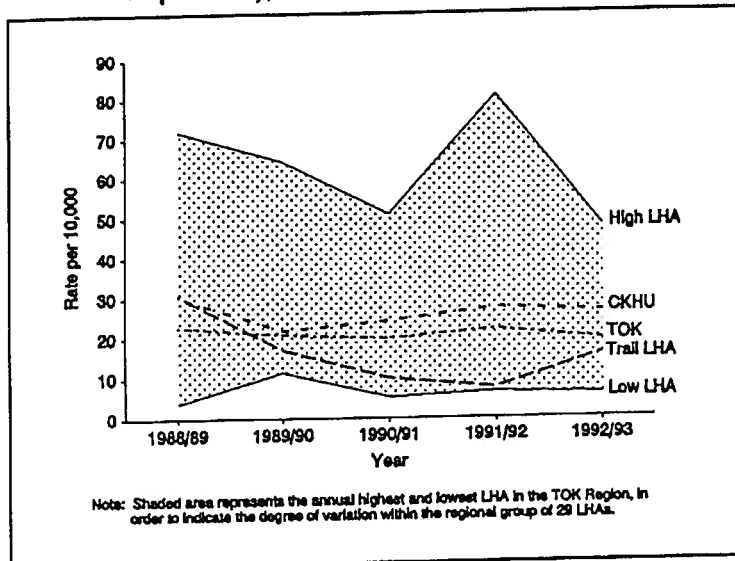
Because of the relatively few cases in each age group per year, the age distribution of the hospital cases was calculated cumulatively for the last 5 year period, as shown in Figure 2. For IBD, Trail LHA had hospitalization rates comparable to or slightly lower than the other areas, particularly in the older age groups. As there were no deaths due to these causes in Trail LHA, and also few to none in the other LHAs in TOK, no further analysis was done on mortality statistics for IBD.



Data Source: Information Systems, Inpatient Programs,
Program Standards and Information Management,
Regional Programs

Figure 3: Inflammatory Bowel Disease, Age Standardized Annual Hospitalization Rates (Cases Per 10,000 Population), 1988/89 to 1992/93

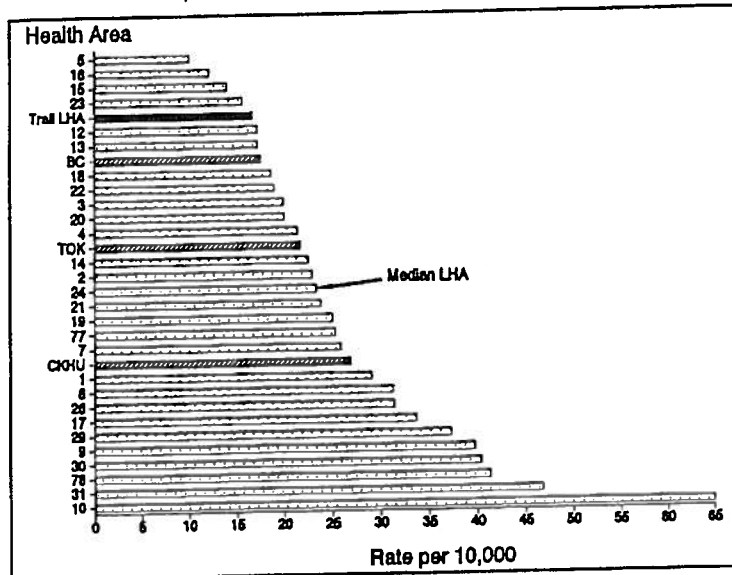
Over the last five years, the Age Standardized Hospitalization Rates for IBD in Trail LHA have fluctuated at or below the rates for CKHU and TOK Region, approximately within the lower third of the range of variation in rates between the Highest and Lowest LHAs in the TOK Region (See Figure 3).



Data Source: Information Systems, Inpatient Programs, Program Standards and Information Management, Regional Programs

Figure 4: Inflammatory Bowel Disease, Age Standardized Hospitalization Rates (Cases Per 10,000 Population), 5 Year Cumulative Averages, 1988/89 to 1992/93

In order to reduce the effect of annual rate variation, Five Year Cumulative Average Age Standardized Rates were also calculated (See Figure 4). On this comparison, Trail LHA occupied a position below the CKHU and TOK Region, and was also lower than the rate of the Median LHA in the TOK Region. The CKHU and TOK Region rates both exceeded the provincial average, while the Trail LHA rate was slightly lower than the provincial average.



Data Source: Information Systems, Inpatient Programs, Program Standards and Information Management, Regional Programs

In order to assess the significance of the IBD hospitalization rate differences between Trail LHA and CKHU/TOK Region, 95% confidence limits and p-values (two-sided) were calculated, with the following results (see Table C):

Table C: 95% Confidence Limits and Statistical Significance Tests, Inflammatory Bowel Disease, Age Standardized Hospitalization Rates (Cases Per 10,000 Population), 5 Year Cumulative Averages, 1988/89 to 1992/93

Area	IBD Cases per 10,000	95% Confidence Limits	p-Value*
Trail LHA	16.2	13.8 - 18.7	--
CKHU	26.0	24.4 - 27.7	< 0.0001
TOK Region	21.0	20.5 - 21.6	0.0002
* p-value for difference between Trail and each larger area.			
Source: Research and Evaluation Branch, Policy, Planning and Economics			

This review of hospital case rates indicates that the hospitalization rate for Inflammatory Bowel Disease in Trail LHA residents is significantly lower than that of the residents of CKHU and TOK Region.

CHRONIC RENAL DISEASE

For the purpose of this report, the term Chronic Renal Disease (CRD) will refer to ICD9 Codes 581, 582, 583, 585, and 586 for both morbidity and mortality data. The data for Trail LHA and CKHU are shown in Table D below, and in comparison to the IBD data in Table B, show annual variation with even "smaller numbers". Again, it is noted that hospital cases represent episodes of hospital care, not necessarily the number of individual patients. (The data for other LHAs are found in Appendix C.)

Table D: Chronic Renal Disease, Hospital Cases and Deaths, Sexes Combined, Trail LHA and CKHU

Year	Hospital Cases		Year	Deaths	
	Trail LHA	CKHU		Trail LHA	CKHU
1988/89	7	32	1988	1	5
1989/90	7	55	1989	1	4
1990/91	13	32	1990	1	8
1991/92	17	47	1991	2	8
1992/93	6	24	1992	2	9
Data Source: Information Systems, Inpatient Programs, Program Standards and Information Management, Regional Programs			Data Source: Division of Vital Statistics B.C. Ministry of Health		

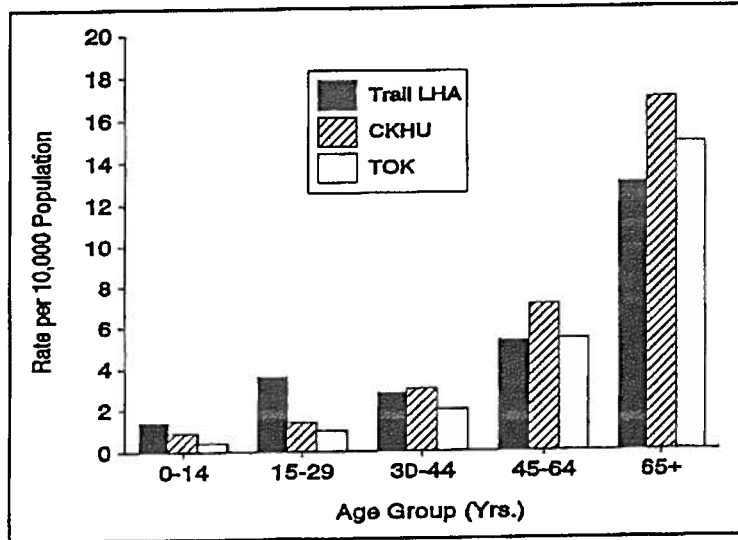
The gender ratio of the CRD hospital cases was also examined for this period, as follows:

- Trail LHA (M/F = 0.94:1)
- CKHU (M/F = 1.36:1)

While the cases in CKHU indicate a higher proportion of males, the cases in Trail LHA are more evenly distributed between both sexes. (Such variation between areas is not unexpected given the small numbers involved.)

Figure 5: Hospitalizations for Chronic Renal Disease, Age Specific Rates Per 10,000 Population, Sexes Combined, 5 Year Cumulative Averages, 1988/89 to 1992/93

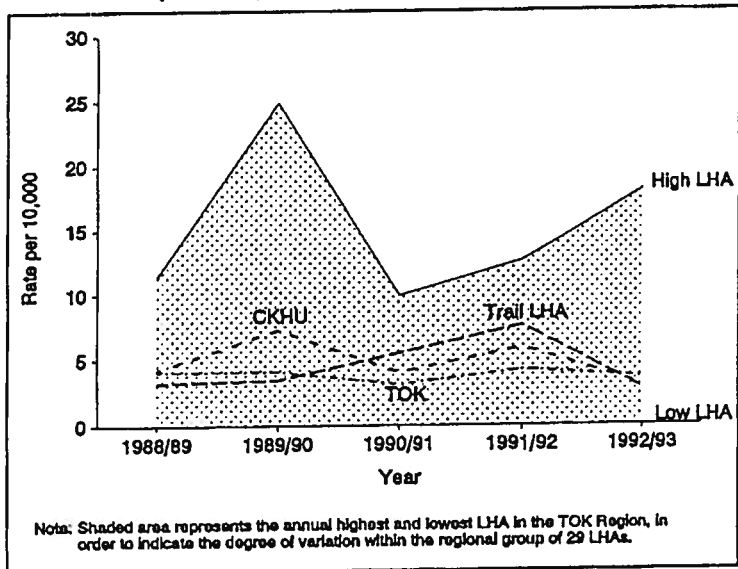
Because of the relatively few cases in each age group per year, the age distribution of the hospital cases was calculated cumulatively for the latest five year period, as shown in Figure 5. For CRD, Trail LHA had hospitalization rates similar to the other areas, although somewhat higher in the younger age groups (actual number of cases in 15-29 year age group was 0-2 cases per year).



Data Source: Information Systems, Inpatient Programs, Program Standards and Information Management, Regional Programs

Figure 6: Chronic Renal Disease, Age Standardized Annual Hospitalization Rates (Cases Per 10,000 Population), 1988/89 to 1992/93

Over the last five years, the Age Standardized Hospitalization Rate for CRD in Trail LHA has varied above and below the rates for CKHU and TOK Region, approximately within the middle third of the range of variation in rates between Highest and Lowest LHA in the TOK Region (See Figure 6).

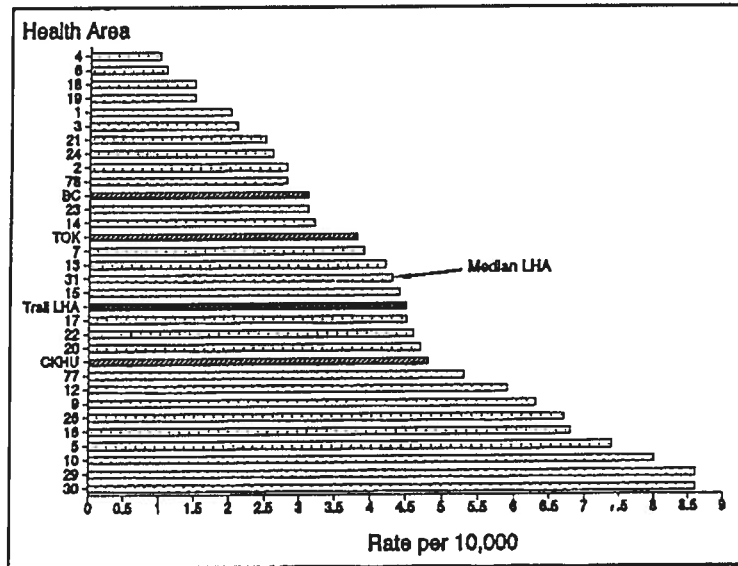


Note: Shaded area represents the annual highest and lowest LHA in the TOK Region, in order to indicate the degree of variation within the regional group of 29 LHAs.

Data Source: Information Systems, Inpatient Programs, Program Standards and Information Management, Regional Programs

Figure 7: Chronic Renal Disease, Age Standardized Hospitalization Rates (Cases Per 10,000 Population), 5 Year Cumulative Averages, 1988/89 to 1992/93

In order to reduce the effect of annual rate variation, Five Year Cumulative Average Age Standardized Hospitalization Rates were also calculated (See Figure 7). In this comparison, Trail LHA occupies an intermediate position between CKHU and TOK Region, which is close to the rate of the Median LHA in the TOK Region. The Trail LHA, CKHU, and TOK Region rates all exceed the provincial average.



Data Source: Information Systems, Inpatient Programs, Program Standards and Information Management, Regional Programs

In order to assess the significance of the CRD hospitalization differences between Trail LHA and CKHU/TOK Region, 95% confidence limits and p-values (two-sided) were calculated, with the following results:

Table E: 95% Confidence Limits and Statistical Significance Tests, Chronic Renal Disease, Age Standardized Hospitalization Rates (Cases Per 10,000 Population), 5 Year Cumulative Averages, 1988/89 to 1992/93

Area	CRD Cases per 10,000	95% Confidence Limits	p-Value*
Trail LHA	4.5	3.2 - 5.7	—
CKHU	4.8	4.1 - 5.5	0.65
TOK Region	3.8	3.5 - 4.0	0.26

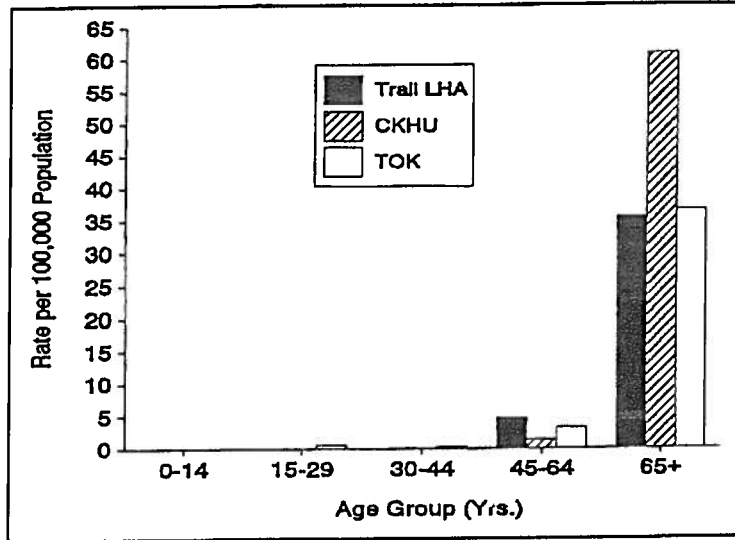
* p-value for difference between Trail and each larger area.

Source: Research and Evaluation Branch, Policy, Planning, and Economics

This review of hospital case rates indicates that the hospitalization rate for Chronic Renal Disease in Trail LHA residents is not significantly different than that of the residents of CKHU and the TOK Region.

Figure 8: Deaths from Chronic Renal Disease, Age Specific Rates Per 100,000 Population, Sexes Combined, 5 Year Cumulative Averages, 1988 to 1992

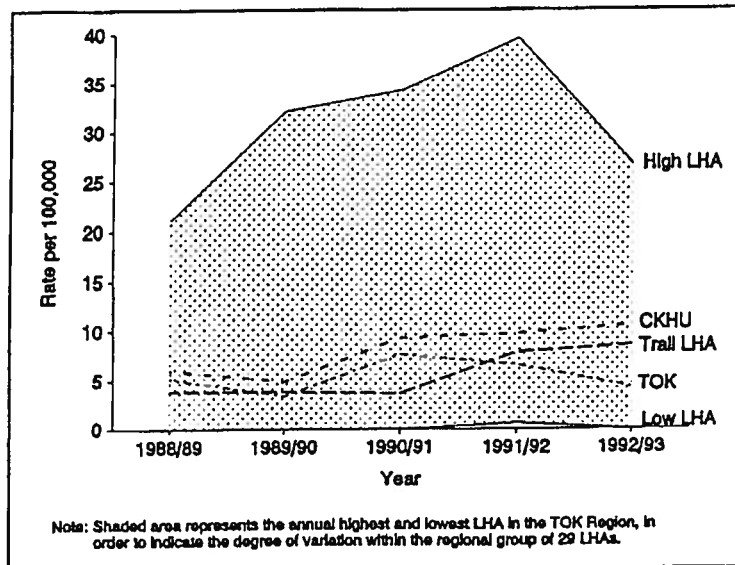
The age specific mortality picture for CRD (see Figure 8) was unremarkable for Trail LHA, although the rate in the elderly was somewhat elevated in CKHU. As these variations by age group are not unexpected with small numbers, the data were then age standardized to facilitate comparisons between areas.



Data Source: Information Systems, Inpatient Programs, Program Standards and Information Management, Regional Programs

Figure 9: Chronic Renal Disease, Age Standardized Annual Mortality Rates (Per 100,000 Population), 1988 to 1992

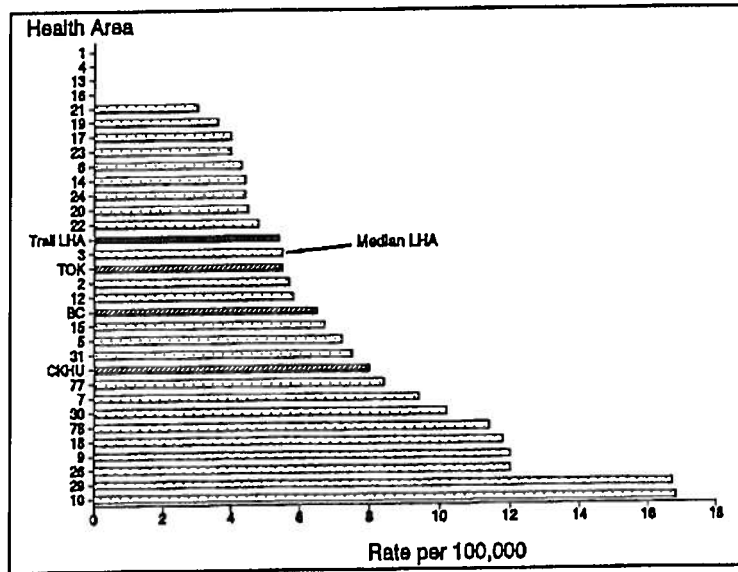
As shown in Table D, there were only 1 or 2 deaths per year due to CRD in Trail LHA, which makes meaningful analysis difficult, particularly for a relatively short time frame. However, the data indicate (see Figure 9) that the Age Standardized Mortality Rate for CRD in Trail LHA has varied within the lower third of the range of variation in rates between Highest and Lowest LHA in the TOK Region.



Data Source: Division of Vital Statistics, B.C. Ministry of Health

Figure 10: Chronic Renal Disease, Age Standardized Mortality Rates (Per 100,000 Population), 5 Year Cumulative Averages, 1988 to 1992

The Five Year Cumulative Average Age Standardized Mortality Rates (see Figure 10) show that the Trail LHA rate is (slightly) lower than CKHU and BC rates, and is immediately adjacent to the TOK and Median LHA rate.



Data Source: Division of Vital Statistics, B.C. Ministry of Health

In order to assess the significance of the CRD mortality rate difference between Trail LHA and CKHU/TOK Region, 95% confidence limits and p-values (two-sided) were calculated, with the following results:

Table F: 95% Confidence Limits and Statistical Significance Tests, Chronic Renal Disease, Age Standardized Mortality Rates (Per 100,000 Population), 5 Year Cumulative Averages, 1988 to 1992

Area	CRD Deaths per 10,000	95% Confidence Limits	p-Value*
Trail LHA	5.4	1.4 - 9.4	-
CKHU	8.0	5.2 - 10.5	0.31
TOK Region	5.5	4.6 - 6.2	1.00

* p-value for difference between Trail and each larger area.

Source: Research and Evaluation Branch, Policy, Planning and Economics

This review of mortality rates, while acknowledging the limitations of an analysis of few deaths, indicates that the mortality experience for Chronic Renal Disease in Trail LHA residents is not significantly different than that of CKHU or TOK Region residents.

DISCUSSION

There are several caveats to a descriptive study of this kind, which limit its ability to determine whether or not an environmental hazard has affected the health of the residents of the community of Trail. To be more specific, even if this analysis had, in fact, indicated a "high" rate of disease for the Trail LHA, this would not necessarily mean that environmental factors were the cause, and similarly, a "low" rate of disease would not necessarily mean that residents were not being adversely affected by environmental factors. In short, because of a number of limitations shown below, these data cannot, unfortunately, be viewed as sensitive, valid, and reliable indicators of possible health effects due to exposure to chemical hazards in the environment. However, there are strengths in this analysis, in view of the comprehensiveness, completeness, and historical nature of the provincial health databases used.

Some specific limitations are as follows:

1. Although cadmium has a toxic effect on the kidney at higher exposure levels, the ICD disease codes were chosen to reflect concerns raised, not because of a prior scientifically-established association between these particular diseases and any particular environmental hazards.
2. As in other jurisdictions, the accuracy by which the individual ICD disease codes are recorded in all areas and for all diseases is unknown. However, it is believed that the impact of potential variation has been minimized by using disease code groupings of conditions with similar clinical presentations.
3. The hospitalization data not only record the occurrence of disease, but also reflect utilization patterns for inpatient services, availability of out-patient services, availability of beds, local medical practices, and perhaps other factors. Also, each hospital separation represents an episode of in-patient hospital care, and does not distinguish between the same patient being admitted several times, or several patients being admitted once during the year.
4. Most treatments required for these conditions would be provided through physicians' offices, from which, unfortunately, no reliable diagnostic data are available on a systematic basis. Neither were data available on hospital emergency room or other out-patient visits. Nevertheless, it is likely that most patients with these conditions would be admitted to hospital at some stage for diagnosis or treatment, and thereby be included in the provincial hospitals database.

5. The disease data on the residents of the community of Trail, population of 8,100, are included with the data on the residents of Trail LHA, population of 20,800. Thus, on the issue of opportunity for potential contact with environmental hazards, the residents of Trail LHA include both "exposed" and "non-exposed" individuals. This issue could be further confused by such other exposure factors as length of residency, occupation, diet, smoking, and community activities. Even if the disease data for the community of Trail were to be disaggregated from the Trail LHA, there are no available environmental exposure data with which to correlate data on disease occurrence.

Notwithstanding the limitations of data of this kind, the major issue of determining what the "expected" burden of disease should be for Trail LHA still remains. The ideal comparison would be with other communities which are similar in all respects except for environmental factors, including such characteristics as geography, availability and nature of health/medical services, socioeconomic level, educational level, racial/ethnic mix, diet, etc. In the absence of obvious ideal comparisons, this report provides several alternative comparisons, including the Central Kootenay Health Unit, the Thompson-Okanagan-Kootenay region as a whole, and the range of Local Health Areas within the whole region.

SUMMARY AND CONCLUSIONS

Hospitalization and mortality data are compiled in a systematic way by the Ministry of Health throughout British Columbia. As Trail Local Health Area is located in the Thompson-Okanagan-Kootenay Region, together with 28 other LHAs, data indicating the range of disease-specific hospitalization and mortality rates for these individual Local Health Areas, the Central Kootenay Health Unit, and the Thompson-Okanagan-Kootenay Region were examined for the bowel and kidney diseases of interest.

For disease diagnostic codes in the Inflammatory Bowel Disease grouping over the last five years, the data indicate that the hospitalization rate for the residents of Trail Local Health Area was significantly lower than the hospitalization rate for the residents of the Central Kootenay Health Unit and the Thompson-Okanagan-Kootenay Region in general. There were no deaths in the Trail Local Health Area due to these diseases.

For disease diagnostic codes in the Chronic Renal Disease grouping over the last five years, the data indicate that the hospitalization rate and mortality rate for the residents of Trail Local Health Area were not significantly different than the rates for residents of the Central Kootenay Health Unit and the Thompson-Okanagan-Kootenay Region in general.

This descriptive review finds no evidence that the residents of Trail Local Health Area are at increased risk of Chronic Renal Disease, in comparison with the residents of Central Kootenay Health Unit and the Thompson-Okanagan-Kootenay Region. It does, however, find that the residents of Trail Local Health Area do have a significantly lower hospitalization rate for Inflammatory Bowel Disease, in comparison with the residents of Central Kootenay Health Unit and the Thompson-Okanagan-Kootenay Region.

ACKNOWLEDGEMENTS

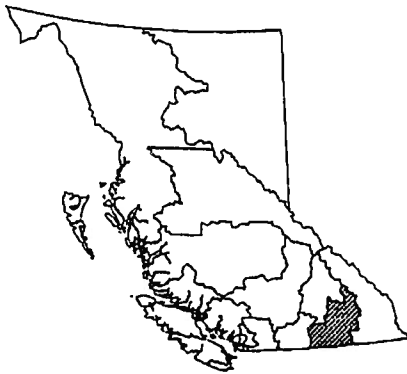
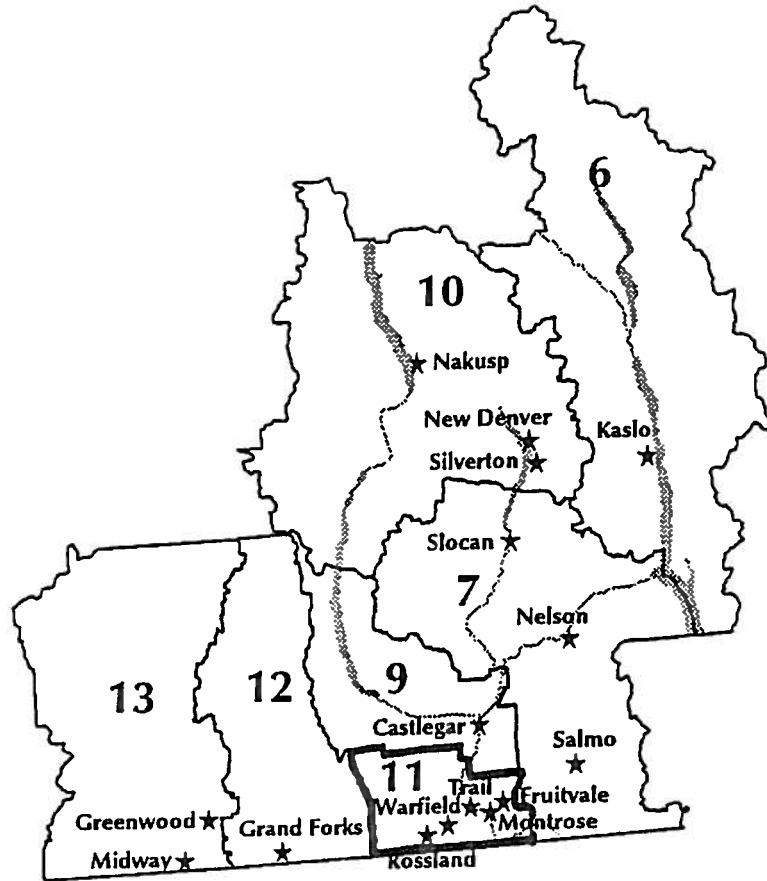
The advice and assistance of the following individuals in the Ministry of Health is acknowledged with appreciation, for their contribution to data access, information analysis, interpretation, and review of the text of this report:

- Dr. Ray Copes, Medical Specialist, Environmental Health Assessment, Health Protection and Safety;
- Mr. Bill Selwood, Senior Research Officer, Information Systems, Inpatient Programs;
- Mr. Soo-Hong Uh, Manager, Research and Statistics Branch, Division of Vital Statistics;
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APPENDIX A

Health Unit 2 Central Kootenay

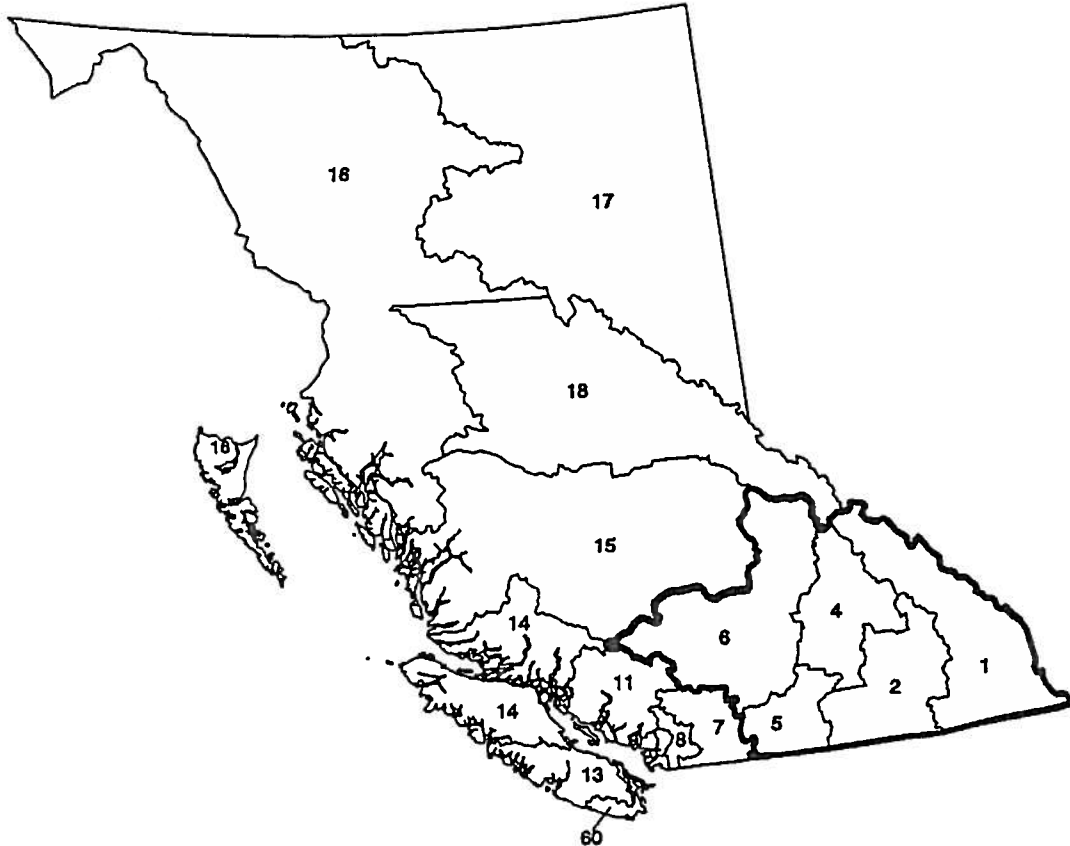


Local Health Areas

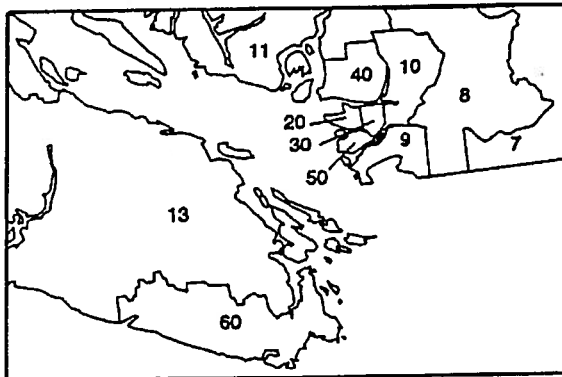
- 6. Kootenay Lake
- 7. Nelson
- 9. Castlegar
- 10. Arrow Lakes
- 11. Trail
- 12. Grand Forks
- 13. Kettle Valley

BRITISH COLUMBIA

Health Units



Lower Mainland



Health Units

- | | |
|--------------------------|-----------------------|
| 1. East Kootenay | 14. Upper Van. Is. |
| 2. Central Kootenay | 15. Cariboo |
| 4. North Okanagan | 16. Skeena |
| 5. South Okanagan | 17. Peace River |
| 6. South Central | 18. Northern Interior |
| 7. Upper Fraser Valley | 20. Vancouver |
| 8. Central Fraser Valley | 30. Burnaby |
| 9. Boundary | 40. North Shore |
| 10. Simon Fraser | 50. Richmond |
| 11. Coast Garibaldi | |
| 13. Central Van. Is. | |

APPENDIX B

Region	Local Health Area
001 East Kootenay	001 Fernie 002 Cranbrook 003 Kimberley 004 Windermere 005 Creston 018 Golden
002 Central Kootenay	006 Kootenay Lake 007 Nelson 009 Castlegar 010 Arrow Lakes 011 Trail 012 Grand Forks 013 Kettle Valley
004 North Okanagan	019 Revelstoke 020 Salmon Arm 021 Armstrong/Spallumcheen 022 Vernon 078 Enderby
005 South Okanagan	014 Southern Okanagan 015 Penticton 016 Keremeos 017 Princeton 023 Central Okanagan 077 Summerland
006 South Central	024 Kamloops 026 North Thompson 029 Lillooet 030 South Cariboo 031 Merritt

Note: Only health jurisdictions in the
Thompson-Okanagan-Kootenay
Region included in this print-out.

HOSPITALIZATIONS FOR INFLAMMATORY BOWEL DISEASE, AGE SPECIFIC RATES PER 10,000 POPULATION, SEXES COMBINED (5 YEAR TOTALS)

FIGURE 2

LHA	1988/89 to 1992/93						Total (Crude Rate)
	0-14	15-29	30-44	45-64	65+		
HU 1	1	23.5	21.9	21.7	26.4	62.1	25.7
	2	17.6	22.9	21.7	13.9	41.7	21.4
	3	10.8	30.5	11.6	15.1	34.7	19.3
	4	15.6	17.8	15.5	28.4	32.0	20.3
	5	2.9	8.0	8.1	6.5	30.7	11.6
HU 4	18	16.8	23.9	13.9	17.7	18.6	17.9
	6	16.2	21.3	17.6	16.9	38.0	20.2
	7	26.0	25.8	20.8	27.8	68.1	32.8
	9	28.2	22.6	20.3	15.2	48.6	25.3
	10	37.3	49.9	29.4	30.4	51.7	38.3
CKHU	TRAIL	89.7	57.8	43.8	23.1	127.2	65.4
	12	17.2	22.1	16.2	8.1	16.6	15.9
	13	13.5	15.6	23.5	6.6	24.6	16.3
	13	2.8	16.4	24.0	13.5	30.4	16.2
	19	27.7	28.6	22.5	15.8	42.0	26.2
HU 5	20	20.0	26.8	12.9	22.2	48.4	22.8
	21	14.8	26.2	17.5	15.2	25.4	19.3
	22	20.1	17.9	26.2	18.6	37.1	23.4
	22	15.7	17.6	12.7	19.0	33.3	18.8
	78	54.1	23.9	28.4	31.6	81.1	42.5
HU 6	14	18.5	21.3	15.9	18.8	34.8	21.0
	14	26.2	13.6	24.2	16.6	31.7	22.9
	15	6.5	16.0	17.0	9.4	19.5	13.9
	16	5.2	10.3	15.0	8.6	22.6	12.4
	17	30.0	35.4	28.7	19.3	60.1	32.2
HU 6	23	14.7	17.0	10.9	13.0	24.1	15.6
	77	13.7	31.0	24.6	20.5	35.1	25.2
	24	14.3	17.6	14.3	13.1	25.3	16.8
	26	20.6	24.8	18.4	17.9	37.2	22.0
	29	16.7	24.2	11.5	19.4	116.7	24.6
Other	30	25.0	41.6	14.3	23.6	105.1	38.1
	30	30.7	27.8	51.5	28.4	59.3	37.3
	31	69.5	43.0	28.9	38.5	55.1	46.3
	Other	26.3	27.4	20.9	20.8	45.6	25.8
	Total	19.7	16.2	13.1	11.7	23.5	16.1
TOK	Total	19.7	17.1	13.8	12.5	25.4	17.0
	TOK	20.0	22.5	17.7	16.6	33.5	21.2

Figures 3,4,6,7,9,10

AGE STANDARDIZED RATES*
Sexes Combined, BC, 1988/89—1992/93 (Five year total)

HOSPITALIZATIONS
INFLAMMATORY BOWEL DISEASE
RATES PER 10,000 POPULATION

LHA	88/89	89/90	90/91	91/92	92/93	5 Yr. Total
1	29.9	25.4	33.7	25.6	26.0	28.1
2	24.1	16.9	22.4	23.0	24.4	22.1
3	20.5	18.8	15.8	24.5	16.4	19.2
4	11.4	12.3	20.9	22.4	36.5	20.7
5	11.2	11.3	6.2	13.2	6.0	9.6
18	24.6	15.6	12.3	18.9	19.8	18.0
HU 1	22.2	17.3	20.0	21.9	21.6	20.6
6	18.3	28.3	49.0	30.3	25.5	30.3
7	27.6	17.2	29.9	29.1	21.1	25.0
9	37.4	24.5	36.5	45.6	47.7	38.5
10	70.9	64.1	50.7	80.7	46.6	62.5
TRAIL	30.6	17.1	9.9	7.5	16.0	16.2
12	6.1	14.8	5.2	25.2	26.4	16.5
13	29.1	22.4	17.0	6.4	16.2	16.8
CKHU	30.2	21.6	24.2	27.3	26.4	26.0
19	24.8	22.4	22.0	23.6	27.9	24.1
20	15.0	25.3	18.4	17.7	20.9	19.4
21	28.7	28.6	19.7	13.9	24.4	23.0
22	17.7	23.5	15.6	23.1	11.8	18.2
78	71.9	36.6	27.5	38.6	25.5	39.8
HU 4	21.8	25.0	17.8	21.9	17.0	20.6
14	15.2	27.9	18.1	20.4	26.6	21.7
15	12.4	15.7	12.0	14.7	12.6	13.5
16	3.6	12.9	20.5	13.8	7.4	11.7
7	36.9	26.8	35.2	35.7	31.7	32.6
23	13.9	14.7	14.3	17.7	14.5	15.1
77	22.5	19.5	28.8	28.7	22.1	24.3
HU 5	14.4	16.6	15.6	18.4	15.8	16.2
24	27.4	24.0	21.4	20.7	19.5	22.5
26	38.6	29.8	30.9	28.8	24.3	30.2
29	66.7	21.5	12.2	37.2	42.3	35.8
30	37.5	32.2	48.6	41.2	32.4	38.5
31	47.7	41.2	50.2	55.9	31.4	45.3
HU 6	32.0	26.3	25.7	28.1	22.6	26.5
Other	17.0	16.1	15.9	18.1	15.7	16.2
Total	17.9	16.9	16.5	17.1	16.4	16.9
TOK	22.8	20.9	19.9	22.1	19.5	21.0

* Standardized to B.C. Population, 1991

HOSPITALIZATIONS
CHRONIC RENAL DISEASE
RATES PER 10,000 POPULATION

LHA	88/89	89/90	90/91	91/92	92/93	5 Yr. Total
1	0.8	2.8	3.2	2.3	1.2	2.8
2	2.4	3.5	3.1	4.5	0.6	2.8
3	4.9	0.0	1.1	2.1	2.8	2.1
4	0.0	3.4	0.0	0.0	1.7	1.0
5	5.3	9.1	9.2	7.3	6.5	7.4
18	0.0	3.0	0.0	1.4	3.3	1.5
HU 1	2.4	3.4	3.4	3.8	2.2	3.0
6	0.0	6.0	0.0	0.0	0.0	1.1
7	4.2	3.3	2.6	5.8	3.9	3.9
9	6.8	12.8	4.8	6.8	0.9	6.3
10	5.6	21.1	6.6	4.1	3.4	8.0
TRAIL	3.2	3.4	5.5	7.6	2.7	4.5
12	4.8	11.4	4.0	6.3	3.7	5.9
13	3.3	6.8	0.0	2.6	8.5	4.2
CKHU	4.2	7.3	4.0	5.9	3.0	4.8
19	3.0	0.0	0.0	1.7	3.0	1.5
20	6.3	3.5	2.9	6.8	4.4	4.7
21	5.1	5.3	1.1	0.0	2.0	2.5
22	5.1	4.3	3.7	5.7	4.6	4.8
78	1.4	6.4	4.0	1.3	1.3	2.8
HU 4	5.0	4.0	3.1	5.0	4.0	4.1
14	2.2	3.7	4.8	2.4	3.2	3.2
15	7.5	2.8	2.3	3.7	5.6	4.4
16	6.6	6.7	2.2	0.0	18.1	6.8
17	11.4	1.8	4.0	3.6	1.9	4.5
23	4.0	2.6	2.4	4.1	2.9	3.1
77	6.8	4.0	2.1	7.2	6.4	6.3
HU 5	5.1	2.9	2.6	4.0	3.9	3.6
24	2.7	2.8	2.3	2.3	3.1	2.6
26	6.3	24.9	0.0	1.7	2.4	6.7
29	6.2	21.6	3.0	8.3	5.2	8.6
30	1.9	8.6	9.9	12.6	9.3	8.6
31	2.1	3.7	6.3	3.2	6.4	4.3
HU 6	3.0	4.8	3.1	3.3	4.0	3.6
Other	3.4	3.1	2.8	2.6	2.8	2.9
Total	3.5	3.3	2.9	2.9	2.9	3.1
TOK	4.1	4.1	3.1	4.2	3.6	3.8

DEATHS
CHRONIC RENAL DISEASE
RATES PER 100,000 POPULATION

LHA	88/89	89/90	90/91	91/92	92/93	5 Yr. Total
1	0.0	0.0	0.0	0.6	0.0	0.0
2	6.5	6.4	10.4	0.6	5.6	5.7
3	9.6	0.0	0.0	18.5	0.0	5.5
4	0.0	0.0	0.0	0.6	0.0	0.0
5	11.5	5.8	11.1	0.6	0.0	7.2
18	0.0	0.0	30.3	28.1	0.0	11.8
HU 1	6.7	3.4	7.8	5.2	1.5	6.0
6	0.0	0.0	0.0	0.6	22.4	4.3
7	13.0	0.0	12.7	9.1	13.1	9.4
9	8.7	0.0	17.4	28.2	8.6	12.0
10	0.0	17.6	33.0	17.4	18.8	16.8
TRAIL	3.9	3.9	3.7	7.9	8.6	5.4
12	0.0	20.7	0.0	0.6	9.4	5.8
13	0.0	0.0	0.0	0.6	0.0	0.0
CKHU	6.0	4.9	9.3	9.8	10.6	8.0
19	19.5	0.0	0.0	0.6	0.0	3.6
20	12.2	0.0	3.1	5.8	2.6	4.5
21	0.0	0.0	0.0	0.6	15.4	3.0
22	3.7	3.7	8.5	7.1	1.8	4.8
76	0.0	17.9	13.5	0.6	26.8	11.4
HU 4	6.5	2.8	6.0	5.5	4.5	4.9
14	3.7	9.5	6.8	0.6	3.1	4.4
15	9.4	1.9	8.6	8.8	5.9	6.7
16	0.0	0.0	0.0	0.6	0.0	0.0
17	0.0	0.0	20.2	0.6	0.0	4.0
23	2.2	2.2	5.7	7.6	2.6	4.0
77	0.0	11.6	10.7	11.1	0.0	8.4
HU 5	3.7	3.4	7.0	7.2	3.1	4.8
24	3.0	1.2	8.1	3.6	5.5	4.4
26	21.1	0.0	0.0	36.6	0.0	12.0
29	0.0	32.2	30.5	0.6	0.0	18.7
30	0.0	0.0	34.3	17.2	0.0	10.2
31	15.1	0.0	14.0	0.6	0.0	7.5
HU 6	4.6	2.3	11.1	5.3	4.2	6.9
Other	6.6	6.3	6.4	7.5	7.3	6.8
Total	6.3	5.8	6.6	7.3	6.8	6.5
TOK	5.2	3.4	7.7	6.6	4.3	5.5

HOSPITALIZATIONS FOR CHRONIC RENAL DISEASE, AGE SPECIFIC RATE PER 10,000 POPULATION, SEXES COMBINED (5 YEAR TOTALS)

FIGURE 5

LHA		1988/89 to 1992/93						Total (Crude Rate)
		0-14	15-29	30-44	45-64	65+		
HU 1	1	0.0	0.0	0.0	3.0	11.3	1.9	
	2	0.0	0.4	0.0	2.7	17.1	2.2	
	3	0.0	0.0	1.0	2.2	11.6	2.6	
	4	0.0	0.0	0.0	1.4	5.8	0.8	
	5	0.0	3.4	6.1	16.3	14.9	8.7	
	18	0.0	1.2	1.0	4.8	0.0	1.4	
CKRHU	6	0.0	0.7	0.9	5.1	12.8	2.8	
	7	0.0	0.0	0.0	5.6	0.0	1.2	
	9	0.0	0.5	1.8	5.1	16.9	4.1	
	10	0.0	0.8	6.4	12.1	16.3	6.4	
	19	0.0	0.0	0.0	0.0	55.6	10.2	
	22	0.0	0.0	0.0	5.3	13.0	4.8	
HU 4	12	1.4	1.4	4.7	13.2	12.3	6.7	
	13	0.0	0.0	0.0	8.1	20.2	4.4	
	19	0.9	1.4	3.0	7.1	17.0	5.2	
	20	0.0	1.0	0.0	1.2	8.5	1.2	
	21	0.0	0.4	4.3	5.0	20.2	5.7	
	22	0.0	0.0	0.0	7.5	8.4	2.8	
HU 5	78	1.2	0.6	1.3	8.1	18.3	5.2	
	14	0.0	0.0	0.0	3.9	17.1	3.5	
	15	0.6	0.5	0.0	6.3	17.6	4.7	
	16	0.3	2.0	2.9	4.3	12.7	4.7	
	17	0.0	0.0	2.0	6.7	16.0	5.8	
	17	0.0	0.0	15.0	8.6	10.1	7.2	
HU 6	23	0.0	0.0	7.2	3.5	15.8	4.7	
	23	0.6	1.5	1.9	3.6	11.9	3.7	
	77	1.1	0.0	0.0	15.6	15.4	7.4	
	24	0.5	1.3	2.3	5.0	13.2	4.5	
	26	0.0	0.7	0.9	3.8	11.6	2.3	
	29	1.7	2.0	4.9	0.0	36.9	4.8	
Other	30	0.0	4.0	1.8	0.0	57.3	6.5	
	30	1.2	1.3	3.5	7.1	45.8	7.6	
	31	0.0	0.9	6.6	6.7	8.8	3.9	
	HU 6	0.2	1.0	1.8	4.0	16.5	3.1	
	Total	1.5	1.2	1.3	3.4	10.3	2.9	
	TOK	1.4	1.2	1.4	3.8	11.2	3.1	
TOK	0.4	1.0	2.0	5.4	14.9	4.1		

DEATHS DUE TO CHRONIC RENAL DISEASE
 AGE SPECIFIC RATE PER 100,000 POPULATION, SEXES COMBINED (5 YEAR TOTALS)

FIGURE 8

LHA	1988 to 1992						Total
	0-14	15-29	30-44	45-64	65+		
LHA	1	0.0	0.0	0.0	0.0	0.0	0.0
	2	0.0	0.0	0.0	4.5	37.9	4.5
	3	0.0	0.0	0.0	0.0	43.4	7.1
	4	0.0	0.0	0.0	0.0	0.0	0.0
	5	0.0	0.0	0.0	8.1	43.9	11.4
	18	0.0	0.0	0.0	0.0	93.0	5.6
HU 1	6	0.0	0.0	0.0	2.8	35.2	4.5
	7	0.0	0.0	0.0	0.0	34.1	6.2
	9	0.0	0.0	0.0	0.0	74.3	10.2
	10	0.0	0.0	0.0	0.0	95.3	11.8
	TRAIL	0.0	0.0	0.0	4.8	132.5	22.1
	12	0.0	0.0	0.0	0.0	35.5	6.8
CKRD	13	0.0	0.0	0.0	0.0	46.0	7.8
	19	0.0	0.0	0.0	1.3	0.0	0.0
	20	0.0	0.0	0.0	0.0	60.8	9.3
	21	0.0	0.0	0.0	0.0	28.4	2.3
	22	0.0	13.8	0.0	6.2	25.8	6.0
	78	0.0	0.0	0.0	0.0	0.0	5.8
HU 4	14	0.0	1.1	0.0	16.8	64.0	14.2
	15	0.0	0.0	0.0	3.8	30.8	5.8
	16	0.0	0.0	0.0	5.4	26.5	7.9
	17	0.0	0.0	0.0	2.8	48.9	11.4
	23	0.0	0.0	0.0	0.0	0.0	0.0
	77	0.0	0.0	0.8	2.5	31.6	4.2
HU 5	24	0.0	0.6	0.0	2.5	24.3	5.1
	26	0.0	1.1	0.0	9.7	51.4	14.7
	29	0.0	0.0	0.0	3.1	31.3	6.9
	30	0.0	0.0	16.4	3.4	27.8	8.8
	31	0.0	0.0	0.0	0.0	61.4	8.8
	Other	0.0	0.0	0.0	23.6	95.6	13.1
HU 6	Total	0.0	0.0	0.0	0.0	80.9	8.2
	Other	0.0	0.8	0.0	9.6	44.1	5.8
	Total	0.0	0.1	0.7	4.4	36.9	4.7
TOK	Other	0.0	0.2	0.3	3.1	47.7	6.5
	Total	0.0	0.6	0.3	3.2	45.6	6.5
		0.0	0.6	0.3	3.2	36.5	6.2