Bobby Jindal
GOVERNOR

Alan Levine
SECRETARY

State of Louisiana

Department of Health and Hospitals

Office of the Secretary

April 9, 2009

The Honorable Kay Katz, Chair
House Health and Welfare Committee
State Capital
P.O. Box 44486
Baton Rouge, LA 70804

Dear Representative Katz:

In response to Senate Concurrent Resolution No. 92 (SCR 92) of the 2008 Regular Session, the Louisiana Department of Health and Hospitals (DHH) submits the enclosed report. The resolution requests that DHH address whether there is a higher cancer rate in the Livonia and Fordoche areas of the state of Louisiana and if so to determine the cause of such an abnormality.

The Office of Public Health within DHH is available to discuss the enclosed report and recommendations with you and the members of the House Health and Welfare Committee. Please contact Dr. Rony Francois, assistant secretary of the Office of Public Health, at (225) 342-8093 with any questions or comments you may have.

Sincerely,

Alan Levine
Secretary

Enclosures

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April 9, 2009

The Honorable Willie Mount, Chair
Senate Health and Welfare Committee
State Capital
P.O. Box 94183
Baton Rouge, LA 70804

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REPORT TO
THE LOUISIANA SENATE HEALTH AND WELFARE COMMITTEE
&
THE LOUISIANA HOUSE HEALTH AND WELFARE COMMITTEE

PURSUANT TO SENATE CONCURRENT RESOLUTION 92
OF THE 2008 REGULAR LEGISLATIVE SESSION

PREPARED BY
DEPARTMENT OF HEALTH & HOSPITALS
OFFICE OF PUBLIC HEALTH (OPH), SECTION FOR ENVIRONMENTAL EPIDEMIOLOGY & TOXICOLOGY (SEET),
IN COLLABORATION WITH
OPH SAFE DRINKING WATER PROGRAM AND
LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY

LIVONIA/FORDOCHE HEALTH STUDY
FEBRUARY 2009

SUMMARY

The main goal of this study was "to investigate the high rates of cancer in Livonia and Fordoche" as requested by Senate Concurrent Resolution # 92 by Senator Marionneaux.

The objectives specified in the resolution were to:

- *Study whether there exists a higher cancer rate in the Livonia and Fordoche areas relative to other areas in Louisiana*
- *Determine the causes of such abnormality, if such abnormality exists*
- *Present the conclusions of such study in a written report to the Senate Health and Welfare Committee and the House Health and Welfare Committees prior to the 2009 Regular Session of the Louisiana Legislature*

The sources of data used to evaluate the cancer incidence and mortality were from the Louisiana Tumor Registry, the National Cancer Institute Surveillance, Epidemiology and End Results, the State's Vital Statistics and the Louisiana Hospital Inpatient Discharge Data. The most extensive data span the period 1988 to 2007. Other data sources had a shorter duration.

In summary the incidence of cancer in the Livonia and Fordoche area, Pointe Coupee parish and the state were similar. **There is no higher rate of cancer in Livonia/Fordoche or in Pointe Coupee when compared with the state**. In addition, mortality and hospital discharge data did not show any consistent pattern of higher rates either. The distribution of cancer b01y sites shows a pattern similar to that observed in Louisiana or the US.

The perception of a high incidence of cancer may come from the observation that one of seven households in the Livonia /Fordoche area has a person living with cancer or recently (past 4 years) died of cancer. However, this observation is consistent with US data that estimates one of eight households has a similar record. For example, two random areas of Metairie had cancer in 1 out of five to six households.

This study was prepared by the Louisiana Department of Health, Office of Public Health, Section for Environmental Epidemiology & Toxicology in collaboration with the Safe Drinking Water program and the Louisiana Department of Environmental for the environmental data.

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Livonia Fordoche Health Study

1. Introduction

1.1. Goals and objectives

The main goal of this study was "to investigate the high rates of cancer in Livonia" as requested by Senate Concurrent Resolution # 92 by Senator Marionneaux.

The objectives specified in the resolution were to:

- *Study whether there exists a higher cancer rate in the Livonia and Fordoche areas relative to other areas in Louisiana*
- *Determine the causes of such abnormality, if such abnormality exists*
- *Present the conclusions of such study in a written report to the Senate Health and Welfare Committee and the House Health and Welfare Committees prior to the 2009 Regular Session of the Louisiana Legislature*

1.2. Background information

Several community members had expressed concerns about the perceived high number of cancer cases in the Livonia and Fordoche area. A Baton Rouge television station (WBRZ) even presented these concerns in a segment called "Medical Mystery" in the Fall of 2007. In that same segment, concerns were expressed about drinking water. At a site visit carried out on June 6, 2008, Livonia residents expressed concerns about:

1. Occupational hazards in the local petrochemical plants and in the agricultural industry
2. Exposure to hazardous chemicals transported on the railroads crossing the community
3. Exposure to hazardous chemicals in local drinking water. (The primary drinking water source is the municipal water system).

1.3. Population

Population data is very important in assessing incidence or prevalence of any disease. The Livonia and Fordoche area will be referred to as "LF" in this report.

1.3.1. Livonia

According to the United States Census Bureau, the town has a total area of 1.8 square miles (4.7 km²), all of it land surface. As of the census of 2000, there were 1,339 people, 502 households, and 380 families residing in the town. The population density was 741.3 people per square mile (285.6/km²). There were 545 housing units at an average density of 301.7/sq mi (116.3/km²). The racial makeup of the town was 91.04% White, 8.51% African American, 0.15% Asian, and 0.30% from two or more races. Hispanic or Latino of any race were 0.60% of the population. There were 502 households out of which 40.4% had children under the age of 18 living with them, 63.9% were married couples living together, 7.8% had a female householder with no husband present, and 24.3% were non-families. Twenty one percent (21.5%) of all households were made up of individuals and 11.0% had someone living alone who was 65 years of age or older. The average household size was 2.67 and the average family size was 3.10. In the town the population was spread out with 28.2% under the age of 18, 8.6% from 18 to 24, 32.3% from 25 to 44, 21.4% from 45 to 64, and 9.5% who were 65 years of age or older. The median age was 33 years. For every 100 females there were 96.0 males. For every 100 females age 18 and over, there were 93.0 males. The median income for a household in the town was $37,000, and the median income for a family was $42,721. Males had a median income of $36,685 versus $22,036 for females. The per capita income for the town was $16,756. About 7.9% of families and 13.2% of the population were below the poverty line, including 13.4% of those under age 18 and 24.8% of those age 65 or over.

Livonia is in Zip Code 70755 which include 2,392 inhabitants based on the Year 2000 census data.

1.3.2. Fordoche

According to the United States Census Bureau, the town has a total area of 2.4 square miles (6.3 km²), all of it land surface. As of the census of 2000, there were 933 people, 341 households, and 285 families residing in the town. The population density was 383.8 people per square mile (148.2/km²). There were 361 housing units at an average density of 148.5/sq mi (57.4/km²). The racial makeup of the town was 90.68% White, 8.57% African American, 0.11% Asian, and 0.64% from two or more races. Hispanic or Latino of any race were 0.75% of the population.

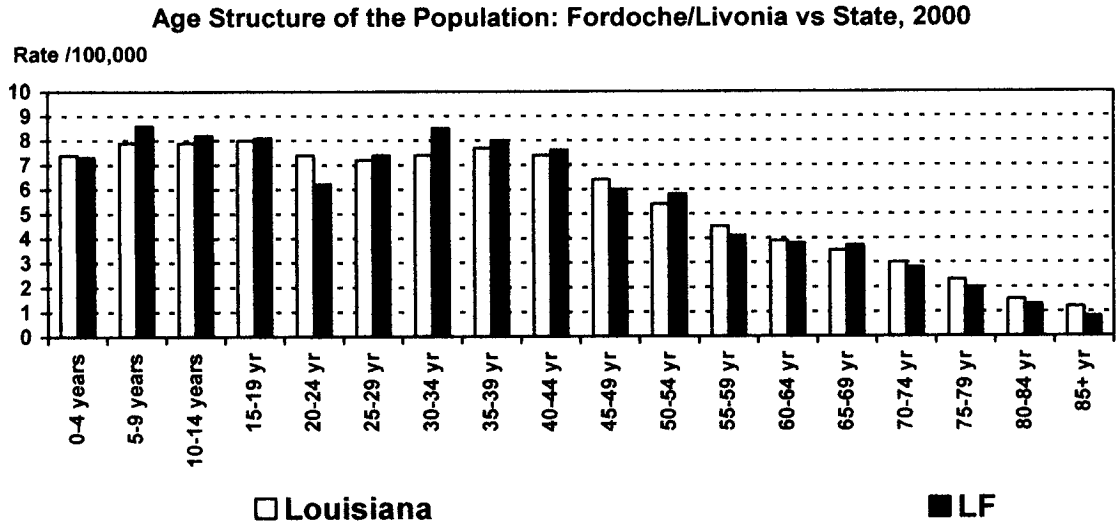
There were 341 households out of which 37.0% had children under the age of 18 living with them, 72.4% were married couples living together, 6.5% had a female householder with no husband present, and 16.4% were non-families. Thirteen percent (13.8%) of all households were made up of individuals and 5.0% had someone living alone who was 65 years of age or older. The average household size was 2.74 and the average family size was 2.99. In the town the population was spread out with 25.3% under the age of 18, 8.7% from 18 to 24, 28.3% from 25 to 44, 24.0% from 45 to 64, and 13.7% who were 65 years of age or older. The median age was 37 years. For every 100 females there were 99.4 males. For every 100 females age 18 and over, there were 103.2 males. The median income for a household in the town was $36,364, and the median income for a family was $40,313. Males had a median income of $32,400 versus $21,146 for females. The per capita income for the town was $15,223. About 12.1% of families and 14.8% of the population were below the poverty line, including 16.6% of those under age 18 and 20.3% of those age 65 or over.

Fordoche is in Zip Code 70732 which include1,058 inhabitants based on the Year 2000 Census data.

1.3.3. Age structure of the population

The frequency of cancers is related to age therefore it is important to look at the age structure of the population. The composition of the populations of Livonia & Fordoche is very similar to the state population.

Figure 1: Age structure of the population: LF vs State, 2000



When comparing cancer rates it is important to compare population of similar age structure. If age structures are different, a statistical method called age adjustment is used.

1.4. Cancer Statistics

The main sources of cancer data in Louisiana are the Louisiana Tumor Registry and the Vital Statistics Mortality Data. Hospital Discharge data may also be a source of secondary importance.

1.4.1. The Louisiana Tumor Registry (LTR)

The Louisiana Tumor Registry is composed of a central office and regional registries that collect and process cancer incidence data from the state's eight established geographic regions. Each regional registry is responsible for the complete ascertainment of data on cancer diagnoses and treatment in its region(s) within six months of diagnosis. Every healthcare provider is required by law to report this information to the regional registries, which work with them to ensure complete state coverage. About one fourth of all hospitals in Louisiana maintain their own cancer registries and report about 60% of the state's total number of incident cases. The LTR's regional registries are responsible for abstracting the remaining cases from hospitals and other facilities.

In addition, any previously unrecognized cancer diagnoses identified among residents of Louisiana through death certificates are traced back to patient records in hospitals or other facilities in order to be abstracted. Otherwise, the case is considered a "death-certificate-only (DCO)" case and the date of death is recorded as the date of diagnosis.

Interstate exchange of data began in 1997. This permits the LTR to obtain cancer data from participating states on residents of Louisiana who have traveled out-of-state for cancer diagnosis and/or treatment. This exchange of data ensures a higher level of case ascertainment and data completeness. Strict protocols on patient confidentiality are followed.

The Louisiana Tumor Registry "has submitted over 5 years of data and passed rigorous criteria for each single year's data, including completeness of reporting, non-duplication of records, percent unknown in critical data fields, percent of cases registered with information from death certificates only, and internal consistency among data items" (Quote from ACS 2008 Cancer Facts & Figures). Statewide data are available from 1988 to present.

The data from LTR has been checked and considered final for the period 1988 to 2004. Data from 2005 to 2007 is available and accurate within a few cases, however it is not considered final. Therefore any statistics will be broken down in two periods: 1988-2004 and 2005-2007.

1.4.2. The National Cancer Institute Surveillance, Epidemiology, and End Results (SEER)

The Surveillance, Epidemiology, and End Results (SEER) Program of the National Cancer Institute is an authoritative source of information on cancer incidence and survival in the United States. SEER currently collects and publishes cancer incidence and survival data from population-based cancer registries covering approximately 26 percent of the US population. The SEER Program registries routinely collect data on patient demographics, primary tumor site, tumor morphology and stage at diagnosis, first course of treatment, and follow-up for vital status. The SEER Program is the only comprehensive source of population-based information in the United States that includes stage of cancer at the time of diagnosis and patient survival data. From 1974 to 1977 New Orleans was included in SEER and in 2001 the SEER Program expanded coverage to include the entire state of Louisiana.

1.4.3. Vital Statistics Mortality Data

Mortality information presented in this report is gathered from data recorded on the Certificate of Death for deaths that occurred to Louisiana residents. All original death certificates flow to the Vital Records Registry. Data are recorded on death certificates by funeral directors, who solicit demographic information from available next of kin, and by physicians or coroners, who record information on time, place, and cause of death. Louisiana law requires that funeral directors send death certificates to the Vital Records Registry within five days of the occurrence of a death, and that the identities of persons included in the death registry be kept confidential. Death statistics are compiled in accordance with World Health Organization (WHO) regulations, which require member nations to classify causes of death according to the revision of the International Statistical Classification of Diseases, Injuries, and Causes of Death in effect at the time of death. Deaths that occurred from 1999 to present are coded in accordance with the tenth revision (ICD-10).

All of the causes of death described in this report are underlying causes of death, defined as the disease or injury that initiated the sequence of events leading to death. Secondary causes of death are not considered. Death registration in Louisiana is considered to be 100% complete, since a death certificate must be filed before a burial permit may be obtained.

1.4.4. Louisiana Hospital Discharge Data (LaHIDD)

Louisiana hospitals are required by law to submit inpatient discharge data to DHH/OPH. Yearly LaHIDD datasets contain parish, age, admit date, demographic data, diagnosis and outcome information on all hospital admissions. Datasets are available for 1999 through 2004 for inpatients. The main discharge diagnosis and up to 8 secondary discharge diagnoses are listed. These diagnoses are coded according to ICD-9 (International Classification of Disease, version 9).

2. Statistical review

Several measurements are used to describe how much of any disease exists in a population. These measurements are commonly used in cancer epidemiology. To understand the measurements used in evaluating cancer in the LF population, it may be useful to explain some of the basic assumptions and tools used in cancer epidemiology.

Cancer is a common disease: The lifetime probability of having a cancer is about 45% for males (about 1/2) and about 37% for females (about 1/3).

Incidence rate: Incidence rate is the number of new cases occurring in a specific population during a specific period of time. Incidence rates are typically expressed as cases per hundred thousand population per year. For example, the American Cancer Society estimates that there will be 23,000 new cases of cancer in 2008 in Louisiana. The actual incidence rate was calculated by the American Cancer Society at 615.7 /100,000 for males and 402.4 /100,000 for females in 2000-2004 in Louisiana. Incidence rates are usually used to compare cancer in different populations.

The "Age Problem": The risk of developing cancer increases with age.

Cancer Site	Age group	Gender	Probability of developing cancer	
			In percent	In fraction (rounding)
All cancers	Birth to 39 yrs	M	1.4	1 / 70
		F	2.0	1 / 50
All cancers	40 to 59 years	M	8.6	1 /12
		F	8.9	1 /11
All cancers	60 to 69 years	M	16.2	1 / 6
		F	10.4	1 / 10
All cancers	70 and over	M	38.9	1 / 3
		F	26.3	1 / 4

Since cancer is a disease that shows huge increases with age, populations with more elderly people would always show higher rates. One solution is to compare age specific rates (The age-specific rate is the number of cancer cases or deaths occurring in persons in a given age group divided by the population in that age group in a given period expressed per 100,000 persons, for example, the number of cancer cases occurring in people age 60 to 65/100,000). However, this approach would be too cumbersome because there are too many age specific rates.
The solution to allow a comparison between two populations of different age structure is to use the "Age Adjustment" (AA) method. This method consists of applying age specific rates to a standard population, for example the 2000 US Standard population. Florida is a state with a high proportion of elderly people, therefore, its crude rate of cancer is expected to be high and it could not be fairly compared with another state with a much younger population. In 2003 the state of Florida had 94,910 cancer cases, the crude incidence rate was 545.5 /100,000 and the age adjusted rate (US Population 2000) was only 431.6.

Gender is less of a problem since most populations have about an even number of males and females. However, males have much higher rates of cancer than females. The US AA cancer incidence for 2000-2004 was 557.8 for males and 413.3 for females.

Using Age Adjusted Standard Incidence Ratio (AA-SIR) to compare rates: One of the most convenient ways to compare rates between two populations is to use AA-SIRs. The best way to explain AA-SIR is to take the example of the comparison of Livonia and Fordoche and Louisiana. For each age group, the LF population of the age group is multiplied by the Louisiana rate for that age group. This will produce a hypothetical (or expected) number of cases in that age group if the rate was similar to the state. All the age groups are added together to have an expected total number of cases. This observed total number is then divided by the actual total number expected in LF.

If the SIR is 1,	then the cancer incidence is similar
If the SIR is below 1	then the cancer incidence is lower in the observed population
If the SIR is above 1	then the cancer incidence is higher in the observed population

For example for the period 1988 to 2004 there were 134 cancer cases (observed) among males in LF. Using LF age group population and applying the state rates for the same period, the number of expected cases is 151. Therefore the AA-SIR is 134 / 151 = 0.89. LF has less cases than expected.
Cancer sites: There are large differences in the frequency of cancer according to the anatomical site of the cancer. The most common are breast for females and prostate for males, the most common for both genders are lung and colo-rectal cancer.

Cancer Site	Age group	Gender	Probability of developing cancer in Lifetime	
			In percent	In fraction
Breast		F	12.3	1 / 8
Colo-rectal		M,F	5.5	1 / 6
Lung		M	7.9	1 / 13
		F	6.2	1 / 16
Prostate		M	16.7	1 / 6

2.1. New cases: Incidence data

LTR is the main source of data for new cases. From 1998 to 2004 there were 239 cases of cancer in Livonia and Fordoche (LF) area and from 2005 to 2007 there were 64 cases. The annual case counts range from 5 to 25, such large random variations are expected in a small population. The average number of cases for the 17 years from 1988 to 2004 is 14.0, the median is 14.0.

Table 1: Cancer case numbers and rates in Livonia/Fordoche, Pointe Coupee and Louisiana

Year	Cases			Crude Rate			5Yr Avg CR			AARate			5Yr Avg AARate		
	For Liv	LF		LF	PC	La	LF	PC	La	LF	PC	La	LF	PC	La
1988	7	6	13	342.1	486.9	418.7	342.1	486.9	418.7	326.2	424.6	447.0	326.2	424.6	447.0
1989	4	3	7	185.7	397.5	416.6	263.9	442.2	417.7	229.7	309.2	444.8	278.0	366.9	445.9
1990	3	5	8	213.9	378.1	443.2	247.2	420.8	426.2	259.5	302.6	464.7	271.8	345.5	452.2
1991	5	9	14	377.4	417.8	459.1	279.8	420.1	434.4	454.0	335.9	482.0	317.4	343.1	459.6
1992	1	4	5	135.9	443.4	450.2	251.0	424.7	437.6	64.8	358.9	488.1	266.8	346.2	465.3
1993	6	12	18	493.2	500.3	448.4	281.2	427.4	443.5	462.1	385.8	482.3	294.0	338.5	472.4
1994	5	9	14	386.7	469.9	444.2	321.4	441.9	449.0	292.6	362.9	473.0	306.6	426.2	478.0
1995	6	7	13	362.1	481.7	456.7	351.0	462.6	451.7	364.0	384.8	482.8	327.5	430.7	481.6
1996	6	5	11	309.0	523.2	460.5	337.4	483.7	452.0	222.8	325.4	482.4	281.3	445.3	481.7
1997	10	15	25	708.2	531.4	479.7	451.8	501.3	457.9	637.8	408.6	494.5	395.9	448.5	483.0
1998	2	6	8	228.6	521.9	487.3	398.9	505.6	465.7	169.8	375.2	495.4	337.4	370.2	485.6
1999	7	8	15	432.3	508.6	487.9	408.0	513.4	474.4	388.5	357.0	490.4	356.6	348.5	489.1
2000	7	11	18	523.3	496.3	483.7	440.3	516.3	479.8	411.9	276.3	490.6	366.2	360.5	490.7
2001	5	9	14	410.6	521.6	502.6	460.6	516.0	488.2	360.8	385.2	497.1	393.8	363.4	493.6
2002	11	13	24	710.1	531.9	502.0	460.9	516.1	492.7	626.2	423.5	492.8	391.4	358.2	493.3
2003	2	12	14	417.9	488.8	500.6	498.8	509.5	495.4	309.3	348.9	483.8	419.3	368.4	587.2
2004	4	14	18	542.2	534.7	508.5	520.8	514.7	499.5	420.7	408.2	481.2	425.8	388.2	586.5
2005	8	12	20	602.4	514.2	496.3	536.6	518.3	502.0	500.7	375.0	487.1	443.5	399.8	601.2
2006	6	13	19	572.3	680.0	526.8	569.0	549.9	506.8	479.8	443.6	564.2	467.3	395.8	585.6
2007	10	8	18	542.2	582.1	535.8	535.4	560.0	513.6	436.4	403.1	418.7	429.4	326.0	487.0
9804	91	148	239												

5Yr Avg CR = 5 Year average crude rate. For the first 4 year the average rate is calculated as the average of the previous years, for example the average rate for 1990 is the average for years 1988, 1989 and 1990.
AARate = age adjusted rate
5Yr Avg AARate = 5 Year average age adjusted rate
LF = Livonia /Fordoche, PC = Pointe Coupee, La = Louisiana

The following figure shows crude rates by year for LF, Pointe Coupee and the Louisiana. Crude rates for LF clearly show wide variations from year to year. To display a better comparison between LF, Pointe Coupee and Louisiana, the following figure displays the 5 year moving average.

Figure 2: Cancer crude rates in Livonia/Fordoche, Pointe Coupee and Louisiana

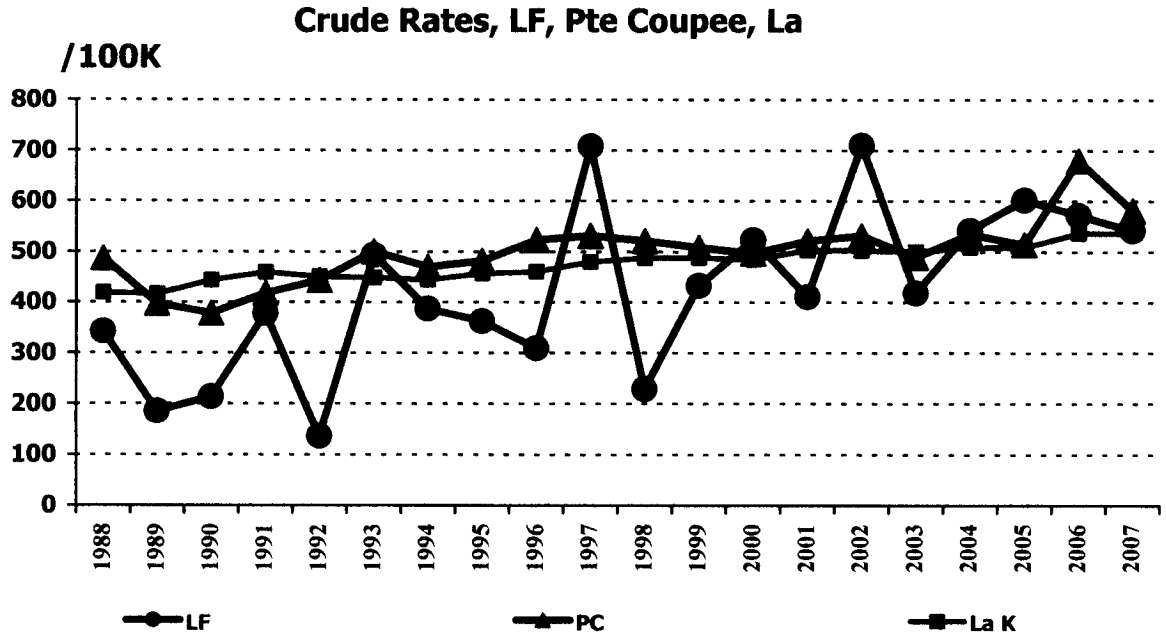
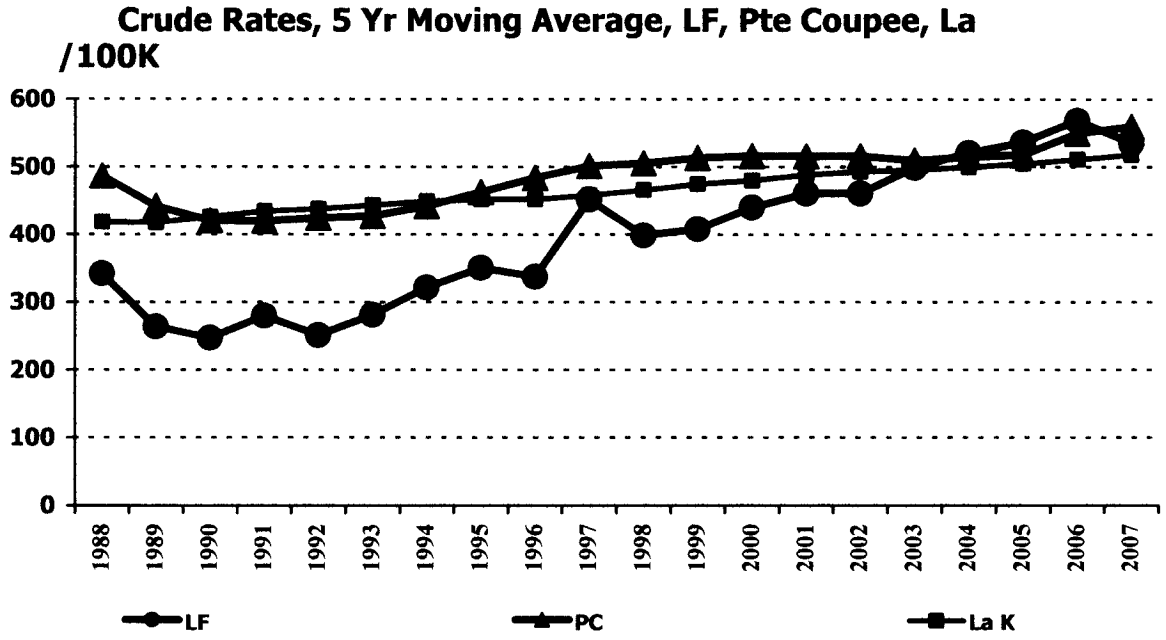


Figure 3: Cancer crude rates, 5 year moving average in Livonia/Fordoche, Pointe Coupee and Louisiana



The rates observed in LF are lower than those of Pointe Coupee or the State. The rates are increasing. They were much lower than the parish or the state, now the increase has brought the rate to the same level as the parish and the state.

Figure 4: Cancer age-adjusted rates in Livonia/Fordoche, Pointe Coupee and Louisiana

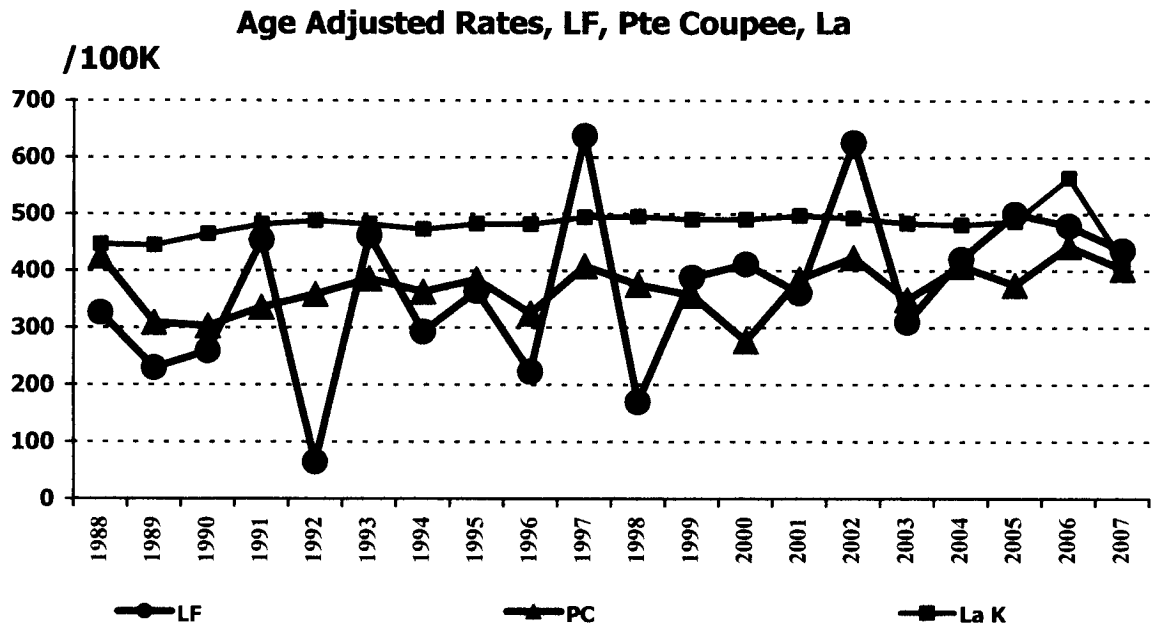
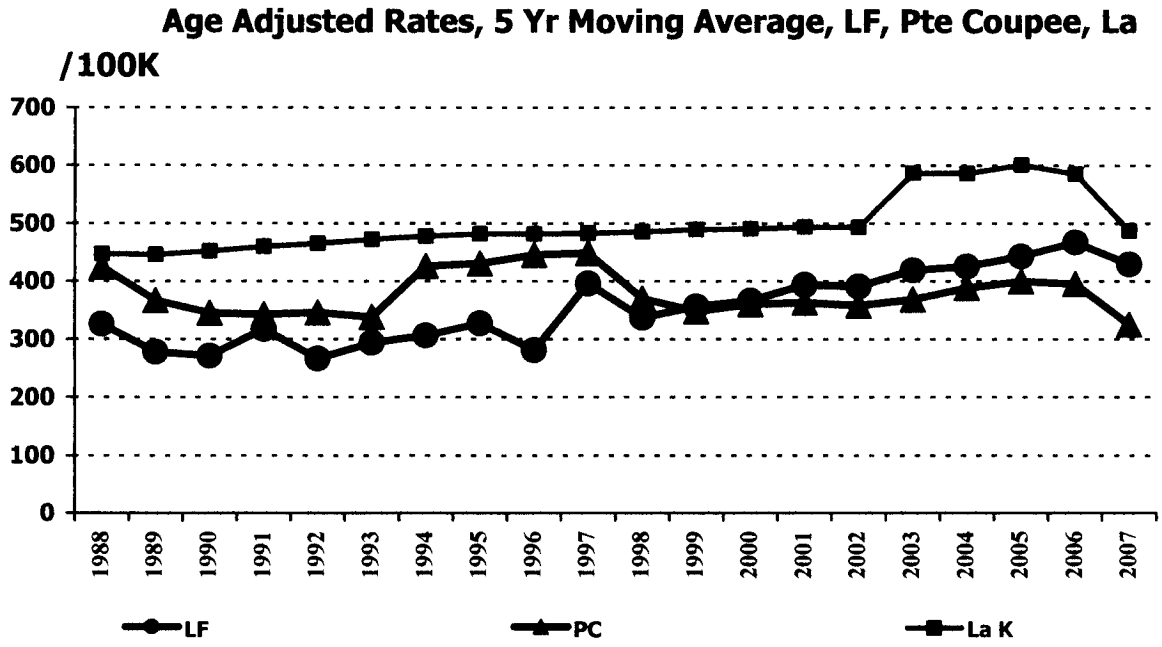


Figure 5: Cancer age adjusted rates, 5 year moving average in Livonia/Fordoche, Pointe Coupee and Louisiana



2.2. New cases: Age Adjusted Standardized Incidence Ratios

The Standardized Incidence Ratio (SIR) is the best method to compare rates and display the differences in small populations. For the period 1988-2004, the SIRs for males and females in Livonia / Fordoche and in Pointe Coupee showed rates lower than or close to 1, indicating that they were less than or close to 1, incidence in LF area is lower or comparable to incidence for Louisiana.

Table 2: Age adjusted Standard Incidence Ration (SIR) for the period 1988 to 2004 in Livonia/Fordoche and Pointe Coupee

Period	Population	Sites	Observed # cases	Expected # cases	SIR
1988-2004	LF Males	All cancers	134	151.0	0.88
1988-2004	LF Females	All cancers	105	106.8	0.98
1988-2004	Pte Coupee Males	All cancers	1,092	1,065.3	1.02
1988-2004	Pte Coupee Females	All cancers	854	849.0	1.00

The SIR were calculated separately for males and females for Livonia/Fordoche and Pointe Coupee as displayed in the following table:

Table 3: Yearly Age adjusted Standard Incidence Ration (SIR) by gender for the period 1988 to 2004 in Livonia/Fordoche and Pointe Coupee

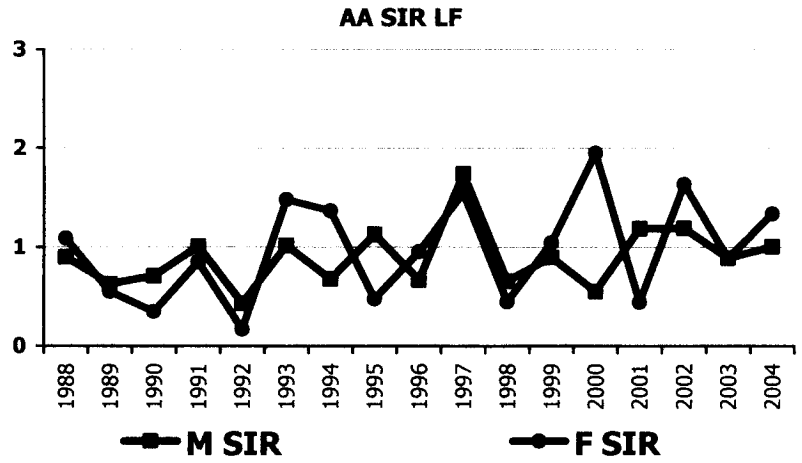
Year	LF		5Yr Avg LF		Pte Coupee	
	M	F	M	F	M	F
1988	0.90	1.09	0.90	0.43	1.16	1.19
1989	**0.63**	0.55	0.70	0.30	0.90	1.00
1990	0.71	**0.35**	0.77	0.34	0.85	0.82
1991	1.01	0.85	0.83	0.39	**0.76**	1.03
1992	**0.43**	**0.17**	0.75	0.34	0.97	0.84
1993	1.02	1.48	0.77	0.36	0.96	1.12
1994	0.68	1.37	0.81	0.39	0.97	1.03
1995	1.13	0.48	0.85	0.43	1.16	0.73
1996	0.67	0.95	0.76	0.37	1.07	1.08
1997	1.74	1.55	1.00	0.54	1.15	0.95
1998	0.66	**0.45**	0.91	0.48	1.15	0.87
1999	0.90	1.05	0.95	0.51	**0.77**	1.26
2000	0.55	**1.94**	0.84	0.43	**0.70**	0.83
2001	1.40	**0.44**	0.96	0.52	1.25	0.61
2002	1.41	1.63	0.92	0.48	1.09	0.85
2003	0.89	0.88	0.99	0.53	1.00	0.87
2004	1.01	1.33	1.01	0.54	1.14	0.89

The rates in bold mean that they are significantly higher or lower than the Louisiana comparison rate. Significant means that the differences observed are not likely due to random variations that may occur by chance alone.

2.2.1. AA-SIR Livonia and Fordoche

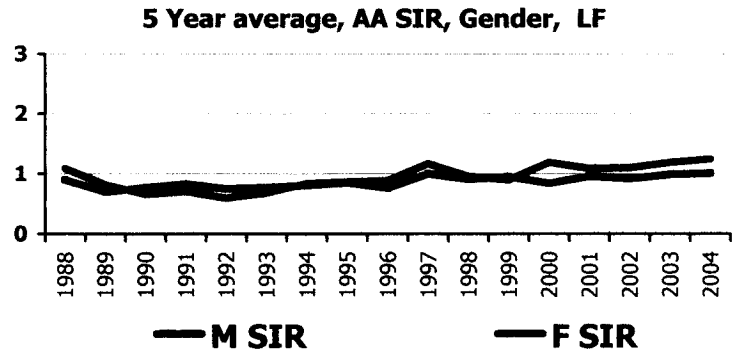
The AA-SIRs from the table above are presented in the figures below.

Figure 6: Age adjusted Standard Incidence Ratio (SIR) by gender, for the period 1988 to 2004 in Livonia/Fordoche



The 5 year average shows a much smoother line and makes it easier to compare. Both SIRs for males and females hover around 1, indicating that the incidence observed in LF are similar to that of Louisiana.

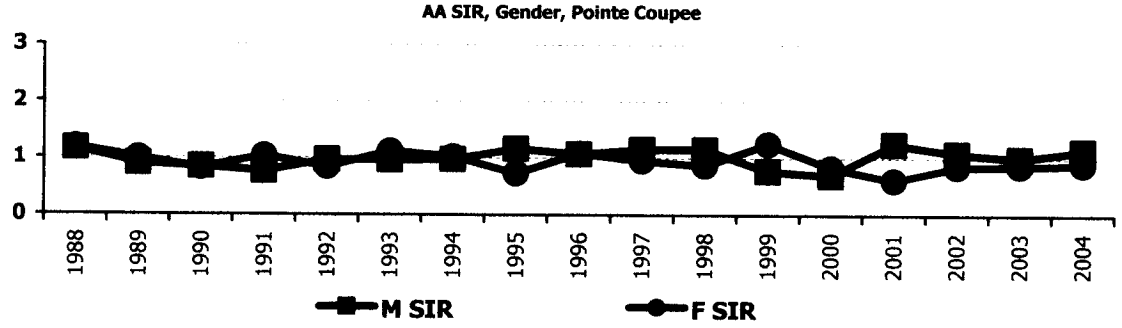
Figure 7: Age adjusted Standard Incidence Ration (SIR) by gender, 5 year moving average for the period 1988 to 2004 in Livonia/Fordoche



2.2.2. AA-SIR Pointe Coupee

The AA-SIRs are presented in the figures below.

Figure 8: Age adjusted Standard Incidence Ration (SIR) by gender, for the period 1988 to 2004 in Pointe Coupee



2.3. New cases: Site of cancer

A comparison was done for the four main cancer sites between LF, Pointe Coupee and Louisiana using the SIR. All SIR were close to 1. The SIRs below 0.90 were lung cancer for men in LF and women in Pointe Coupee, and urinary tract cancers in women in LF. Those higher than 1.10 were colo-rectal cancer in women in LF and urinary tract infection, leukemia /lymphomas in men in LF. There was no consistent pattern of higher rates in any of the common sites.

Table 4: Standard Incidence Ratio (SIR) by gender and cancer site, for the period 1988 to 2004 in Livonia/Fordoche and Pointe Coupee

	Livonia /Fordoche		Pointe Coupee	
SITE	**M SIR**	**F SIR**	**M SIR**	**F SIR**
Breast	NA	0.96	NA	0.93
Prostate	0.99	NA	1.01	NA
Lung	0.68	0.96	0.94	0.74
Colorectal	1.01	1.16	1.08	1.07
Urinary Tract	1.22	0.78	0.95	0.99
Blood(leukemias and lymphomas)	1.18	0.69	1.05	0.83

2.4. New Cases / Incidence: Pointe Coupee National Cancer Institute (NCI) Data

These data were provided to NCI by the National Vital Statistics System and represent the years 2000 to 2004. The incidence rates are new cases / 100,000. The data are accessible at http://statecancerprofiles.cancer.gov . These rates are all age-adjusted.

The incidences of all cancer sites for both genders, all sites for females, breast, lung, colorectal, bladder, kidney and urinary pelvis and non-Hodgkin lymphoma were all slightly lower than the state. The only rates higher than the state average were prostate and all cancer sites for men.

Table 5: NCI Incidence Data, 2000-2004 for the USA, Louisiana and Pointe Coupee

Rate / Site	Gender	USA	LA	PC
Allsites	MF	473.6	489.0	468.5
Allsites	M	559.9	615.7	**640.6**
Allsites	F	414.1	402.4	336.8
Breast	F	123.9	122.0	114.4
Prostate	M	159.0	179.7	**191.7**
Lung	MF	68.9	80.3	78.6
Colorectal	MF	52.2	58.4	57.2
Bladder	MF	21.6	19.4	16.7
Kidney/Upelvis	MF	13.7	16.1	13.5
NHLymphoma	MF	---	18.9	17.9

2.5. Mortality

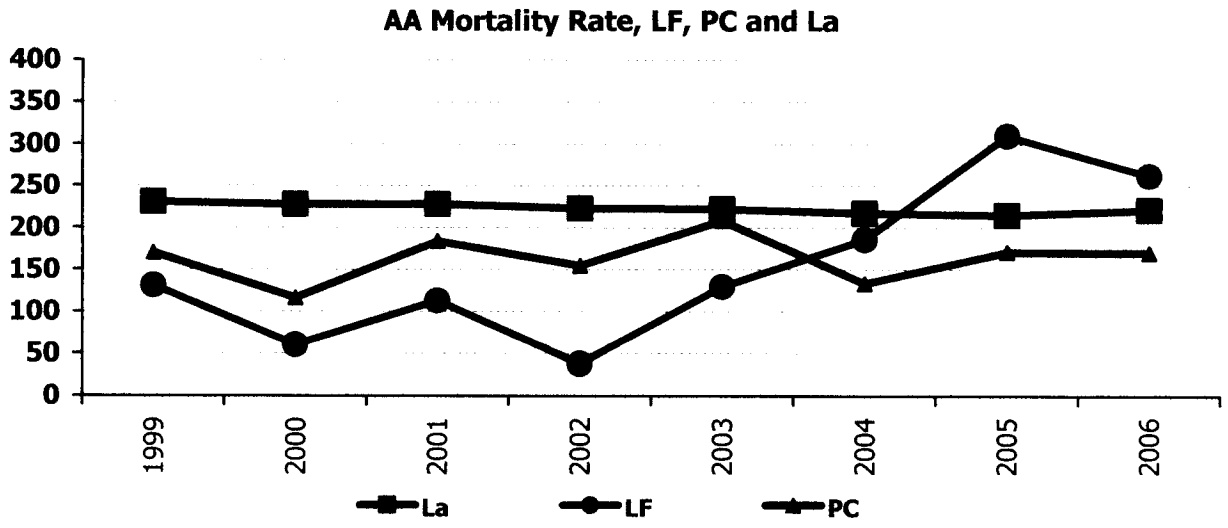
2.5.1. Mortality Data from Louisiana Vital Statistics

The following table and figure show the Livonia/Fordoche, Pointe Coupee and Louisiana mortality age adjusted rate (La AA Rate, age adjusted on US population 2000). It appears that the AA mortality rate has been increasing in recent years. An increase in mortality while incidence remains stable may be indicative of diagnoses of cancer at later stages.

Table 6: LF, PC and Louisiana Mortality Rates /100,000 for the period 1999-2005

Year	Louisiana	Pointe Coupee (PC)	Livonia / Fordoche
1999	230.6	169.75	131.1
2000	227.3	116.14	60.1
2001	227.9	183.39	112.6
2002	223.0	154.38	38.0
2003	222.2	208.05	129.3
2004	217.3	133.33	185.5
2005	214.9	170.62	310.5
2006	221.5	169.75	262.7

Figure 9: LF, PC and Louisiana Mortality Rates /100,000 for the period 1999-2005

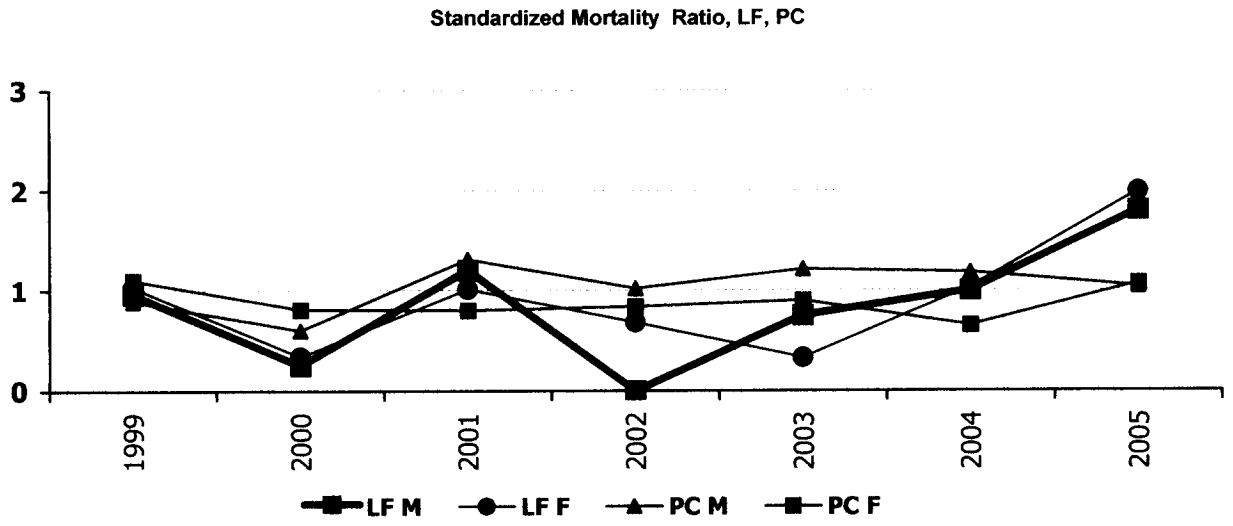


The following table shows the number of deaths by gender (M # and F #) and the Standardized Mortality Ratio for males and females for the years 1999 to 2005. The Standardized Mortality Ratio (SMR) is the ratio of the number of deaths observed in the LF population to the number that would be expected if the LF population had the same specific rates as the Louisiana population. A SMR of 1.0 means that LF has a similar rate as Louisiana. A SMR greater than 1.0 means that LF has a higher rate and a SMR lower than 1 means that LF has a lower rate than the state. The majority of SMR are lower than 1.0 and because of the small population they vary a lot from year to year. The SMR are statistically significantly lower for the following categories: 2000 Males, 2002 Males, 2003 Males, 2002 Females.

Table 7: Standardized Mortality Ratios by Gender for Pointe Coupee and Livonia / Fordoche

	Pointe Coupee					Livonia / Fordoche			
Year	M #	M SMR	F #	F SMR		M #	M SMR	F #	F SMR
1999	28	0.89	27	1.10		4	0.96	3	1.03
2000	23	0.60	25	0.81		1	**0.25**	1	0.34
2001	41	1.31	20	0.80		5	1.20	3	1.01
2002	31	1.02	21	0.84		0	**0.00**	**2**	**0.68**
2003	37	1.21	23	0.90		3	**0.75**	1	0.33
2004	36	1.18	16	0.65		4	1.00	3	1.03
2005	31	1.04	27	1.07		7	1.80	6	1.99

Figure 10: Standardized Mortality Ratios by Gender for Pointe Coupee and Livonia / Fordoche



2.5.2. National Cancer Institute Data

The data are provided to NCI by the National Vital Statistics System. These data represent the years 2001 to 2005. The mortality rates are deaths / 100,000 for all sites, all races and all genders. The data are accessible at http://statecancerprofiles.cancer.gov . These rates all age-adjusted.

The mortality rates were in Pointe Coupee (232), in Louisiana (221) and in the US (190) for the period 2001-2005.

2.6. Hospital discharge data

In Louisiana the proportion of hospitalizations which have cancer as a primary discharge diagnosis is about 28 /1,000 ranging from 26 to 30 /1,000 over the study period 1999-2005. In Pointe Coupee this proportion is 32/1,000, ranging from 24 to 44/1,000, in Livonia /Fordoche the average is 37/1,000, ranging from 21 to 52/1,000. As expected in the smaller the population and the higher the variability in the proportion.

Table 8: Hospitalization rate for Cancer as a primary discharge diagnosis / 1,000 hospitalizations

	Louisiana			PC			LF		
	All Hosp	Cancer	Ca /1,000H	All Hosp	Cancer	Ca /1,000H	All Hosp	Cancer	Ca /1,000H
1999	468,000	14,000	29.9	2,582	64	24.8	242	8	33.1
2000	491,000	14,400	29.3	1,368	33	24.1	206	5	24.3
2001	548,000	15,500	28.3	2,946	90	30.5	236	5	21.2
2002	563,000	15,800	28.1	2,218	68	30.7	173	4	23.1
2003	528,000	14,700	27.8	1,565	64	40.9	199	9	45.2
2004	609,000	16,100	26.4	3,142	101	32.1	477	21	44.0
2005	549,000	14,100	25.7	2,314	103	44.5	347	18	51.9
Sum	3,756,000	104,600	27.8	16,135	523	32.4	1,880	70	37.2

Cancer ICD9 >139 and <209
L&F Zip = 70755 or 70732; Pointe Coupee;

2.7. Existing cases (Prevalence)

Cancer prevalence is the number of people alive today who have been diagnosed with cancer. In 2004 the number of people newly diagnosed with cancer in the US was 1,300,000 and the number of people living with cancer was estimated at 10,800,000, a ratio of 8.3 people living with cancer for 1 newly diagnosed case (http://seer.cancer.gov/csr/1975-2004/ and http://cancercontrol.cancer.gov/ocs/prevalence.html.

Using a similar method, the number of new cancers in the Fordoche/Livonia area was 15 new cases in 2004, so it is estimated that about 15*8.3 = 125 persons are living with cancer. In the Fordoche/Livonia areas there are 843 households, so there is 1 person living with cancer in every 7 households. Adding recent death from cancer, we could add about 30 recent deaths (last 4 years) for a total of 155 cancer (alive and recent deaths). That would represent 1 person / 6 households.

In the US, there are 10,000,000 persons living with cancer, 500,000 deaths per year and 100,000,000 households. Therefore the number of persons living with cancer and four years of death comes to 12,000,000 persons, that would represent one person per 8 households.

Two random streets were selected in Metairie to verify these calculations. All cases of cancer that occurred in a 10 year period (1995-2004) were counted:
Street R: 76 houses, 15 cases = 1 case / 5 houses
Street S: 146 houses, 24 cases = 1 case / 6 houses

2.8. Recent cases

At the town hall meeting held on June 25, 2008 questions were raised about the more recent cancer cases those from the past year that were not yet counted in the LTR. People were asked to provide information to the SEET on these "new cancer cases". Eight people provided authorization for release of medical records: three breast cancer, one cervical cancer, one hodgkin's lymphoma and three undetermined (medical records could not be obtained). In summary this attempt to identify new cases did not yield a large number of cases, the result was well within what would be expected.

3. Environmental concerns

3.1. Cancers due to pollutants in the environment

At the town hall meeting held on June 25, 2008 questions were raised about the environment. A common public perception is that pollutants in the environment account for a major proportion of cancer. The causes of cancer and their contribution to the distribution of cancer was estimated by the American Cancer Society as the following:

Hereditary factors	**25%**	
Non hereditary factors or acquired factors	**75%**	
Poor nutrition / Inactivity / Obesity		35%
Tobacco use		30%
Infectious agents		2%
Medical treatment		2%
Occupational exposure		4%
Environmental pollutants (man-made and naturally occurring)		2%

From American Cancer Society, 2008. Cancer Facts & Figures; Environmental cancer risks, page 56.
Two major classes of factors influence the incidence of cancer: hereditary factors and acquired (environmental) factors. Hereditary factors come from our parents and cannot be modified. Environmental factors are potentially modifiable. They include tobacco use, poor nutrition, inactivity, obesity, certain infectious agents, certain medical treatments, sunlight, cancer-causing agents that occur naturally in food, cancer-causing agents in the workplace, and cancer-causing agents that exist as pollutants in our air, water, and soil. Environmental (as opposed to hereditary) factors account for an estimated 75%-80% of cancer cases and deaths in the US. Exposure to carcinogenic agents in occupational, community, and other settings is thought to account for a relatively small percentage of cancer deaths, about 4% from occupational exposures and 2% from environmental pollutants (man-made and naturally occurring). Although the estimated percentage of cancers related to occupational and environmental carcinogens is small compared to the cancer burden from tobacco smoking (30%) and the combination of nutrition, physical activity, and obesity (35%), the relationship between such agents and cancer is important.

Pollutant carcinogens in the environment at high levels that can cause cancer in people and, usually result in high incidence of a specific type of cancer: for example asbestos pollution results in high levels of mesothelioma among those exposed. From the review of cancer statistics, numbers, rates, distribution by sites, there is no indication that there would be any major environmental conditions leading to cancer in this population. The distribution pattern of cancers in LF does not show any abnormalities from the expected distribution of cancers by site.

Although there appears to be no links from environmental pollutants to high rates of cancer, it is important to address these concerns.

3.2. Drinking water

The Department of Health and Hospitals – Office of Public Health (DHH/OPH) Center for Environmental Health Services and DHH/OPH District 2/Region 2 Office reviewed the sample records for the following public water systems (PWS):

- Village of Fordoche PWS ID 1077009
- Town of Livonia PWS ID 1077022
- Pointe Coupee Waterworks District #2 – Hwy 10 PWS ID 1077047
- Torbert Frisco Waterworks PWS ID 1077037

Attached is an Excel spreadsheet which includes the wells sampled, sample collection dates, and analyte classifications.

The samples were reviewed for compliance with the National Primary Drinking Water Regulations (NPDWR). These sample sets are typically collected at each well head every three (3) years. A list of the contaminants included in the NPDWR and their respective Maximum Contaminant Levels (MCL) are available at http://www.epa.gov/safewater/contaminants/index.html#listmcl.

MCL is defined as "the highest level of a contaminant that is allowed in drinking water." **No Primary Drinking Water Contaminant Levels at or above their respective MCL were discovered during this office's review.**

Public Water Systems are required to use disinfectants (such as Chlorine) to kill disease-causing microorganism in drinking water. Disinfectants react with natural organic matter (NOM) found in water, creating by-products such as Trihalomethanes (THMs) and Haloacetic acids (HAAs). Disinfection by-products (DBPs) have been shown to cause cancer and adverse reproductive or developmental effects. Therefore, THMs and HAAs are regulated with MCLs of 80 ug/L for THMs and 60 ug/L for HAAs. The above systems are required to monitor for THMs-HAAs in their distribution system every three years. The table below contains the above systems' DBP data:

Systems	Sample Dates	THMs (ug/L)	HAAs (ug/L)
Maximum Contaminant Allowed (MCL)		**80**	**60**
Village of Fordoche	8/30/04	6	4
	5/6/08	5	0
Town of Livonia	8/23/04	2	2
	9/21/07	5	2
Pointe Coupee Waterworks District #2	9/21/04	42	20
	8/14/07	1	0
Torbert Frisco Waterworks	9/21/04	6.1	1
	7/16/07	0	0

Each month, two (2) samples are collected from the water distribution systems of each of these water systems and analyzed for the presence of total coliforms. If a routine or repeat sample result is positive for total coliform, the sample is also analyzed for fecal coliform or *E. coli*, which is a potential indicator of sewage contamination. No fecal positive sample results were discovered during this office's review (back to 2001) of coliform samples for these four (4) public water systems. Furthermore, it does not appear that this office has received any complaints or concerns of wastewater/sewer contamination in these public water systems. The water from these water systems is safe to drink and use for all household purposes.

On the question regarding the presence of antibiotics in the drinking water: Trace antibiotics are a concern in water at or near the surface. The water used in this area is all ground water of ancient age that far predates human existence on earth. There is no concern that any human-produced products are in the drinking water.

3.3. Contaminants regulated by LDEQ

A review of records pertaining to the area around the communities of Livonia and Fordoche in Pointe Coupee Parish has been undertaken by LDEQ. A total of 62 sites are known to LDEQ through assigned Agency Interest (AI) numbers. These sites are:

24- Oil and Gas Facilities
4- Landfill Sites
2- Oilfield Service Companies
2- Truck Stops
1- Concrete Plant
1- Union Pacific Rail Terminal
Current Underground Storage Tank (UST) Sites

In addition, LDEQ maintains the following databases:

- Air analysis site near Grosse Tete testing ambient air for ozone and nitrogen oxides in operation since 1993
- Ongoing surface water quality monitoring program for bayous Fordoche and Grosse Tete since 2000
- Reports, permits, plans, and correspondence related to various business activities dating to 1981

3.3.1.Historical Records

1. Sanborn Maps

The Louisiana State Library holds historical Sanborn maps covering a time span from 1885 to 1950. A Sanborn map of the Fordoche area dating from 1919 was located, but contained no remarkable information (Attachment 1). Since Livonia was not incorporated until 1959, no maps were found.

2. Air Quality Data

The LDEQ has operated a continuous air monitoring site near Grosse Tete since 1993. This facility tests ambient air for the presence of ozone and oxides of nitrogen. This facility has recorded ozone levels above ambient air quality standards. These events could usually be attributed to local activities such as farming operations. While such events are recorded in the database used to study the regional ozone issue, no prolonged periods of high ozone levels or predictable patterns have been observed.

3. Water Quality Data

Surface water quality in the Bayou Fordoche and Bayou Grosse Tete area has been monitored since 2002 by LDEQ (Attachment 2). Tests include dissolved oxygen content, heavy metals, and trace organic chemicals. To date, no evidence is found which indicates environmental contamination of these water bodies. One exception is found in the occasional low dissolved oxygen results which are typical of low-flow streams receiving agricultural runoff.

4. Union Pacific Rail Yard

Records from February 2000 to present indicate there were 18 non- emergency incidents and inspections, 3 emergency response notifications, and 1 remediation project involving this facility. The emergency and non- emergency events were typically low volume spills and subsequent cleanup activities associated with normal operations. Enforcement actions taken for noncompliance included a total of 4 citations for exceeding wastewater limits on fecal coliform count and biochemical oxygen demand (BOD). The available data indicates that no releases presented a threat to human health or the environment. In addition there is no evidence that site-related releases have migrated offsite in environmental media.

5. General Historic Landuse

Agriculture and petroleum exploration and production are two industries that have historically been associated with the area. LDEQ maintains no records of agricultural activity, but does monitor certain cleanup activities related to oil and gas operations in co-operation with the Department of Natural Resources. LDEQ has record of a site located several miles West of Livonia on U.S. Highway 190. The "Texaco Brine Pits" area contains soil and groundwater contamination. This site was the subject of a remediation project designed to remove salt contamination from the soil and groundwater. Site-related releases were contained on site and addressed with remedial actions which ended in 1997. There was no migration of contaminants off-site or to any residential area. It is believed that this area is not connected to the Livonia/ Fordoche subsurface environment.

6. LeBeau Road Dumpsite

This former disposal site is located approximately 3 miles South- Southeast of Glaser Street. Groundwater flow in this area is toward the Southeast. Thus, it is highly unlikely that potential contaminants from the LeBeau Road site might impact the Glaser Street area. Review of current and historical data on the quality of ambient air and surface water in the Livonia/ Fordoche area of Point Coupee Parish shows results well within expected and acceptable levels.

Attachment 1 Sanborn Map of Fordoche Area ca. 1919