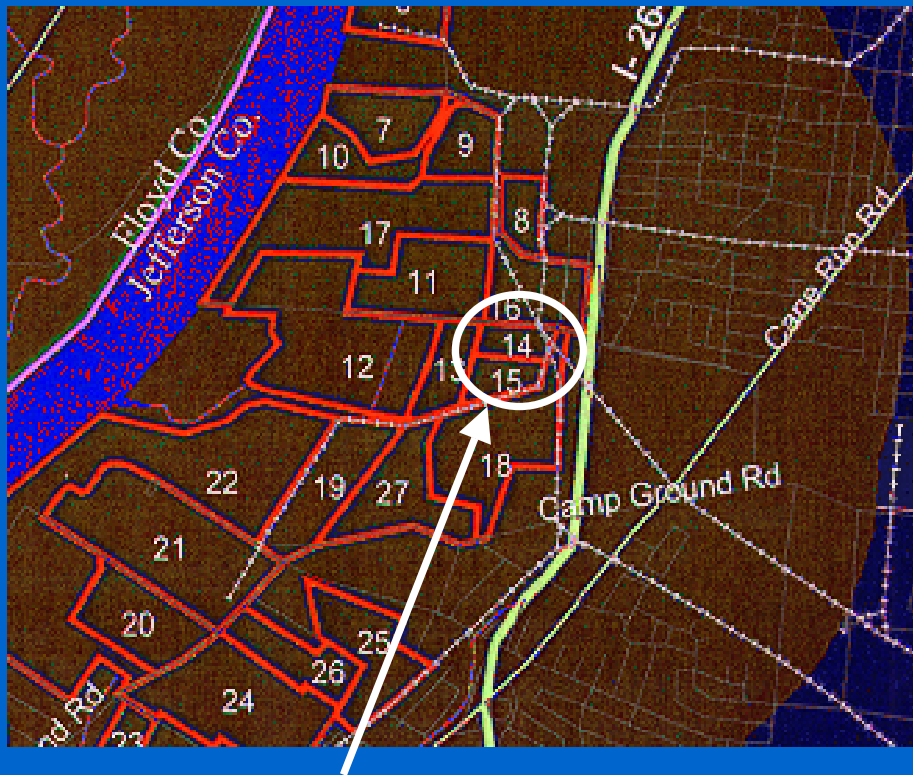


Introduction

- In 1974, the unusual occurrence of three cases of a rare cancer, hepatic angiosarcoma was discovered in workers at a polymer manufacturing facility in the Rubbertown complex in Louisville.

“Rubbertown” Production Complex



BF Goodrich Complex

- Plastics and synthetic rubber production began in the 1940's
- BF Goodrich: Vinyl chloride (VC) and Polyvinyl chloride (PVC)
- Adjacent Government plant produced Nitrile Rubber (NBR)
- Acquired in 1950 to form complex

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Overview of Health Surveillance Program

- **Through a grant from the National Cancer Institute, the University of Louisville established the Division of Occupational Toxicology to conduct ongoing occupational surveillance and epidemiological research of facility workers.**
- **Surveillance Program started by Carlo Tamburro MD**
- **BFG, Zeon, Sud Chemie, Geon, PolyOne, Oxyvinyl and Noveon.**

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Databases

- Epidemiological
- Medical Surveillance
- Biological Specimens

Epidemiological Database

- 5,600 individual work histories
- exposure estimates for 35 chemicals beginning in 1942 through 2002
- mortality statistics
 - morbidity and mortality information from death certificates and medical records
- regional, state, and national comparison rates

Medical Surveillance

•6000 Active and Inactive Employees in ongoing annual screening

studies obtained on selected employees

- **Medical Histories**
- **Blood tests**
- **Physicals**
- **Pulmonary Function Tests**
- **EKG**
- **Vision**
- **Audiometric Exams**
- **Audiometric Histories**
- **Liver biopsies**
- **Heart catheterizations**
- **Spleen scans**

Biological Specimen Bank

- 3,500 specimens from 1975-1981
- 3,000 specimens from 1990-present
- 200 liver biopsies

Goals

- To Determine Employee Health Status
- To Detect and Prevent Disease
- To Ensure Safety of Environment of Surrounding Communities
- To Provide Scientific Reassurance of Healthy Work Environment

Solutions and Opportunities

- Cardiovascular disease risk in workers exposed to butadiene, methanol and phenol.
- Genetic and metabolic factors that contribute to environmental-induced disease.
- Assessment of lung function
- Effects of occupational exposure on male reproduction
- Case control studies for excesses in cancer
- Development of Biomarkers

Past Findings

- **Assessment of health risks to current workers**
- **Long term effects of exposures**
- **Effects on Residential Community**

Cancer Mortality

2,375 plastic and rubber workers

	U S			K Y		J C	
	Obs	Exp	SMR	Exp	SMR	Exp	SMR
All causes	897	835.8	107	959.3	94	965.9	93
All cancers	252	205.0	123	232.2	108	255.8	99
Gastrointestinal	69	50.5	136	50.3	137	58.0	119
Liver	25	4.7	534	5.6	450	6.1	408
Esophagus	8	6.3	127	5.0	162	7.5	107
Stomach	6	8.0	75	6.5	92	6.2	97
Colorectal	19	22.4	85	21.8	87	26.1	73
Pancreas	9	10.6	85	10.5	85	11.2	80
Respiratory System	102	81.0	126	107.5	95	117.2	87
Lung	94	75.9	124	98.9	95	105.1	89
Genitourinary	23	26.1	88	25.6	90	27.9	82
Kidney	7	5.2	136	5.5	127	5.6	125
Bladder	5	5.0	100	5.0	100	6.3	79
Prostate	11	16.5	67	14.2	78	15.1	73
Brain and nervous system	14	5.8	240	6.4	219	6.8	206
Hematologic and Lymph	21	19.6	107	19.5	107	20.4	103

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Liver Cancer and Vinyl Chloride Exposure Stratification

Liver Cancers v. Kentucky Rates

	Observed	Expected	SMR
VC High	22	2.11	1037*
VC Medium	3	1.89	158
VC Low	0	1.55	0

Brain Cancer and Vinyl Chloride Exposure Stratification

Brain Cancers v. Kentucky Rates

	Observed	Expected	SMR
VC High	5	2.37	210
VC Medium	4	2.23	179
VC Low	5	1.77	181

Past Conclusions

- Excess of cancer due to hepatic angiosarcoma and brain cancer
- Excess of lung cancer compared to US but not State or County rates
- Strong correlation between VC exposure and liver cancer
- No relationship between VC exposure and brain cancer

Active Projects

- Evaluation of p53 Biomarker with NIH
- Evaluation of Hyaluronic Acid as Biomarker
- Nutrition and Obesity among workers
- Pulmonary function assessment

Future Projects

- Updated Mortality Study
- Evaluation of markers of sinusoidal injury
- Study of brain cancers due to chemicals other than VC

Conclusion

- The U of L Occupational Health Surveillance Program currently maintains one of the largest and most complete occupational research data banks in the world.