Indiana Cancer Facts & Figures 2003

A sourcebook for planning and implementing programs for cancer prevention and control

American Cancer Society®

Indiana State Department of Health

Indiana Cancer Consortium

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Acknowledgements

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Dear Reader,

The Indiana Cancer Consortium (ICC) welcomes you to the first-ever publication of *Indiana Cancer Facts and Figures*—a benchmark report on the status of cancer in Indiana.

Born from a vision of the American Cancer Society, Great Lakes Division, the Indiana State Department of Health, and the Indiana University Cancer Center, the ICC was launched in October 2001 with the coming together of key stakeholders united in the common mission of reducing the burden of cancer in Indiana. Today, 62 participating organizations are involved representing all aspects of the cancer continuum, from prevention, early detection and treatment, to survivorship and end of life care.

Indiana Cancer Facts and Figures represents an important first-step in ICC's development of a comprehensive cancer control plan for Indiana. Prior to this report, no up-to-date information was available to document how the disease is affecting the people of Indiana today. Nor has there been an integrated system to accurately identify current cancer trends and their projected impact on our future. It was a task that no one organization could accomplish alone.

The collaboration that defines both ICC and the inaugural *Indiana Cancer Facts and Figures* is an exemplary application of public health practice. The sharing of knowledge, resources and expertise among the many participating organizations is truly a landmark achievement that will have lasting impact.

To all individuals and organizations who have made a commitment to the ICC we thank you for your participation. To those who have an interest in our mission and have not yet joined us, we invite you to get involved in the war on cancer. And, to the 6.1 million people who live and work in Indiana, we promise to step up the fight with the delivery of a comprehensive statewide cancer plan that will improve the health of Hoosiers for decades to come.

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Common Questions About Cancer

What is cancer?

Cancer is a group of diseases characterized by uncontrolled growth and spread of abnormal cells. The cancer cells form tumors that destroy normal tissue. If cancer cells break away from a tumor, they can travel through the blood stream or the lymph system to other areas of the body, where they may form new tumors (metastases). If this growth is not controlled, cancer may be fatal.

Are all growths and tumors cancerous?

Not all irregular growths of abnormal cells lead to cancer. A tumor can be either benign (non-cancerous) or malignant (cancerous). Benign tumors do not metastasize and, with very rare exceptions, are not life threatening. Benign tumors usually grow slowly, remain localized, and do not destroy surrounding normal tissue.

What causes cancer?

Cancer is caused by both external factors (tobacco, diet, alcohol, chemicals, sunlight, radiation, and infectious organisms) and internal factors (inherited mutations, hormones, immune conditions, and mutations that occur from metabolism). They may act together or in sequence to initiate or promote carcinogenesis. Ten or more years often pass between exposures or mutations and detectable cancer.

All cancers involve the damage or mutation of genes that control cell growth and division. About 5% to 10% of cancers are hereditary and caused by an inherited mutated gene that predisposes a person to a very high risk of certain cancers. Other cancers result from gene mutations caused by exposure to either internal or external factors.

Who gets cancer?

Anyone can get cancer at any age. However, middle and old age people are more likely to develop cancer. Statewide and nationally, about 77% of all cancers are diagnosed in people 55 or older.

Also, individuals who have been exposed to certain external and internal risk factors have an increased relative risk or chance of developing cancer. For example, male smokers have a 20-fold relative risk of developing lung cancer compared with nonsmokers. This means that they are about 20 times more likely to develop lung cancer than nonsmokers. Most relative risks are not this large. For example, women who have a first-degree (mother, sister, or daughter) family history of breast cancer have about a 2-fold increased risk of developing breast cancer compared with women who do not have a family history.

How is cancer staged?

Staging is the process of describing the extent or spread of the disease from the site of origin. A cancer's stage is based on the primary tumor's size and location in the body and whether it has spread to other areas of the body. A number of different staging systems are used to classify tumors.

The ***TNM staging system*** assesses tumors in three ways: extent of the primary tumor (T), absence or presence of regional lymph node involvement (N), and absence or presence of distant metastases (M). Once the T, N, and M are determined, a "stage" of I, II, III, or IV is assigned, with stage I being early stage and IV being advanced.

Summary staging is useful for descriptive and statistical analysis of tumor registry data. An **in situ** tumor is at the earliest stage when it has not invaded surrounding tissue; it can only be diagnosed by microscopic examination. A **localized** tumor has not spread beyond the primary organ. A **regional** tumor has spread beyond the primary organ to surrounding organs, tissues, or lymph nodes. A **distant** tumor has spread to other parts of the body, or metastasized, either through the blood or lymph node systems. With an **unstaged/unknown** tumor, there is insufficient information available to determine the stage of the disease.

How is cancer treated?

Treatment depends on the cancer, specific diagnosis, and the type and stage of growth. Cancer is treated by one or more of the following therapies:

- **Surgery** removes the tumor by cutting the cancerous mass; it is mostly used for localized tumors.
- **Chemotherapy** uses either intravenous or oral drugs to destroy cancer cells. It is used with the intention of curing or inducing remission in poorly differentiated carcinoma.
- **Hormone therapy** may be given to block the body's natural hormones and to slow or stop the growth of certain cancers.
- **Immunotherapy or biologic therapy** is used to stimulate and strengthen one's own immune system to destroy the cancer cells.
- **Radiation or radiotherapy** uses high-energy rays to destroy or slow the growth of cancer cells. It can be used with the intention of curing some cancers that have not spread too far from their site of origin, or to relieve symptoms.

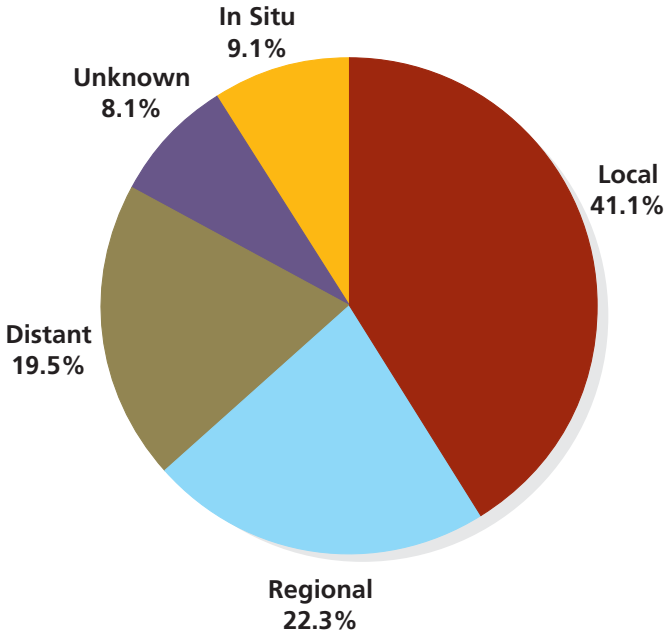
Can cancer be cured?

Many cancers can be cured if detected and promptly treated. For most types of cancer, if a person's cancer has been in remission (all signs and symptoms of the disease are absent) for 5 years, the cancer is considered cured. However, the length of remission at which a person is considered cured differs by cancer type. Certain skin cancers are considered cured as soon as the lesion is removed. With other cancers, 8 to 10 years must pass before the person is considered to be cured.

What is the impact of stage at diagnosis on survival?

Staging is essential in determining the choice of therapy and assessing prognosis. It is a strong predictor of survival; generally, the earlier the stage, the better the prognosis. Locally and nationally, about half of newly diagnosed cases are either in situ or localized (Figure 1).

Figure 1. Average Stage at Diagnosis in Indiana, All Cancers, 1996-2000



Source: Cancer Incidence and Mortality: Preliminary State Data 1996-2000. May 2003.

Can cancer be prevented?

Many cancers can be prevented by modifying external factors and lifestyle changes, such as eliminating tobacco use, improving dietary habits, losing weight, obtaining early detection cancer screenings and avoiding sun and infectious exposures.

- All cancers caused by use of tobacco products could be prevented. ***The Harvard Report on Cancer Prevention*** estimates that 30% of cancer deaths are caused by tobacco use. In 2003, an estimated 3,900 Hoosier lives will be lost to cancer due to tobacco use.
- Scientific evidence also suggests that it may be possible to reduce cancer deaths by about one-third by improving nutrition and maintaining a recommended body weight. In particular, diets low in animal fat and high in fruits and vegetables could help prevent certain cancers.
- Early diagnosis through regular screening examinations saves lives by identifying cancers when they are most curable and treatment is more successful. Cancers that can be detected by screening account for about half of all new cancer cases and include breast, colon, rectum, cervix, prostate, testis, oral cavity, and skin. The 5-year relative survival rate for these cancers is about 82% but would increase to about 95% if all of these cancers were diagnosed at a localized stage through regular cancer screenings.

- The more than 1 million skin cancers that are expected to be diagnosed in the U.S. in 2003 could have been prevented by protection from the sun's rays.
- About 5% of cancers are related to infectious exposures, such as hepatitis B virus (HBV), human papillomavirus (HPV), human immunodeficiency virus (HIV), helicobacter, and others, and could be prevented through behavioral changes, vaccines, or antibiotics.

Table 1. Causes Of Cancer In The U.S.

Cause	Percent Rate
Tobacco	30
Adult diet/obesity	30
Sedentary lifestyle	5
Occupational factors	5
Family history of cancer	5
Viruses/other biologic agents	5
Perinatal factors/growth	5
Reproductive factors	3
Alcohol	3
Socioeconomic status	3
Environmental pollution	2
Ionizing/ultraviolet radiation	2
Prescription drugs/medical procedures	1
Salt/other food additives/contaminants	1

Source: Harvard Report on Cancer Prevention, (1996). Harvard Center for Cancer Prevention, Harvard School of Public Health.

What are the most common cancers?

The most common cancers for both the state and the nation are the same. Breast and prostate are the most prevalent cancers in women and men, respectively. Lung, bronchus and colon cancers are the next most common cancers in both sexes (Table 2).

Table 2. Cancer Incidence In Indiana, 2000

Site	New Cases
Lung and Bronchus	4,481
Female Breast	4,045
Prostate	3,482
Colon	3,321
All Sites	**27,071**

Source: Indiana State Department of Health - Indiana State Cancer Registry.

How many people alive today will get cancer?

About 2.5 million or 2 in 5 Hoosiers now living will eventually develop cancer. Nationally, men have slightly less than a 1 in 2 chance of developing cancer in their lifetime; women's lifetime risk of developing cancer is slightly more than 1 in 3.

How many people alive today have ever had cancer?

The National Cancer Institute estimates that approximately 8.9 million Americans with a history of cancer were alive in January 1999. Some of these individuals were cancer-free, while others still had evidence of cancer and may have been undergoing treatment.

How many new cases of cancer are expected to occur this year?

The American Cancer Society estimates that approximately 31,200 Indiana residents will be diagnosed with cancer in 2003. This amounts to almost four new cases of cancer diagnosed every hour of every day. This estimate does not include non-melanoma skin cancer and carcinoma in situ (for sites other than urinary bladder).

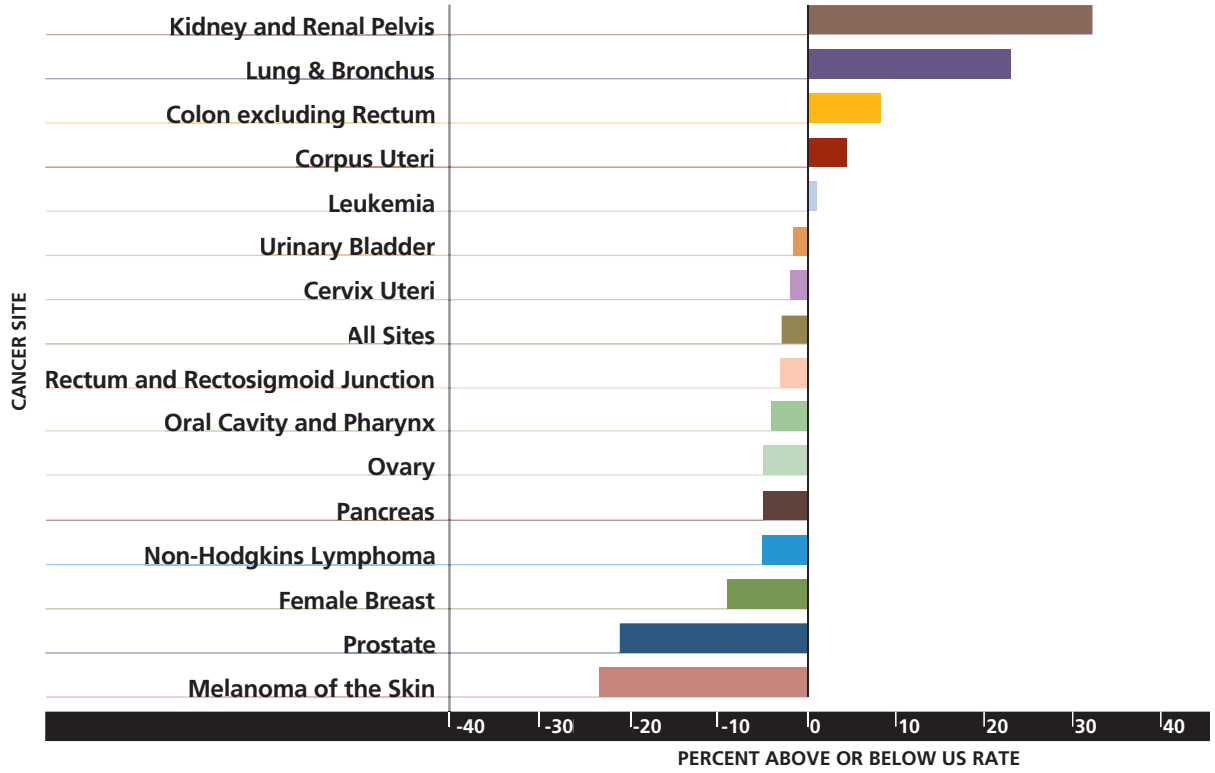
How many people are expected to die this year?

Cancer is the second leading cause of death of adults in Indiana following heart disease. Cancer is the second leading cause of death in children between ages 5 and 14 following accidental death. In 2003, about 13,000 Hoosiers are expected to die of the disease, which is approximately 36 people every day or almost two people every hour.

How does incidence and mortality in Indiana compare with the rest of the U.S.?

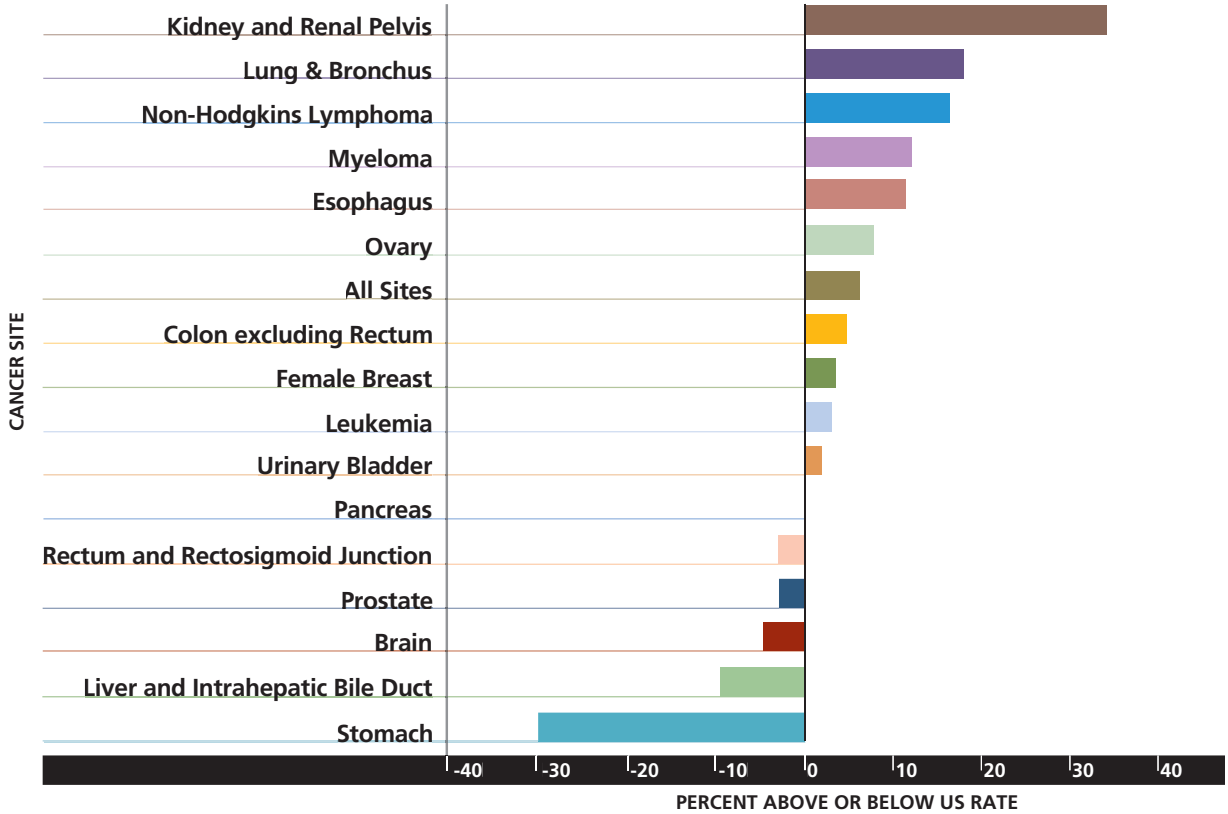
Indiana's incidence rate for cancer in 2000 was 451.4 per 100,000 (Figure 2), or about 3% lower than the national rate of 462.9/100,000. However, the state's mortality rate during the same year was about 5% higher than the national rate, or 213.7 vs. 202.8 per 100,000 (Figure 3). However, there are exceptions when comparing rates for various cancers. Both state incidence and mortality rates for lung, bronchus, kidney and renal pelvis cancers were especially higher than national rates in 2000, while the state incidence of prostate cancer and melanoma of the skin and the mortality of stomach cancer were lower than US rates during the same year.

Figure 2. How Do Indiana Cancer Incidence Rates Compare To U.S. Incidence Rates?



Source: See Figure 3

Figure 3. How Do Indiana Cancer Mortality Rates Compare To U.S. Mortality Rates?



Source: Indiana State Department of Health — Indiana State Cancer Registry and the Epidemiology Resource Center, Data Analysis Team, May 2003. National rates are from 11 registries of the Surveillance, Epidemiology and End Results (SEER) Program of the National Cancer Institute representing 14% of the U.S. population. Incidence figures exclude basal and squamous cell skin cancers and in situ carcinoma except bladder.

Is the cancer burden in Indiana lessening?

From 1996 to 2000, incidence rates in Indiana increased over 5% from 425.3 to 448.1 per 100,000. Prostate, testicular, pancreatic, kidney and renal pelvis cancers and melanoma of the skin experienced even higher increases of 12 to 16%, while cervical, oral cavity and pharynx cancers experienced about a 7% decline. The more common cancers of the breast, lung, bronchus and colon remained relatively stable from 1996 to 2000.

During the same period, mortality rates for all cancer sites have decreased slightly from 217.3 to 213.7 per 100,000. Even greater declines of 12, 16 and 25% declines were witnessed for breast, prostate, cervical cancers, respectively. However, the rate for lung and bronchus cancers remained relatively constant at 65 per 100,000, the highest mortality rate among cancer sites.

These statistics indicate that some progress may have been made in the early detection of certain cancers, and that there has been a slight reduction in incidence and mortality of some cancers. However, a significant cancer burden still exists for Hoosiers that requires continued and more targeted cancer control programs.

How many people today survive cancer?

Nationally, the five-year survival rate for all cancers combined has increased to 62%. This means approximately 19,344 Hoosiers who get cancer in 2003 will survive five years after diagnosis. Factors such as early stage of disease at diagnosis can greatly improve the probability of survival after five years.

After adjusting for normal life expectancy (factors such as dying of heart disease, accidents, and diseases of old age), the 5-year relative survival rate represents persons who are living five years after diagnosis, whether disease-free, in remission, or under treatment with evidence of cancer. While 5-year relative survival rates are useful in monitoring progress in the early detection and treatment of cancer, they do not represent the proportion of people who are cured permanently, since cancer can affect survival beyond five years after diagnosis.

Although these rates provide some indication about the average survival experience of cancer patients in a given population, they are less informative when used to predict individual prognosis and should be interpreted with caution. First, 5-year relative survival rates are based on patients who were diagnosed and treated at least five years ago and do not reflect recent advances in treatment. Second, information about detection methods, treatment protocols, additional illnesses, tumor spread at diagnosis, and behaviors that influence survival are not taken into account in the estimation of survival rates.

What are the costs of cancer?

The National Institutes of Health estimate overall costs for cancer in 2002 at $171.6 billion: $60.9 billion for direct medical costs (total of all health expenditures); $15.5 billion for indirect morbidity costs (cost of lost productivity due to illness); and, $95.2 billion for indirect mortality costs (cost of lost productivity due to premature death).

Lack of health insurance and other barriers to health care prevent many Americans from receiving optimal health care. According to 2000 National Health Interview Survey data, about 17% of Americans under age 65 have no health insurance and about 27% of persons 65 and over have only Medicare coverage. During 1999 and 2000, almost 18% of Americans aged 18 to 64 years reported not having a regular source of health care. Additionally, about 6% of 18- to 64-year-old adults say cost was a barrier to obtaining needed health care in the previous year.

How does Indiana keep track of changes in cancer risk?

The Indiana State Cancer Registry was established for compiling cancer cases and other related data necessary to conduct epidemiological studies of cancer and develop appropriate preventive and control programs. The data in this registry allow measurement of progress toward reaching the state goal of reducing cancer incidence and mortality in Indiana.

Table 3. Average Indiana Cancer Incidence and Mortality, 1996-2000

INCIDENCE

BOTH SEXES	ALL RACES		WHITE		AFRICAN AMERICAN	
Site	Count	Rate	Count	Rate	Count	Rate
All Sites	**130,204**	**442.3**	**120,288**	**439.1**	**8,781**	**477**
Colon and Rectum	16,456	56.1	15,276	55.7	1,084	61.7
Lung and Bronchus	22,081	74.8	20,407	74.1	1,556	86.1
Melanoma of the Skin	3,564	12.1	3,477	12.8	19	1.1
Breast	20,275	69.2	18,868	69.3	1,233	64.9
MALE	**ALL RACES**		**WHITE**		**AFRICAN AMERICAN**	
Site	Count	Rate	Count	Rate	Count	Rate
All Sites	**64,722**	**512.9**	**59,536**	**505.2**	**4,607**	**610.1**
Colon and Rectum	8,145	67.2	7,573	66.7	527	73.2
Lung and Bronchus	13,094	103.8	12,119	102.6	911	122.6
Melanoma of the Skin	2,025	15.4	1,990	16.2	6	0.8
Prostate	15,783	125.6	14,077	119.6	1,522	207.4
Testis	765	5.1	734	5.4	13	1.1
FEMALE	**ALL RACES**		**WHITE**		**AFRICAN AMERICAN**	
Site	Count	Rate	Count	Rate	Count	Rate
All Sites	**65,482**	**400**	**60,752**	**400.4**	**4,174**	**390.3**
Colon and Rectum	8,311	48.4	7,703	48	557	53.8
Lung and Bronchus	8,987	54.4	8,288	53.9	645	61.8
Melanoma of the Skin	1,539	9.8	1,487	10.3	13	1.3
Breast	20,128	125.3	18,735	126.1	1,220	112.8
Cervix Uteri	1,456	9.4	1,286	9.2	151	13.3

MORTALITY

BOTH SEXES	ALL RACES		WHITE		AFRICAN AMERICAN	
Site	Count	Rate	Count	Rate	Count	Rate
All Sites	**62,996**	**214.6**	**57,919**	**211**	**4,865**	**278.8**
Colon and Rectum	6,785	23.2	6,180	22.5	580	34.2
Lung and Bronchus	19,142	65	17,717	64.3	1,376	78
Melanoma of the Skin	823	2.8	812	3	10	0.6
Breast	4,804	16.4	4,359	16	428	23.7
MALE	**ALL RACES**		**WHITE**		**AFRICAN AMERICAN**	
Site	Count	Rate	Count	Rate	Count	Rate
All Sites	**32,686**	**274.8**	**30,035**	**269.3**	**2,555**	**376.1**
Colon and Rectum	3,262	28.1	2,977	27.3	277	41.1
Lung and Bronchus	11,487	93.4	10,629	92.2	830	117.7
Melanoma of the Skin	511	4.1	504	4.3	7	1.1
Prostate	3,580	34.5	3,123	32	444	78.8
Testis	30	0.2	27	0.2	2	0.2
FEMALE	**ALL RACES**		**WHITE**		**AFRICAN AMERICAN**	
Site	Count	Rate	Count	Rate	Count	Rate
All Sites	**30,307**	**177.5**	**27,881**	**174.8**	**2,310**	**221.9**
Colon and Rectum	3,523	19.9	3,203	19.3	303	29.7
Lung and Bronchus	7,653	45.5	7,086	45.1	546	52.5
Melanoma of the Skin	312	1.9	308	2	3	0.3
Breast	4,734	28.4	4,295	27.6	423	40.1
Cervix Uteri	501	3.1	440	3	59	5.6

Source: Indiana State Department of Health - Indiana State Cancer Registry and the Epidemiology Resource Center, Data Analysis Team, May 2003
Rates are age-adjusted per 100,000 population to the 2000 U.S. Population Standard.

Table 4. Average Indiana Cancer Incidence Rates by County, 1996 - 2000

County	All Cancers		Female Breast		Colon & Rectum		Lung		Prostate	
	Count	Rate	Count	Rate	Count	Rate	Count	Rate	Count	Rate
Adams	573	347.1	97	110.8	103	60.9	61	37.7	45	64.0
Allen	6,005	400.7	1,052	126.7	826	55.7	930	62.7	627	99.0
Bartholomew	1,501	430.4	251	131.0	178	51.6	235	67.0	129	87.0
Benton	270	501.4	49	164.0	42	75.2	43	80.0	37	154.5
Blackford	397	488.3	67	147.1	50	61.1	58	70.0	58	169.2
Boone	964	445.7	153	127.6	116	53.9	164	76.7	118	132.5
Brown	211	264.3	34	79.1	25	34.1	37	47.1	27	73.4
Carroll	363	334.0	42	69.5	47	43.1	56	50.4	61	124.0
Cass	982	437.0	138	116.1	146	62.9	179	79.1	132	130.7
Clark	2,155	452.5	295	111.4	285	60.8	419	87.4	271	137.6
Clay	779	531.3	128	163.2	87	57.1	145	96.2	81	125.7
Clinton	760	420.7	94	102.0	96	51.0	134	74.2	79	100.7
Crawford	234	427.3	35	126.0	23	43.1	51	90.6	18	#
Daviess	682	419.5	105	118.5	94	56.1	107	65.7	94	133.2
Dearborn	972	458.5	148	128.6	133	65.1	133	63.8	151	157.3
Decatur	541	432.8	86	130.4	66	52.7	102	80.5	77	136.7
DeKalb	790	429.5	129	129.0	97	53.3	136	74.6	88	108.6
Delaware	2,602	428.1	391	119.1	334	54.6	476	76.8	312	117.9
Dubois	760	389.0	100	96.6	123	62.0	110	56.7	96	111.1
Elkhart	3,071	383.8	530	120.4	393	49.9	476	60.0	299	86.8
Fayette	590	401.1	83	107.7	80	53.6	111	74.2	62	92.7
Floyd	1,639	467.3	248	126.9	215	61.7	289	82.5	251	179.0
Fountain	510	487.5	77	139.7	68	62.6	87	81.0	54	112.2
Franklin	439	410.6	69	120.9	74	69.9	55	51.1	59	121.3
Fulton	481	411.0	63	101.0	74	60.9	82	68.9	67	123.3
Gibson	791	428.5	105	105.6	110	57.3	134	70.5	104	128.4
Grant	1,892	459.6	293	133.3	257	61.3	311	73.1	203	111.5
Greene	833	437.8	101	102.8	124	63.9	130	66.6	100	120.3
Hamilton	2,452	392.5	450	124.8	265	47.8	307	54.0	292	109.5
Hancock	1,080	416.4	163	113.5	127	50.9	200	78.3	94	78.7
Harrison	677	423.8	100	116.0	92	59.3	126	79.0	85	124.2
Hendricks	1,839	428.4	301	127.4	210	52.3	311	75.0	217	115.6
Henry	1,307	460.8	186	121.2	158	54.7	230	78.6	164	132.0
Howard	1,872	421.8	318	130.0	254	57.9	325	72.2	217	112.6
Huntington	852	429.6	149	143.0	131	63.5	134	67.6	75	88.0
Jackson	952	453.4	135	121.1	120	56.9	179	84.7	91	107.1
Jasper	707	492.7	105	136.1	99	69.3	108	74.5	102	163.1
Jay	496	407.4	66	103.6	81	65.5	72	56.7	54	99.1
Jefferson	808	500.8	132	151.9	107	67.5	131	79.9	117	164.2
Jennings	544	438.3	82	122.7	65	54.3	117	92.9	48	91.4
Johnson	2,114	418.9	390	139.2	240	48.4	354	71.8	231	108.4
Knox	1,126	504.5	142	118.7	193	83.8	192	84.4	117	122.1
Kosciusko	1,365	389.7	215	114.7	185	53.4	226	64.5	133	85.6
LaGrange	474	339.1	73	97.3	70	52.3	84	60.2	45	71.8
Lake	11,261	460.4	1,668	124.3	1,479	61.0	1,734	70.2	1,754	167.5
LaPorte	2,603	451.5	382	123.8	322	55.9	414	71.2	360	146.2

continued

Table 4. Average Indiana Cancer Incidence Rates by County, 1996 - 2000, Continued

	All Cancers		Female Breast		Colon & Rectum		Lung		Prostate	
County	Count	Rate	Count	Rate	Count	Rate	Count	Rate	Count	Rate
Lawrence	1,256	489.8	156	113.3	177	68.7	222	84.7	182	164.3
Madison	3,376	453.6	457	113.2	378	50.2	577	76.2	458	142.7
Marion	18,794	488.9	3,042	140.8	2,060	54.5	3,596	94.7	2,019	128.3
Marshall	980	429.3	151	124.0	122	52.9	161	69.8	132	133.9
Martin	289	502.9	37	124.7	37	64.9	37	63.1	45	168.8
Miami	773	433.0	107	110.4	96	54.1	122	67.5	88	106.8
Monroe	1,955	438.0	348	142.6	215	49.5	274	62.8	222	119.6
Montgomery	876	440.7	115	106.4	114	57.1	137	68.3	151	180.2
Morgan	1,365	458.8	197	120.2	159	55.7	254	85.5	188	145.8
Newton	331	443.6	50	125.2	42	55.5	54	71.8	54	158.1
Noble	768	380.1	103	92.9	114	57.2	148	73.8	76	89.2
Ohio	129	422.5	20	117.9	8	#	26	84.9	26	182.1
Orange	455	423.4	64	113.7	56	50.7	90	82.3	55	112.4
Owen	451	406.5	55	96.2	50	45.9	92	82.2	52	107.5
Parke	424	435.0	62	122.2	43	43.9	73	73.5	60	134.7
Perry	412	389.5	57	99.8	69	64.8	69	65.3	46	101.8
Pike	305	408.3	46	119.1	37	47.8	50	66.0	36	109.0
Porter	2,922	438.2	431	115.8	359	55.8	416	63.0	481	175.5
Posey	518	387.6	78	108.2	67	51.5	89	65.9	67	113.2
Pulaski	331	434.6	44	115.4	54	67.1	40	52.0	52	147.4
Putnam	745	436.2	112	125.8	86	51.4	143	83.2	91	119.1
Randolph	702	441.5	85	103.3	92	57.4	123	75.4	79	111.4
Ripley	601	446.4	104	143.8	95	69.5	84	62.3	80	133.0
Rush	465	464.4	56	106.0	62	60.1	81	79.8	51	113.3
St. Joseph	6,338	473.0	998	137.4	756	54.5	1,055	78.3	816	143.8
Scott	482	456.1	64	109.1	67	65.4	100	94.4	66	150.3
Shelby	873	411.5	127	111.4	123	58.4	141	66.1	94	104.8
Spencer	434	416.8	64	116.2	52	49.6	64	61.1	47	98.5
Starke	565	451.4	84	125.8	61	48.5	108	83.9	90	154.0
Steuben	607	385.5	89	104.1	97	62.9	92	58.3	47	66.7
Sullivan	522	440.5	65	105.4	72	59.6	109	90.6	49	93.4
Switzerland	187	410.2	26	109.2	30	66.5	30	64.3	27	134.1
Tippecanoe	2,588	467.8	403	134.8	289	53.2	403	74.7	304	130.5
Tipton	361	392.7	56	113.2	47	49.7	51	55.1	36	94.1
Union	149	399.0	19	#	18	#	21	56.5	20	115.0
Vanderburgh	4,233	440.4	699	133.4	573	57.7	828	84.7	431	109.3
Vermillion	465	477.8	67	128.2	75	75.1	85	86.7	57	134.7
Vigo	2,636	470.1	444	142.7	348	59.7	508	89.1	240	104.5
Wabash	803	409.2	124	117.7	117	55.7	135	68.5	73	84.4
Warren	151	332.9	15	#	21	47.4	30	64.3	23	114.9
Warrick	1,057	439.5	171	127.3	135	58.1	173	72.2	126	118.7
Washington	535	406.9	58	83.4	66	51.1	93	69.9	72	129.0
Wayne	1,864	453.4	288	128.9	212	50.4	340	80.5	254	140.0
Wells	495	339.1	76	95.9	70	47.6	61	41.4	70	111.4
White	669	475.0	87	115.1	74	51.5	100	68.3	98	148.2
Whitley	598	387.8	105	126.3	95	61.2	98	63.5	46	67.2

Rate suppressed if fewer than 20 cases.
Source: Indiana State Department of Health — Indiana State Cancer Registry and the Epidemiology Resource Center, Data Analysis Team, May 2003.
Rates are per 100,000 population age-adjusted to the 2000 U.S. Population Standard.

Table 5. Average Indiana Cancer Mortality Rates by County, 1996 - 2000

County	All Cancers		Female Breast		Colon & Rectum		Lung		Prostate	
	Count	Rate	Count	Rate	Count	Rate	Count	Rate	Count	Rate
Adams	271	157.1	23	23.5	36	19.6	12	#	60	36.2
Allen	3,177	213.9	256	30.1	362	24.5	201	38.0	885	59.7
Bartholomew	715	209.0	60	30.9	69	20.6	29	23.0	214	61.5
Benton	126	216.8	6	#	17	#	4	#	40	70.1
Blackford	176	214.7	14	#	26	31.2	17	#	35	43.6
Boone	481	219.6	48	36.7	49	22.0	29	36.4	132	61.4
Brown	165	218.5	22	51.1	15	#	11	#	52	66.4
Carroll	205	187.7	15	#	22	20.6	10	#	61	55.3
Cass	486	211.4	26	20.0	73	31.4	33	41.2	142	62.3
Clark	1,103	235.0	80	29.4	115	25.3	51	31.2	396	83.0
Clay	367	240.6	31	35.6	34	21.7	23	42.0	114	75.2
Clinton	397	207.9	25	22.9	55	27.6	25	34.9	126	68.4
Crawford	117	214.4	6	#	10	#	5	#	43	77.7
Daviess	321	192.5	25	24.2	36	21.2	21	32.1	100	60.9
Dearborn	462	227.7	19	#	66	33.3	31	44.3	147	71.2
Decatur	249	196.8	17	#	23	18.1	19	#	84	65.9
DeKalb	392	214.7	28	27.5	43	23.6	24	36.4	125	68.7
Delaware	1,310	213.7	94	26.2	142	23.3	70	32.9	427	69.1
Dubois	368	186.1	20	18.2	42	21.1	27	35.5	94	47.7
Elkhart	1,512	191.3	107	23.5	177	22.6	87	30.4	417	52.8
Fayette	330	221.1	26	28.4	32	21.4	17	#	100	66.2
Floyd	767	220.3	67	33.6	65	18.7	42	38.8	245	70.0
Fountain	270	247.0	26	43.0	27	24.7	24	55.9	81	72.7
Franklin	184	172.5	7	#	28	26.3	12	#	39	37.4
Fulton	254	215.0	20	29.1	27	22.1	9	#	76	64.0
Gibson	378	198.1	15	#	53	26.7	21	29.0	111	58.4
Grant	930	223.1	85	36.4	110	26.2	52	35.8	279	65.6
Greene	355	181.0	25	21.6	51	26.1	24	31.7	93	46.9
Hamilton	960	172.5	89	27.1	75	14.3	54	30.9	276	50.0
Hancock	499	202.5	34	24.0	40	16.0	30	36.1	163	64.5
Harrison	322	208.4	23	26.6	26	17.5	12	#	108	69.2
Hendricks	833	206.4	62	26.8	74	18.9	42	31.0	276	67.3
Henry	614	214.0	45	27.9	51	17.9	28	26.4	202	69.4
Howard	948	216.3	65	25.7	104	24.1	42	27.8	329	73.9
Huntington	407	197.9	27	23.5	59	27.9	24	30.2	121	59.3
Jackson	459	215.7	44	37.7	51	23.7	31	41.2	130	61.2
Jasper	279	195.7	15	#	39	28.0	20	38.2	79	54.4
Jay	273	216.7	17	#	35	27.9	20	43.2	75	59.1
Jefferson	347	216.4	16	#	48	30.5	18	#	101	62.3
Jennings	314	261.9	19	#	27	23.6	23	59.1	114	90.7
Johnson	1,041	210.4	92	32.0	97	19.7	52	30.9	353	71.8
Knox	512	220.8	39	30.7	71	30.0	40	44.7	151	64.7
Kosciusko	706	203.2	57	29.9	83	24.0	41	31.1	218	62.5
LaGrange	237	172.5	24	31.7	23	17.0	11	#	64	45.6
Lake	5,633	232.3	500	36.8	648	27.1	339	38.7	1,571	63.8
LaPorte	1,266	219.8	104	32.8	154	26.9	53	25.0	364	62.9

continued

Table 5. Average Indiana Cancer Mortality Rates by County, 1996 - 2000, Continued

County	All Cancers		Female Breast		Colon & Rectum		Lung		Prostate	
	Count	Rate	Count	Rate	Count	Rate	Count	Rate	Count	Rate
Lawrence	547	211.6	36	24.8	62	23.9	32	33.3	169	64.5
Madison	1,592	211.8	101	23.9	177	23.6	88	32.2	499	65.5
Marion	8,874	234.5	685	30.8	850	22.7	529	42.0	2,845	75.1
Marshall	473	204.0	43	32.7	55	23.3	22	27.2	137	59.5
Martin	135	239.0	7	#	22	40.0	11	#	39	67.3
Miami	397	224.5	32	32.4	40	22.5	20	32.4	112	62.9
Monroe	885	205.1	64	25.9	90	20.9	51	34.7	259	59.8
Montgomery	414	205.8	22	18.2	53	26.3	26	35.7	110	54.6
Morgan	621	217.1	35	21.6	62	22.4	28	26.8	218	75.5
Newton	155	208.4	6	#	20	26.6	4	#	49	65.8
Noble	438	219.1	35	31.6	49	24.6	32	45.5	145	72.6
Ohio	73	240.4	5	#	3	#	6	#	30	98.6
Orange	240	221.6	14	#	29	26.2	15	#	76	70.0
Owen	213	196.5	12	#	20	19.2	8	#	80	73.0
Parke	185	188.1	11	#	23	24.4	11	#	64	64.7
Perry	223	208.8	19	#	32	29.2	9	#	62	57.4
Pike	138	182.1	9	#	18	#	4	#	42	55.8
Porter	1,331	208.0	103	27.6	141	22.5	72	33.2	360	55.4
Posey	263	198.6	18	#	27	20.8	19	#	80	59.4
Pulaski	153	193.7	14	#	16	#	10	#	40	51.2
Putnam	363	213.1	34	37.8	36	21.2	26	46.5	122	71.1
Randolph	313	193.0	17	#	36	21.8	14	#	97	59.1
Ripley	275	198.6	14	#	31	21.6	18	#	80	58.2
Rush	236	228.8	11	#	25	23.3	10	#	65	62.6
St. Joseph	2,894	209.1	223	28.2	305	21.6	170	33.2	840	61.2
Scott	246	237.0	16	#	25	25.4	15	#	85	80.3
Shelby	403	190.7	36	29.8	37	17.5	14	#	119	56.1
Spencer	201	195.7	13	#	14	#	9	#	60	57.3
Starke	300	240.9	24	35.7	30	24.4	23	50.1	99	77.9
Steuben	334	215.4	22	25.5	37	24.7	18	#	92	59.0
Sullivan	276	229.1	16	#	40	32.6	8	#	92	76.5
Switzerland	96	216.6	3	#	12	#	5	#	23	51.0
Tippecanoe	1,161	214.5	85	27.3	100	18.5	61	31.6	349	64.9
Tipton	179	190.4	17	#	24	24.9	9	#	50	53.0
Union	73	195.5	6	#	12	#	4	#	20	53.4
Vanderburgh	2,151	216.9	136	24.3	231	23.0	117	33.7	680	68.5
Vermillion	240	238.1	11	#	26	25.1	11	#	73	73.5
Vigo	1,362	234.8	108	32.6	152	25.9	52	26.1	454	78.3
Wabash	402	194.5	35	29.7	49	23.1	25	32.3	109	54.1
Warren	103	229.6	3	#	8	#	11	#	31	67.7
Warrick	458	198.3	38	28.7	42	18.7	24	28.4	142	60.6
Washington	304	233.7	11	#	28	22.0	21	53.9	105	79.8
Wayne	898	213.1	57	23.6	93	21.9	57	36.2	269	63.7
Wells	279	186.4	19	#	29	18.6	23	45.2	86	59.0
White	288	201.2	14	#	22	15.0	17	#	88	60.1
Whitley	293	187.7	29	32.5	42	26.7	11	#	83	53.2

Rate suppressed if fewer than 20 cases.
Source: Indiana State Department of Health — Indiana State Cancer Registry and the Epidemiology Resource Center, Data Analysis Team, March 2003.
Rates are per 100,000 population age-adjusted to the 2000 U.S. Population Standard.

Breast Cancer

Bottom Line

Nearly all breast cancers that are detected early can be treated successfully. A screening mammogram is the most effective way to detect breast cancer at an early stage. Annual mammograms for women aged 40 or older and annual clinical breast exams by a doctor or nurse are recommended for the early detection of breast cancer. Some breast cancer risk factors, such as family history, age, and race or ethnicity, cannot be changed. However, women can decrease their risk of developing breast cancer by avoiding obesity, staying physically active, and reducing alcohol use. Decisions about hormone supplementation should be made in consultation with a physician.

Risk Factors

A number of personal characteristics and behaviors have been found to increase the chances of developing breast cancer. They include:

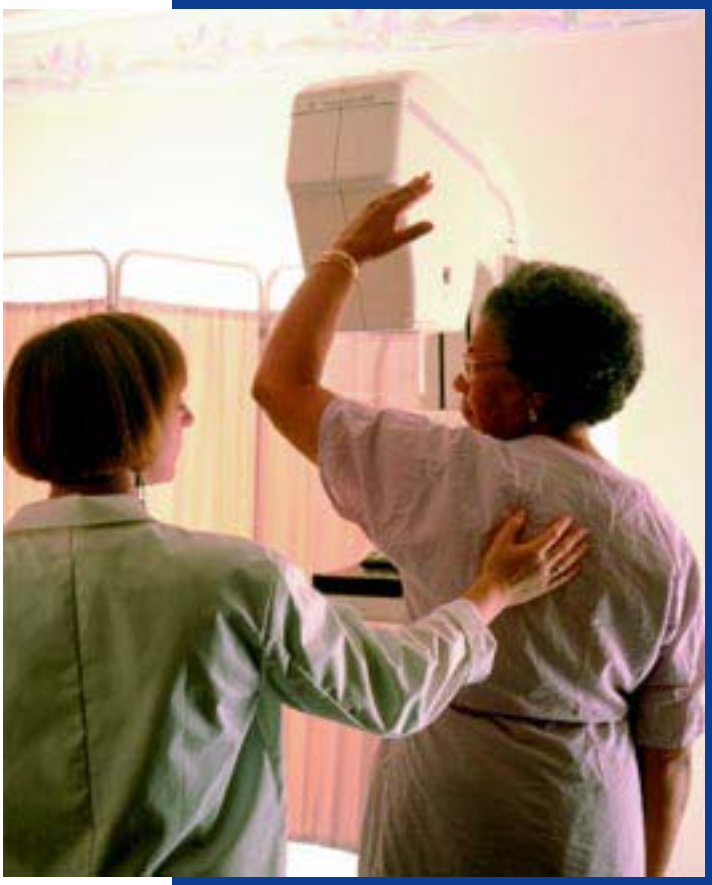
- Gender (male breast cancer is rare)
- Age (the risk of breast cancer increases as you age; 95% of breast cancers occur in women aged 40 and older)
- Family history of breast cancer/genetic factors (about 10% of breast cancers are hereditary; BRCA1 and BRCA2 account for 40-50% of familial breast cancers)
- Personal history of breast cancer (women with breast cancer in one breast are 3 - 4 times more likely to develop cancer in the other breast than the general population)
- History of atypical hyperplasia on a previous breast biopsy (the risk of breast cancer is 4 - 5 times that of the general population)
- Long menstrual history (menstrual periods that start early and end late in life; one of several factors that result in a longer lifetime exposure to estrogen which promotes breast cell division)
- Use of postmenopausal hormone replacement therapy (especially with estrogen plus progestin)
- Never having a child or having a first child born after age 30
- Obesity (especially after menopause)
- Alcohol use (especially two or more drinks daily)

Prevention/Screening/Early Detection

Management of risk factors may help some women reduce their chances of being diagnosed with breast cancer. Mammography can detect breast cancer about 1.7 years earlier than by clinical or self-breast examination alone, often before physical symptoms develop. Studies have shown that early detection saves lives and increases treatment options. In 2000, 86.3% of Indiana women aged 40 and older surveyed in the Indiana Behavioral Risk Factor Surveillance System (BRFSS) reported ever having had a mammogram and 70.8% of women 40 and over reported having a mammogram within the previous 12 months. Improved mammography screening to detect breast cancer early, along with better treatment options, have made breast cancer a more curable disease than it was 30 years ago.

Cancer Burden

Breast cancer is the most common cancer, other than skin cancer, among women in Indiana, regardless of race. Breast

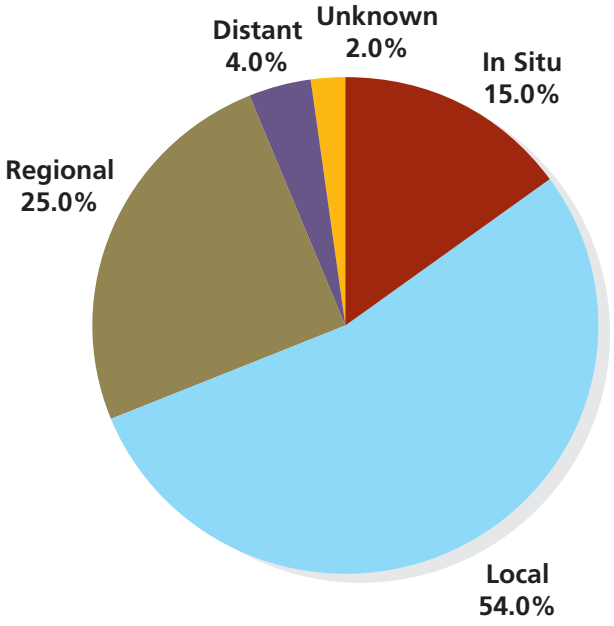


cancer accounts for nearly one-third of all cancers diagnosed in women. Only lung cancer accounts for more cancer deaths in women. The average annual mortality rate for breast cancer in Indiana women from 1996-2000 was 28.4 per 100,000. This represents 4,734 deaths from breast cancer over the 5-year time period. The risk of developing breast cancer increases with age. Nationally, 95% of new cases and 97% of breast cancer deaths occur in women aged 40 and older. Similarly, between 1996 and 2000 in Indiana, approximately 94% of women who developed breast cancer were aged 40 and over. Women 40 and over accounted for 96.8% of the breast cancer deaths. In Indiana and nationally, African-American women are less likely to be diagnosed with breast cancer, but have a greater mortality rate from breast cancer than do white women. The steady increase in breast cancer incidence from 1940 to 1982 is attributed to the gradual increase in underlying risk factors for breast cancer, such as earlier menarche, delayed childbearing, and smaller family size. Improved mammography screening rates contributed to an increase in the reported incidence of the disease from 1982 through 1988, and at the same time, caused a shift to earlier stage diagnosis of smaller, more easily treatable cancers. Earlier diagnosis, in turn, has resulted in a reduction in mortality from breast cancer. From 1992 to 1998, breast cancer mortality declined significantly, with the largest decreases in younger women — both African American and non-Hispanic white women. About 30 men are diagnosed with breast cancer each year in Indiana. Clinically, breast cancer in men is very similar to breast cancer in women, but the prognosis is often poorer for men because they tend to be diagnosed at a later stage than women.

Stages at Diagnosis

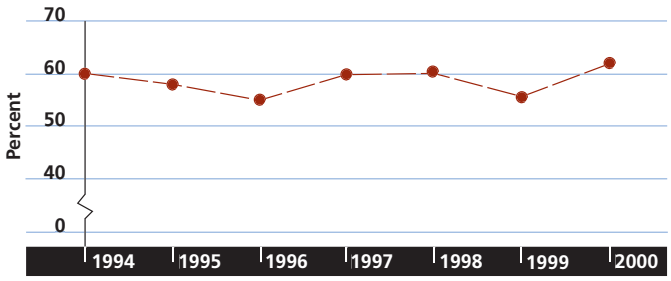
Nine out of 10 women remain in remission 10 years after diagnosis when the tumor is detected early (in situ or at a local stage). Nationally, from 1992 to 1997, 63% of breast cancer cases were diagnosed early. Nationally, the five-year relative survival rate for women diagnosed at a local stage was 96% in 1992-1997. In Indiana, 68.9% of women's breast cancer from 1996 to 2000 was diagnosed early (Figure 4). However, African-American women were significantly less likely to have their breast cancers diagnosed at an early stage (61.97% vs. 69.38% for white women). In order to improve the odds of survival, early detection through mammography screening provides the best chance of discovering breast cancer at an early stage.

Figure 4. Breast Cancer Average Stage At Diagnosis, 1996-2000



Source: Indiana State Department of Health - Indiana State Cancer Registry and the Epidemiology Resource Center, Data Analysis Team, May 2003.

Figure 5. Mammogram In Past Year, Women 40+



Source: Indiana Behavioral Risk Factor Surveillance System, Indiana Department of Health, 2003.

Table 6. Female Breast Cancer Incidence And Mortality, 1996-2000

	INCIDENCE	MORTALITY
	Female	Female
All Races	**125.3**	**28.4**
White	126.1	27.6
African American	112.8	40.1

Source: Indiana State Department of Health - Indiana State Cancer Registry and the Epidemiology Resource Center, Data Analysis Team, May 2003
Rates are per 100,000 female population and age adjusted to the 2000 U.S. Population standard.

Cervical Cancer

Bottom Line

With avoidance of controllable risk factors and regular screening Pap tests, as recommended by the American Cancer Society, cancer of the uterine cervix is almost 100% preventable and curable. In Indiana, while 93.9% of women, surveyed by the Behavioral Risk Factor Surveillance System 2000 survey, reported having had a Pap smear at some time in their life, only 61.1% had a Pap test within the preceding 12 months.

Risk Factors That Can Be Controlled

The most important risk factor for cervical cancer is infection with the human papillomavirus (HPV). This virus is passed from person to person during sex. The following behaviors and situations increase the risk for infection with HPV and are therefore risk factors for cervical cancer:

- Having multiple sexual partners
- Unprotected sex, especially at an early age
- Having a sexual partner who has had multiple sexual partners
- Other sexually transmitted infections, particularly HIV

Another risk factor that can be altered is:

- Cigarette smoking (women who smoke have about twice the risk of non-smokers)

Risk Factors That Cannot Be Changed

- Age (approximately 2 out of 3 cervical cancer deaths occur among women aged 55+)
- Race/ethnicity (Vietnamese women have the highest incidence of cervical cancer in the US, followed by Hispanics, Alaska Natives, and Koreans. Hispanic women have a risk about twice as high as white women. African-American women have the highest age-adjusted cervical cancer mortality rate, though comparable data for Vietnamese women is not available.)

Prevention/Screening/Early Detection

Almost all cervical cancers can be prevented. First, to prevent precancers, women should avoid behaviors that place them at higher risk. Young women can delay their first sexual experience until they are older. Women of all ages can reduce their risk of HPV infection by limiting their number of sexual partners and by using condoms during sexual intercourse. Condoms provide partial protection from HPV as well as from other sexually transmitted diseases including HIV. Women can avoid smoking; those women who are current smokers should try to quit. Second, women can prevent the progression of precancers to invasive cervical cancer by early detection through regular Pap tests and prompt treatment (Figure 7). Precancers do not cause pain or other symptoms and are detected only if a woman has a pelvic exam and Pap test. Signs and symptoms of cervical cancer include abnormal vaginal discharge and abnormal vaginal bleeding or spotting. Invasive cervical cancer has decreased significantly over the past 25 years due to screening with Pap tests.

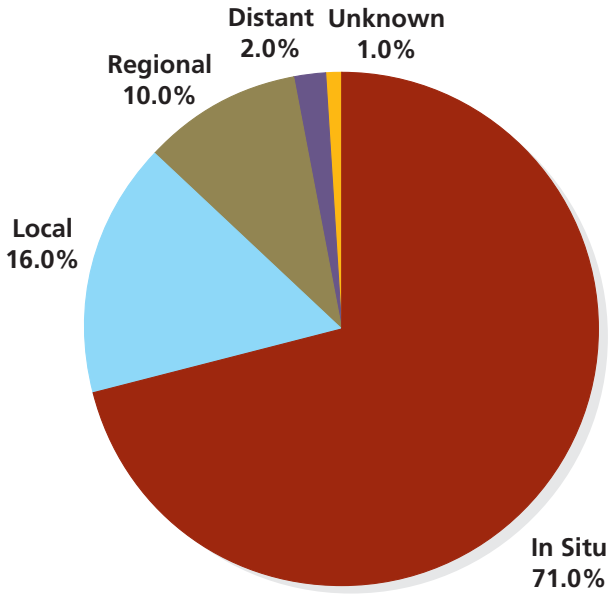
Cancer Burden

In 2000, 283 Indiana women were diagnosed with invasive cervical cancer for an age-adjusted incidence rate of 4.7 per 100,000. The incidence rate of cervical cancer in Indiana for 2000 is significantly lower than the national rate of 7.6 per 100,000 as estimated by the Surveillance, Epidemiology and End Results (SEER) 9 areas rate. Eighty Indiana women died of cervical cancer in 2001 for a mortality rate of 2.5 per 100,000, compared with an estimated national rate of 2.9 per 100,000 (Table 5). Over 12,000 women die in the US each year from cervical cancer. As Pap screening becomes more prevalent, precancerous lesions of the cervix will be detected far more frequently than invasive cancer.

Stages at Diagnosis

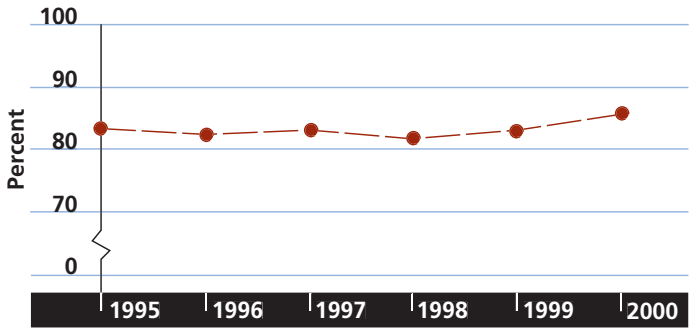
Nine out of 10 women remain in remission 10 years after diagnosis when the tumor is detected early and followed by prompt, appropriate treatment. Nationally, from 1992 to 1999, 54% of cervical cancer cases were diagnosed early (in situ or at a local stage). Nationally, the five-year relative survival rate for women diagnosed at a local stage was 92.2% in 1992-1999. In Indiana, from 1996 to 2000, 87% of women's cervical cancer was diagnosed early at the in situ or local stage (Figure 6). However, African-American women in Indiana are more likely to be diagnosed at a late stage than are white women. Regular Pap screening provides the best chance of discovering cervical cancer in situ or at a local stage.

Figure 6. Cervical Cancer Average Stage At Diagnosis, 1996-2000



Source: Indiana State Department of Health - Indiana State Cancer Registry and the Epidemiology Resource Center, Data Analysis Team, May 2003.

Figure 7. Pap Test In Past Three Years, Women 18+



Source: Indiana Behavioral Risk Factor Surveillance System, Indiana Department of Health, 2003.

Table 7. Cervical Cancer Average Incidence And Mortality, 1996-2000

	INCIDENCE	MORTALITY
	Female	Female
All Races	**9.4**	**3.1**
White	9.2	3.0
African American	13.3	5.6

Source: Indiana State Department of Health - Indiana State Cancer Registry and the Epidemiology Resource Center, Data Analysis Team, May 2003.
Rates are per 100,000 female population and age-adjusted to the 2000 U.S. Population standard.

Colon & Rectum Cancer

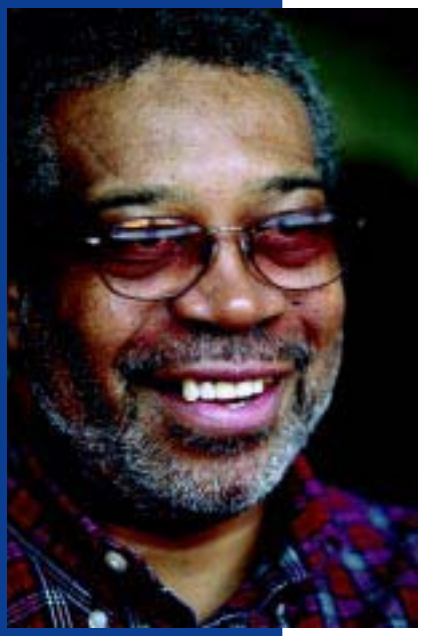
Bottom Line

Screening tests offer a powerful opportunity for the prevention, early detection, and successful treatment of colorectal cancers. Yet fewer than 37% of Americans ages 50 and older follow the American Cancer Society's recommended screening guidelines for colorectal cancer. While people cannot change their genetic makeup or family health history, most people can reduce their risk of colorectal cancer by following screening guidelines, eating a healthy, low-fat, high fiber diet, and increasing their level of physical activity.

Risk Factors

Several risk factors may contribute to the development of colorectal cancer. They include:

- Age (over 75% of colorectal cancers are diagnosed in people over age 50)
- Race (African Americans are more likely than other racial and ethnic groups to develop colorectal cancer)
- Personal or family history of colorectal and other cancers, colon polyps, or inflammatory bowel disease (nearly 10% are caused by inherited gene mutations)
- Physical inactivity
- A diet that is high in fat (especially from red meat) or low in fruits and vegetables
- Obesity
- Smoking
- Alcohol



Prevention/Screening/Early Detection

Modifiable factors for colorectal cancer include healthy eating, especially fruits and vegetables, regular physical activity, maintaining suggested body weight, and avoiding smoking. Unfortunately, 80% of Hoosiers are not eating the recommended minimum five servings of fruits and vegetables to lower their colorectal cancer risks. Research suggests that aspirin-like drugs, post-menopausal hormones, folic acid, calcium supplements, selenium, and vitamin E may help prevent colorectal cancer. Because the effectiveness, appropriate dosages, and potential toxicities of supplements need to be better understood, the American Cancer Society does not include these in current guidelines and recommendations.

Colorectal cancer can almost always be cured if it is detected early. Screening tests can detect colon polyps (tissue growths) before they become cancerous, as well as early-stage colorectal cancers. Therefore, it is important for all adults aged 50 and older at average risk to follow the screening guidelines outlined in Table 13 on page 30 . Individuals with a family history of colorectal cancer or adenomatous polyps in a first degree relative (in a parent or sibling before age 60 or in two first-degree relatives of any age); a personal history of colorectal cancer, polyps, or chronic inflammatory bowel disease; or a family history of hereditary colorectal cancer syndrome should consider screening prior to age 50. However, 75% of colorectal cancer occurs in people over age 50 with no predisposing risk factors. Figure 9 displays the trend in prevalence of having a sigmoidoscopy or colonoscopy reported by Hoosiers aged 50 and older. While we are making progress, only 45% of Indiana adults ages 50 and over reported ever having had sigmoidoscopy or colonoscopy in 2001.

Signs and Symptoms of Colorectal Cancer:

- Bleeding from rectum
- Blood in stool or in the toilet after a bowel movement
- A change in the shape of stool
- Cramping pain in lower stomach
- A feeling of discomfort or an urge to have a bowel movement when there is no need to have one

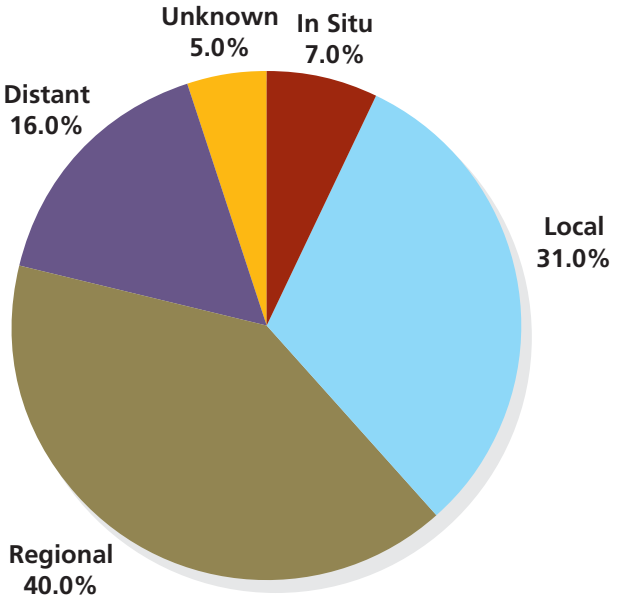
Cancer Burden

Colorectal cancer mortality has declined 27% in Indiana over the past two decades. From 1996 to 2000, a yearly average of 3,538 Hoosiers developed colorectal cancer and 1,494 Hoosiers died of the disease. Mortality rates have dropped from 31.4 per 100,000 in 1976 to 22.8 per 100,000 in 2000. Increased use of sigmoidoscopy or colonoscopy, which in turn has increased benign polyp removal, has been suggested as the potential reason for the decline in mortality rates. Other possible contributors to reducing colorectal cancer mortality are dietary changes (including increased calcium intake) and increased use of aspirin to prevent heart disease.

Stages at Diagnosis

Survival from colorectal cancer is more than 90% when the cancer is diagnosed before it has extended beyond the intestinal wall. In 2000, about 40% of colorectal cancers diagnosed in Indiana were early stage, compared to 75% for prostate and 69% for breast cancer. Figure 8 displays average stage at diagnosis for colorectal cancer. The American Cancer Society's goal is to prevent cancer; however, when cancer is not prevented, the goal is to detect the cancer as early as possible, when it is most treatable.

Figure 8. Colorectal Cancer Average Stage At Diagnosis, 1996-2000

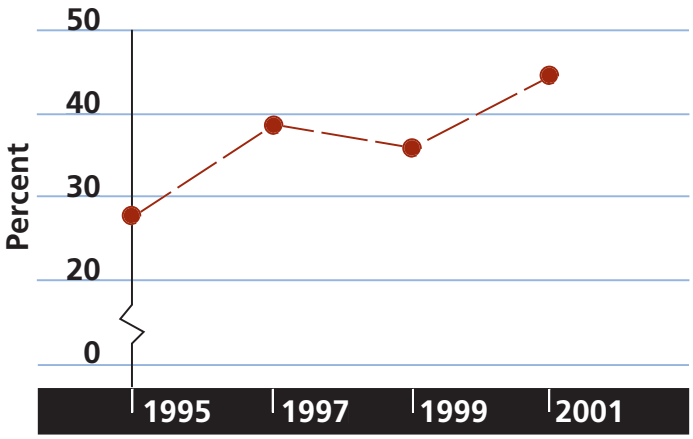


Source: Indiana State Department of Health - Indiana State Cancer Registry and the Epidemiology Resource Center, Data Analysis Team, May 2003.

Reduce your colon cancer risk by:

- ***Following screening guidelines***
- ***Eating a low-fat, high fiber diet***
- ***increasing your physical activity***

Figure 9. Ever had a Sigmoidoscopy or Colonoscopy, 50+



1. Source: Indiana Behavioral Risk Factor Surveillance System, Indiana Department of Health, 2003.
2. The weighted percentage was adjusted to: 1) probability of selection, i.e. the number of different phone numbers that reach the household, the number of adults in each household, and the number of completed interviews in each cluster; and 2) demographic distribution, i.e. age and gender.
3. "Don't Know" and "Refused" were excluded from the denominator.
4. In 1999 and 2001, the question asked if person had ever had a sigmoidoscopy or colonoscopy exam. Colorectal screening questions were not asked in 1996, 1998, and 2000.

Table 8. Colorectal Cancer Average Incidence And Mortality, 1996-2000

	INCIDENCE			MORTALITY		
	Female	Male	Total	Female	Male	Total
All Races	**48.4**	**67.2**	**56.1**	**19.9**	**28.1**	**23.2**
White	48	66.7	55.7	19.3	27.3	22.5
African American	53.8	73.2	61.7	29.7	41.1	34.2

Source: Indiana State Department of Health - Indiana State Cancer Registry and the Epidemiology Resource Center, Data Analysis Team, May 2003.
Rates are per 100,000 population and age-adjusted to the 2000 U.S. Population standard.

Lung and Bronchus Cancer/Tobacco Control

Bottom Line

Stopping tobacco use can nearly eliminate lung cancer, although 27% of Hoosier adults and 32% of Indiana's high school students continue to smoke. Until tobacco use ends, lung cancer will continue to be the number one cause of cancer deaths in the United States, killing more than 151,000 Americans every year, 4,000 of those being Hoosier deaths.

Risk Factors

- Cigarette smoking, as tobacco use is responsible for 87% of lung cancers. Lung cancer mortality rates are about 23 times higher for current male smokers and 13 times higher for current female smokers compared to people who have never smoked.
- Exposure to secondhand tobacco smoke.
- A first-degree relative who has had lung cancer.
- Age, as lung cancer is fairly rare in people under the age of 40.
- Tuberculosis (TB) and some types of pneumonia.
- Exposure to cancer-causing agents such as asbestos, radon, arsenic, talc, vinyl chloride, coal products, and radioactive ores like uranium. If people who are exposed to these agents also smoke, their risk is greatly increased.

Prevention/Screening/Early Detection

For lung cancer, early detection has not been shown to improve survival rates. Identifying an effective screening method is the key to improving early detection of lung cancer. Chest x-ray, analysis of cells contained in sputum, and fiber optic examination of the bronchial passages have all shown limited effectiveness in detecting lung cancer early.

Cancer Burden

Like most cancers, lung cancer occurs more frequently among older people. However, people of all ages, even children as early as middle school, become tobacco users. These current smokers comprise a large part of the at-risk population for eventually developing lung cancer.

Nationally, the 1995-1999 incidence rate for men averaged 86 per 100,000. In Indiana men, lung cancer incidence rates are much higher — 103.8 per 100,000 from 1996 – 2000 (Table 9). The national incidence rate for women during the 1995-1999 time period was 51.4 per 100,000. The Indiana incidence rate for women during the 1996-2000 time periods was 54.4 per 100,000. For the past 15 years, more women have died each year of lung cancer than breast cancer.

Lung cancer is the leading cause of cancer mortality in Indiana, killing an average of 3,800 Hoosiers per year between 1996 and 2000. In 2003, 4,400 new cases of lung cancer are expected in Indiana. Between 1996 and 2000, an average of 4,400 new cases of lung cancer was diagnosed each year.

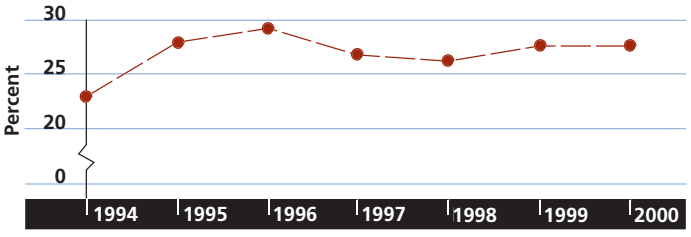
Gender and race also are factors in lung cancer incidence and mortality rates. Lung cancer mortality rates are significantly higher (51% higher) in Indiana males than in Indiana females (Table 9). Indiana males develop an average of 2,500 new cases of lung cancer each year, compared to an average of 1,900 new cases in Indiana females. In any given week, approximately 85 Hoosiers are diagnosed and about 75 Hoosiers die from lung cancer. Lung cancer causes more deaths every year than colorectal, breast, and prostate cancers combined.

Table 9. Lung Cancer Average Incidence And Mortality, 1996-2000

	INCIDENCE			MORTALITY		
	Female	Male	Total	Female	Male	Total
All Races	**54.4**	**103.8**	**74.8**	**45.5**	**93.4**	**65**
White	53.9	102.6	74.1	45.1	92.2	64.3
African American	61.8	122.6	86.1	52.5	117.7	78

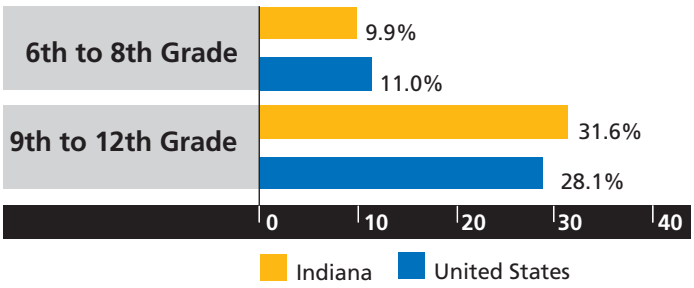
Source: Indiana State Department of Health - Indiana State Cancer Registry and the Epidemiology Resource Center, Data Analysis Team, May 2003.
Rates are per 100,000 population and age-adjusted to the 2000 U.S. Population standard.

Figure 10. Adult Smoking Prevalence Rates



Source: Indiana Behavioral Risk Factor Surveillance System, Indiana Department of Health, 2003.

Figure 11. Youth Smoking



Source: 2000 Indiana Youth Tobacco Survery was conducted by SmokeFree Indiana, 2000 National Youth Tobacco Survey was conducted by American Legacy Foundation Prevalence.

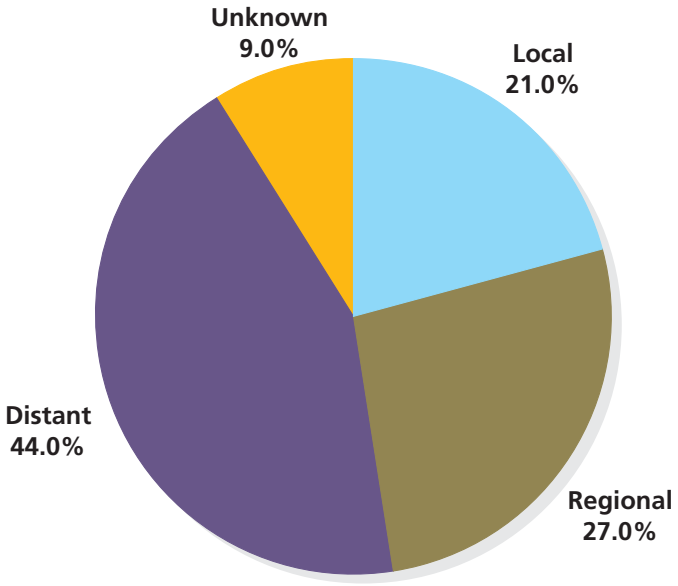
Stages at Diagnosis

Lung cancer is often diagnosed at a later stage, which negatively impacts odds of survival (Figure 12). Five-year probability of survival is highest if lung cancer is diagnosed early, with a 48% five-year survival rate for lung cancers diagnosed at the local stage. However, only 21% of lung cancers in Indiana were diagnosed at the local stage between 1996 and 2000.

Tobacco Use

Smoking is the single most preventable cause of death. In 1995, two million people in developed countries died prematurely from smoking-related diseases. Tobacco use kills more people than alcohol, HIV/AIDS, car accidents, illegal drugs, murders and suicides, combined. In Indiana, 10,300 Hoosiers die from smoking-related diseases each year. One-third of those deaths are due to lung cancers. This large number of deaths is due to Indiana's high smoking rates.

Figure 12. Lung Cancer Average Stage At Diagnosis, 1996-2000



Source: Indiana State Department of Health - Indiana State Cancer Registry and the Epidemiology Resource Center, Data Analysis Team, March 2003.

Adult prevalence: Indiana ranks fifth in the country with 27% of adults being smokers, compared to 23% in the U.S. (Figure 10). Indiana consistently is in the list of states with the highest smoking rates. More than 1.2 million adults in Indiana smoke cigarettes, including 29% of all men and 27% of all women. Smoking rates among women continue to rise. Smoking rates in Indiana vary slightly among race/ethnic groups. Smoking prevalence among Hispanics/Latinos is lower than among whites and African Americans (21% vs. 28%, respectively). One-third of adults aged 34 and younger report current smoking. Smoking rates decline as age increases.

One of the most striking relationships is between smoking and education level. More than 40% of those with less than a high school education report current smoking behavior. As educational level increases, smoking prevalence among Hoosiers decreases.

Youth Prevalence: Cigarette use among 9th to 12th grade Indiana youth, similar to Indiana adults, is higher than the national average (Figure 11). If current smoking trends continue, 167,000 Indiana youth under age 18 eventually will die from tobacco use.

Approximately 37% of Indiana high school (9th to 12th grades) and 15% of middle school (6th to 9th grades) students currently use some form of tobacco. A majority of this use is cigarettes, with approximately 32% of Indiana high school and 10% of middle school students reporting current cigarette use, compared to 28% in the U.S. Smoking prevalence for middle school Indiana youth are similar to the rest of the U.S.

Tobacco use among youth is shocking, considering it is illegal in Indiana to sell tobacco products to anyone under the age of 18. However, an estimated 22.4 million packs of cigarettes each year are sold to or smoked by teenagers and children in Indiana. *(DiFranza and Librett, 1999; Cummings et al, 1994.)* Access to tobacco results in 19,600 Hoosier youth becoming daily smokers each year. This translates to 53 Hoosier youths each day or two children each hour.

If children and youth can be prevented from starting to smoke, a substantial portion of tobacco-related health problems can be avoided.

Pregnant women: Smoking can impact the lives of even the youngest Hoosiers. Approximately 20% of women in Indiana smoked during pregnancy in 1999 and 2001. *(Indiana State Department of Health.)* Smoking during pregnancy is associated with poor health outcomes, such as low birth weight, growth retardation, spontaneous abortions and Sudden Infant Death Syndrome (SIDS). In 1999, Indiana was one of four states where more than 20% of women smoked during pregnancy. The number of Indiana women who reported smoking during pregnancy was nearly double the national average. County smoking rates vary from 6% to 37%, with all but two Indiana counties having higher smoking rates during pregnancy than the national average.

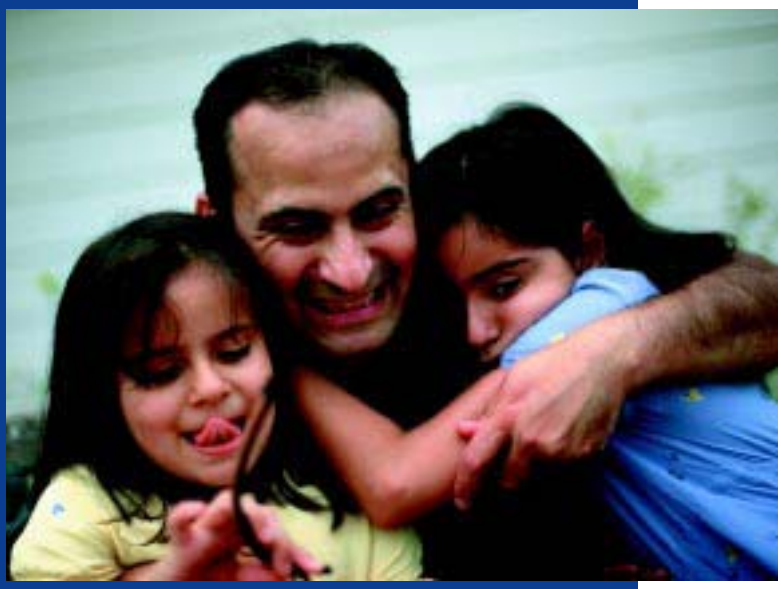
Other Tobacco Use

Other tobacco includes smokeless tobacco, cigars, bidis and kreteks. Smokeless, or spit tobacco, can cause cancer of the lips, esophagus, throat, larynx, pancreas and stomach. These cancers can form within only five years of regular spit tobacco use. Users of spit tobacco are 50 times more likely to get oral cancer than non-users. Holding one pinch of spit tobacco in your mouth for 30 minutes gives the same amount of nicotine as smoking four cigarettes. Cigar smoking has been found to cause cancers of the larynx, oral cavity (lip, tongue, mouth, and throat), esophagus, and lung. Tobacco use also is a significant risk factor for several other cancers, including cancer of the stomach, pancreas, kidney, bladder, cervix, and possibly the liver. In addition to cancer, smoking is a major cause of heart disease, stroke, chronic bronchitis, and emphysema. Along with cancers, heart disease, stroke and chronic respiratory diseases are the leading causes of death to Hoosiers.

Currently little information is known about the prevalence of other tobacco use in Indiana. In 1998, 15% of Hoosier adults reported using smokeless tobacco. According to the 2000 Indiana Youth Tobacco Survey (YTS), Hoosier youth at the middle school level use more smokeless tobacco and bidis than in the rest of the country, while use rates are slightly lower than the U.S. for cigarette, cigar and pipe smoking. Once youth reach high school, tobacco use for all products increases significantly and surpass or equal use rates for the U.S. In addition, 5% of middle school and 15% of high school students regularly smoke cigars and 4% of middle school and 7% of high school students use smokeless tobacco.

Groups at High Risk for Smoking

- Males are 53% more likely than females to be current smokers. *(Indiana Adult Tobacco Survey, 2002.)*
- Hispanics/Latinos are 68% less likely than Whites to be current smokers. *(Indiana Adult Tobacco Survey, 2002.)*
- Individuals who live with smokers are more than 15 times more likely to smoke than individuals who do not live with smokers.
- Unmarried or separated adults are more than three times more likely to smoke than those who are married.



Secondhand Smoke

Nationally, each year, secondhand smoke is responsible for as many as 53,000 deaths, including about 3,000 deaths of nonsmoking adults due to lung cancer. Approximately 930 to 1,650 deaths occur to Hoosiers due to others' smoking, including secondhand smoke and pregnant women smoking. *(U.S. Department of Health and Human Services, August 1999.)* In 1992, the U.S. Environmental Protection Agency declared that secondhand smoke, or environmental tobacco smoke (ETS), causes cancer in humans. Secondhand smoke contains over 4,000 substances, more than 40 of which are known or suspected to cause cancer in humans and animals.

Secondhand smoke is responsible for many childhood illnesses, including sudden infant death syndrome (SIDS), respiratory problems, chronic ear infections, and aggravation of asthma. Every day more than 15 million children are exposed to ETS in the home. *(MMWR, 46 (44)).* Millions of doctor visits and thousands of hospitalizations occur due to children's exposure to secondhand smoke.

Children are affected more by secondhand smoke than adults because their bodies are still developing and smoke can hinder the growth and function of their lungs. Hundreds of thousands of lung and bronchial infections are caused by secondhand smoke each year. Children and infants exposed to secondhand in the home have dramatically higher levels of respiratory symptoms and respiratory tract infections. Children of parents who smoke have an increased number of respiratory infections and symptoms and slower lung development. Almost half of Hoosier youth live with someone who smokes cigarettes. More than half of middle school and 75% of high school students reported being in the same room as someone who was smoking cigarettes in the past 7 days. *(Indiana Youth Tobacco Survey, 2000.)*

Cessation

The best way to avoid developing lung cancer is to not start using tobacco or to quit if you do use it. Quitting tobacco use substantially decreases the risk of cancer and cardiovascular disease. Smokers who quit, regardless of age, live longer than people who continue to smoke. Once smoking rates begin to decline in a population, it takes 20-30 years to see a decline in lung cancer rates.

A majority of Hoosier smokers say they plan to quit sometime (86%), with 62% of current smokers planning to quit in the next six months. In the past year, half of adult smokers tried to quit but only 10% were successful. While cessation counseling and nicotine replacement therapy can help smokers quit, only 25% of those who tried to quit used these aids.

Quitting can be a tremendous challenge. For those successful at quitting, the risk of lung cancer decreases over time. After ten years of being smoke-free, the lung cancer risk is half that of a current smoker. Strategies that assist people to quit smoking, reduce secondhand smoke exposure, or prevent youth initiation of cigarette smoking are crucial parts of making a difference in tobacco-related cancer incidence.

Factors that were successful in quitting smoking include:

- Beliefs that secondhand smoke was harmful and caused lung cancer. Smokers that believed secondhand smoke causes lung cancer were twice as likely to successful in quitting.
- Those with rules prohibiting smoking in the home were almost twice as likely to successfully quit compared to those without such rules.

Melanoma/Skin Cancer

Bottom Line

Nearly all skin cancers are preventable by limiting unprotected exposure to the sun. When they do occur, most skin cancers can be treated successfully if detected early — even melanoma, the most serious type of skin cancer. In addition to recommending that people seek shade and wear wrap around sunglasses, the American Cancer Society recommends the "Slip!, Slop!, Slap! and Wrap!" method of prevention — *Slip* on a shirt, *Slop* on SPF 15 (or higher) sunscreen, *Slap* on a hat before any exposure to the sun, and *Wrap* on a pair of sunglasses.

Risk Factors

Several risk factors may contribute to the development of skin cancer. They include:

- Excessive exposure to ultraviolet radiation from sunlight or tanning lamps
- History of sunburns early in life
- Fair to light skin complexion (freckles are an indicator of sun sensitivity and skin damage)
- Gender (men are more likely to develop skin cancer than women)
- Age (over 50% of all melanomas occur in people over the age of 50)
- Race (risk of melanoma is more than 20 times higher for whites than for African Americans)
- Occupational exposure to coal tar, pitch, creosote, arsenic compounds, or radium
- Family history (numerous moles, as well as certain types of high risk moles, often run in families and may indicate high risk for melanoma; risk of melanoma is greater if one or more close relatives have been diagnosed with melanoma)
- Multiple or atypical nevi (moles)

Prevention/Screening/Early Detection

The American Cancer Society recommends the following for the prevention of skin cancer:

- Limit or avoid exposure to the sun during the midday hours (10 a.m. - 4 p.m.).
- When outdoors, wear a hat that shades the face, neck, and ears, and a long-sleeved shirt and long pants. Wear sunglasses to protect the skin around the eyes.

- Use a sunscreen with a sun protection factor (SPF) of 15 or higher.
- Because severe sunburns in childhood may greatly increase risk of melanoma in later life, children, in particular, should be protected from the sun.

Recognition of changes in skin growths or the appearance of new growths is the best way to find early skin cancer. Adults should practice skin self-examination regularly. Suspicious lesions should be evaluated promptly by a physician. Basal and squamous cell skin cancers often take the form of a pale, wax like, pearly nodule, or a red, scaly, sharply outlined patch. A sudden or progressive change in a lesion's appearance should be checked by a physician. Melanomas often start as small, mole-like growths that increase in size and change color. A simple ABCD rule outlines the warning signals of melanoma:

A is for asymmetry: one half of the mole does not match the other half;

B is for border irregularity: the edges are ragged, notched, or blurred;

C is for color: the pigmentation is not uniform, with variable degrees of tan, brown, or black;

D is for diameter greater than 6 millimeters. Any sudden or progressive increase in size should be of concern.

Cancer Burden

In 2000, 1,029 Hoosiers were diagnosed with and 191 Hoosiers died of malignant melanoma. Approximately 60% of the deaths occurred in men and 40% of the deaths occurred in women. Due to low reporting for this cancer site, the reader must use caution when analyzing the incidence data for skin cancer. The most serious form of skin cancer is melanoma, which is expected to be diagnosed in about 1,400 persons in 2003. During the 1970s, the incidence rate of melanoma increased rapidly at about 6% per year. Since 1981, however, the rate of increase slowed to a little less than 3% per year. Melanoma is primarily a disease of whites, and rates are more than 10 times higher in whites than in African Americans. Melanoma mortality for the more recent period is increasing less rapidly in white men, while it has stabilized among white women. Other important forms of skin cancer include Kaposi sarcoma, which commonly occurred among patients with AIDS prior to the introduction of protease inhibitors, and cutaneous T-cell lymphoma.

Signs and Symptoms of Skin Cancer

Key warning signs of non-melanoma skin cancers are: a new growth, a spot that is getting larger, or a sore place that does not heal within three months; any change on the skin, especially in the size or color of a mole or other darkly pigmented growth or spot; scaliness, oozing, bleeding, or change in the appearance of a bump or a nodule; the spread of pigmentation beyond its border; and a change in sensation, itchiness, tenderness, or pain.

Stages at Diagnosis

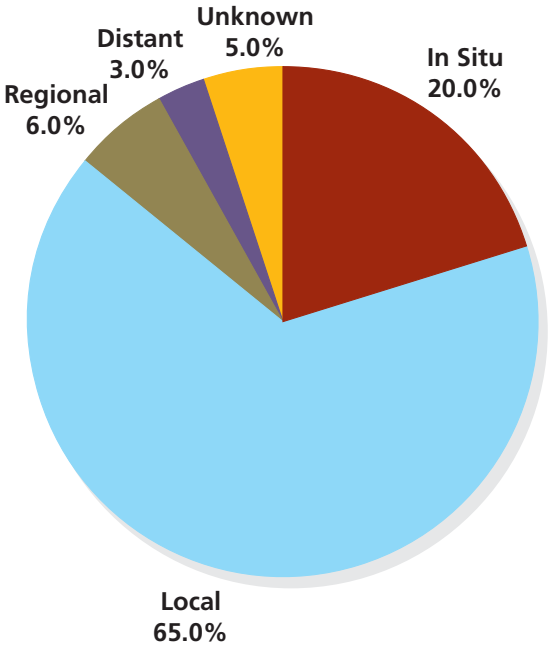
Basal cell or squamous cell cancers (non-melanoma skin cancers) are highly curable if detected and treated early. Melanoma can spread to other body parts quickly, but it too can be cured if detected early. The five-year survival rate nationally for patients with melanoma is 89%. For localized melanoma, the five-year survival rate is 96% nationally, with about 82% of melanomas diagnosed at the local stage. In Indiana, 85% are diagnosed at or before the local stage (Figure 13).

Table 10. Melanoma Average Incidence And Mortality, 1996-2000

	INCIDENCE			MORTALITY		
	Female	Male	Total	Female	Male	Total
All Races	9.8	15.4	12.1	1.9	4.1	2.8

Source: Indiana State Department of Health - Indiana State Cancer Registry and the Epidemiology Resource Center, Data Analysis Team, May 2003.
Rates are per 100,000 population and age-adjusted to the 2000 U.S. Population standard.

Figure 13. Melanoma Average Stage At Diagnosis, 1996-2000



Source: Indiana State Department of Health - Indiana State Cancer Registry and the Epidemiology Resource Center, Data Analysis Team, March 2003.

American Cancer Society recommends

"Slip!, Slop!, Slap! and Wrap!"

Method of Prevention

Slip on a shirt, Slop on SPF 15 (or higher) sunscreen, Slap on a hat before any exposure to the sun, and Wrap on a pair of sunglasses!

Prostate Cancer

Bottom Line

Prostate cancer is the most commonly diagnosed cancer in Hoosier men, and it is the second leading cause of cancer deaths for these men. Age is the principal risk for prostate cancer, and discovering the cancer earlier increases patient survival and treatment options. All men 50 years and older should talk to their physicians about having annual Digital Rectal Exams (DRE) and Prostate-Specific Antigen (PSA) tests to help detect prostate cancer early. Further, men should discuss an abnormal DRE or PSA with their physicians in order to determine the optimal course of action, especially since it is not clear if all men need to be treated immediately for prostate cancer.

Risk Factors

Although the actual causes of prostate cancer are not yet clear, several risk factors may be linked to its development. They include:

- Age (more than 75% of all prostate cancers are diagnosed in men over 65)
- Race (death rates from prostate cancer for African-American men are more than twice that of white men)
- Family History (individuals with a family history of prostate cancer experience a 2.5 fold increase in risk; 5% to 10% of prostate cancers may be inherited)
- Nutrition (there is significant evidence indicating that a high-fat diet is linked to increased cancer risk)

Prevention/Screening/Early Detection

Although risk factors for prostate cancer such age, race, and family history are not modifiable, there are lifestyle strategies that individuals can adopt that may reduce their risk. Since a high-fat diet may be linked to increased rates of prostate cancer, a diet low in animal fat while high in vegetables, fruits, and whole grains is suggested. Additionally, studies suggest that people who eat more vegetables and fruits, which are rich food sources of antioxidants, may have a lower risk for some types of cancer.

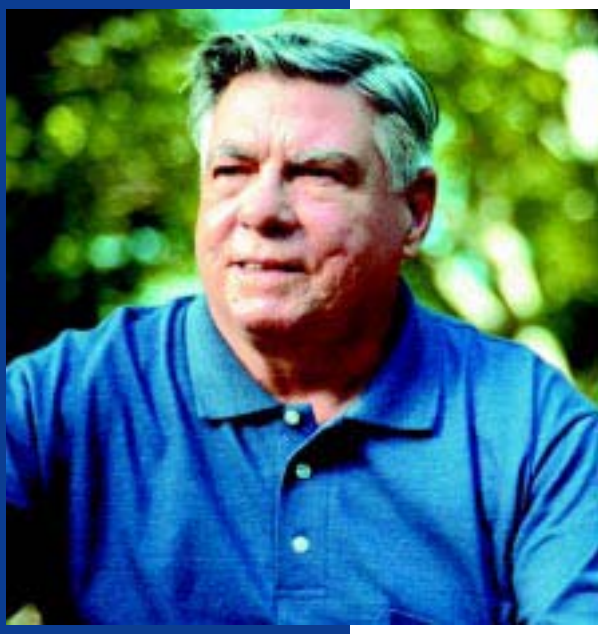
As stated previously, the precise cause of prostate cancer is not known; therefore, early detection may offer men with prostate cancer the greatest opportunity for full recovery. However, unlike breast cancer where clinical trials have clearly demonstrated a decrease in mortality following screening, such a clear relationship does not exist for prostate cancer. Prostate cancer can be very slow or fast growing, and therefore the treatment approach must be individualized. Depending on the specific situation, patients and their physicians may choose "watchful waiting" or a more aggressive treatment approach. Patients should be made aware of the potential benefits and risks of early detection and treatment, and should discuss them thoroughly with their physician.

The Prostate-Specific Antigen (PSA) and the Digital Rectal Exam (DRE) are the two primary methods used to screen for prostate cancer. The PSA test and the DRE are recommended annually for men beginning at age 50. Men at high risk (African-American men and men who have a first-degree relative diagnosed with prostate cancer at a young age) should begin testing at age 45.

The PSA test measures blood levels of a protein made by the prostate. The higher the PSA level, the more likely that prostate cancer is present. The PSA test alone does not provide a definitive diagnosis "for" or "against" prostate cancer. The digital rectal exam, or DRE, allows a physician to feel for any irregular or abnormally firm area on the prostate that might be cancer. While it is uncomfortable, the exam isn't painful and takes only a short time. Again, the PSA and DRE are screening tools, and patients with a high PSA result or an abnormal DRE exam are usually advised to have a repeat PSA test, trans-rectal ultrasound, or a biopsy to determine if cancer is present.

Cancer Burden

There were 3,462 prostate cancer cases in Indiana in the year 2000. Prostate cancer accounted for just over 24% of all cancer cases in Indiana men between 1996 and the year 2000. Further, the Indiana incidence rate (new cases per 100,000 men) for prostate cancer was 134.5 in the year 2000 (170.2 for U.S.). Prostate cancer deaths make up approximately 11% of all cancer deaths in Indiana men. There were 3,580 deaths from prostate cancer in Indiana from 1996 to 2000, an average of 716 deaths each year. When viewed as a rate, there were 30.6 deaths per 100,000 men in Indiana due to prostate cancer in 2000 (31.1 per 100,000 in U.S.). African American men in Indiana experience a significantly greater prostate cancer burden than other men in the state when compared to Hoosier white men, whose incidence and mortality rates averaged 119.6 and 32.0 per 100,000 respectively from 1996-2000, average incidence and



mortality rates in African-American men were 207.4 and 78.8 per 100,000. Such significant disparity, particularly mortality, may be due to several factors including late diagnosis, waiting too long to receive treatment after being diagnosed, inappropriate treatment, more aggressive tumors, and overall health. This disparity is also seen nationally.

Stages at Diagnosis

The stage of cancer at diagnosis refers to how much the cancer has grown or spread. As mentioned previously, detecting prostate cancer earlier (earlier stage) can lead to a higher survival rate. From 1996-2000, 85% of Indiana men diagnosed with prostate cancers were diagnosed in the local and regional stages (Figure 14). When considering race, 86% of white men diagnosed with prostate cancer were diagnosed at a local or regional stage, compared to 81% of African Americans.

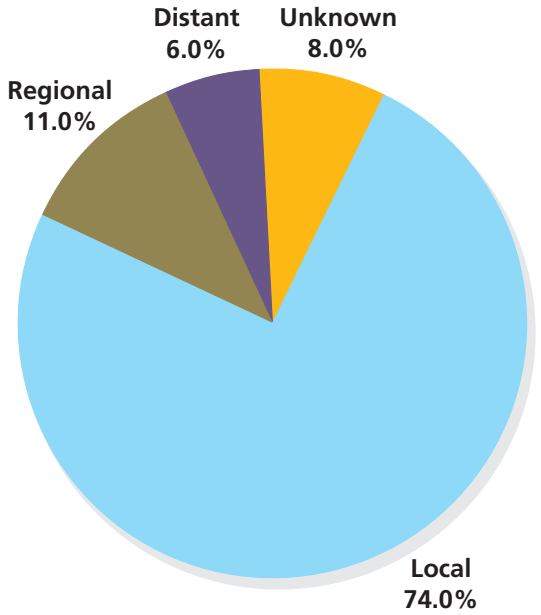
Table 11. Prostate Cancer Average Incidence And Mortality, 1996-2000

	INCIDENCE	MORTALITY
	Male	Male
All Races	**125.6**	**34.5**
White	119.6	32
African American	207.4	78.8

Source: Indiana State Department of Health - Indiana State Cancer Registry and the Epidemiology Resource Center, Data Analysis Team, May 2003.
Rates are per 100,000 population and age-adjusted to the 2000 U.S. Population standard.

Additionally, 5% of white men and 10% of African American men were diagnosed at the distant stage, a stage where prognosis is generally less positive.

Figure 14. Prostate Cancer Average Stage At Diagnosis, 1996-2000



Source: Indiana State Department of Health - Indiana State Cancer Registry and the Epidemiology Resource Center, Data Analysis Team, March 2003.

Prostate cancer is the most commonly diagnosed cancer in Hoosier men, and it is the second leading cause of cancer deaths for these men. Age is the principal risk for prostate cancer, and discovering the cancer earlier increases patient survival and treatment options.

Testicular Cancer

Bottom Line

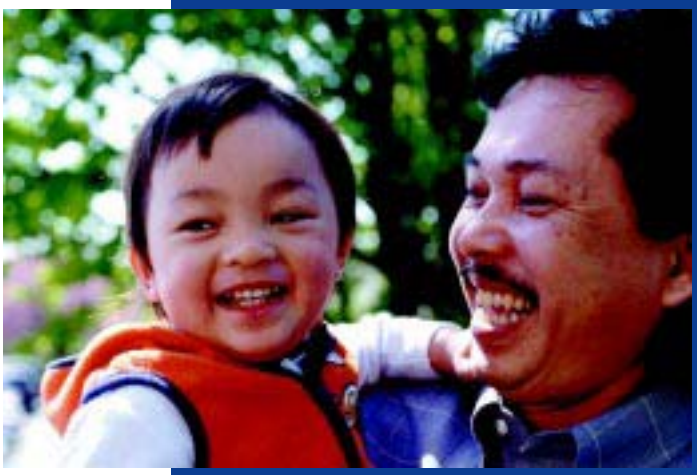
Testicular cancer is a highly treatable and usually curable form of cancer. Studies show that the cure rate exceeds 90% in all stages combined. The 5-year survival rate for stage I and stage II testicle cancer is more than 95%. The testicles contain several types of cells, each of which may develop into one or more types of cancer.

- **Germ Cell Tumors:** Over 90% of cancers of the testicle develop in certain cells known as germ cells.
- **Seminoma:** About half of all testicle germ cell cancers are seminomas. They develop from the sperm-producing germ cells of the testicle.
- **Nonseminoma Germ Cell Cancer:** These cancers tend to develop earlier in life than seminomas, usually occurring in men in their 20s.

Risk Factors

Several risk factors may contribute to the development of testicular cancer. They include:

- Age (Most testicular cancers occur between the ages of 15 and 40.)
- Race and Ethnicity (The risk of testicular cancer among white American men is about five times that of African-American men and more than double that of Asian-American men. The risk for Hispanics is intermediate between that of Asians and non-Hispanic whites.)
- Cryptorchidism (The main risk factor for testicular cancer is a condition called cryptorchidism, or undescended testicle(s). In about 3% of boys the testicles do not descend properly. About 14% of cases of testicular cancer occur in men with a history of cryptorchidism.)
- Family History (A family history of testicular cancer increases the risk.)
- HIV Infection (There is some evidence that men infected with the human immunodeficiency virus (HIV), particularly those with AIDS, are at increased risk.)
- Carcinoma in Situ (This condition does not produce a mass or cause any symptoms. Carcinoma in situ (CIS) in the testicles almost always progresses to cancer.)



Prevention/Screening/Early Detection

The main known risk factors for testicular cancer (cryptorchidism, white race, and a family history of the disease) are unavoidable because they are present at birth. Also, many men with testicular cancer have no known risk factors. For these reasons, it is not currently possible to prevent most cases of this disease.

Most cases of testicular cancer can be found at an early stage. In about 90% of cases, men have a painless or an uncomfortable lump on a testicle, or they may notice testicular enlargement or swelling. If individuals have any of the signs or symptoms described above, they should discuss them with their physicians without delay. Earlier diagnosis will likely lead to a more positive outcome.

The issue of regular testicular self-examination is more controversial. Some physicians feel that delay in seeking medical attention after discovering a mass is the most common reason for a delay in treatment. Other medical professionals feel that not noticing masses promptly is also an important factor in delaying treatment, and therefore recommend monthly testicular self-examination by all men after puberty. Because men with certain risk factors (cryptorchidism, previous germ cell tumor on one side or a family history) have an increased risk of developing testicular cancer, monthly examinations should be seriously considered for these men and the ACS suggests they discuss this issue with their doctor.

Identifying testicular cancers depends upon many potential tools: self-exam, physical exam by a physician, ultrasound, blood tests, biopsies, and surgery. Further, the three main methods of treatment for testicular cancer are surgery, radiation therapy, and chemotherapy.

Cancer Burden

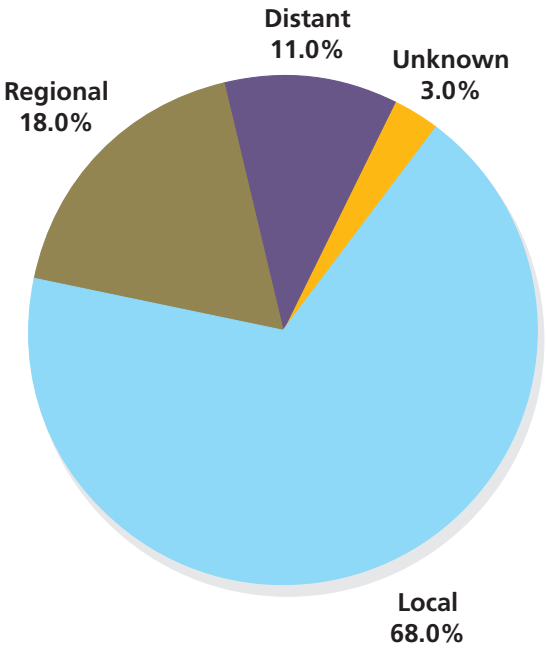
Testicular cancer incidence is relatively low in Indiana, accounting for just over 1% of all cancer cases in Hoosier men between 1996 and the year 2000 (Table 12). Further, the average incidence rate (new cases per 100,000 men) of testicular cancer was 5.1 per 100,000 for the same 5-year period and 5.4 per 100,000 in the year 2000. Testicular cancer deaths make up less than 0.1% of all cancer deaths in Indiana men (Table 12). There were 30 deaths from testicular cancer in Indiana from 1996 to 2000. Because testicular cancer mortality in Indiana is low, the rate is statistically unreliable.

Table 12. Testicular Cancer Average Incidence And Mortality, 1996-2000

	INCIDENCE	MORTALITY
	Male	Male
All Races	**5.1**	**0.2**
White	5.4	0.2
African American	1.1	0.2

Source: Indiana State Department of Health - Indiana State Cancer Registry and the Epidemiology Resource Center, Data Analysis Team, May 2003.
Rates are per 100,000 population and age-adjusted to the 2000 U.S. Population standard.

Figure 15. Testicular Cancer Average Stage At Diagnosis, 1996-2000



Source: Indiana State Department of Health - Indiana State Cancer Registry and the Epidemiology Resource Center, Data Analysis Team, March 2003.

Cancer in Diverse Populations

Cancer affects individuals of all racial and ethnic groups. Over one million new cancer cases will be diagnosed in the United States in 2003, including more than 30,000 in Indiana. An estimated 556,500 Americans were expected to die of the disease in 2003 of which 13,000 will be Hoosiers. In 2000, the all-sites cancer incidence rate for Indiana's African American population, 484.5 per 100,000, was higher than the rate for the white population 447.0 per 100,000.

A close look at cancer rates for racial and ethnic groups reveals some significant differences. Such differences have been described as health disparities. Health disparities are the differences in the incidence, prevalence, mortality and burden of cancer and related adverse health conditions that exist among specific populations in the United States.

Many differences in cancer incidence and mortality rates among racial and ethnic groups may be due to factors highlighted on this page. According to the Institute of Medicine's recent publication, *Unequal Treatment: Confronting Racial and Ethnic Disparities in Health Care*, variables such as socioeconomic class, differences in risk factors, environmental conditions, racial discrimination and reduced access to appropriate medical testing and treatment must also be considered (IOM, 2002). Religious and cultural beliefs also play a key role in the attitudes toward health and associated behaviors of any given population.

Population groups may be characterized by:

- **Gender**
- **Education**
- **Disability**
- **Age**
- **Income**
- **Geographic Location**
- **Ethnicity**
- **Social Class**
- **Sexual Orientation**

Cancer incidence and mortality rates for African Americans exceed those of whites and other ethnic groups. Hispanics/Latinos generally have lower cancer rates than their white and African American counterparts for the leading cancers: lung, colorectal, breast and prostate.

Breast and Cervical Cancer

Breast Cancer

African American: Breast cancer is the second leading cause of cancer death among African American women, exceeded only by lung cancer in Indiana. Despite the stabilization of rates, cancer mortality among African American women is still higher than white women in the U.S. Although a higher percentage of white women in the U.S. are diagnosed with breast cancer, a higher percentage of African American women die of breast cancer. African Americans have lower survival rates (less than 5 years) post treatment.

Hispanic/Latina: Even though Hispanic/Latina women have lower rates of breast cancer 69.8 per 100,000 compared to non-Hispanic/Latina women of African American women 111.8 per 100,000 and 95.4 per 100,000 respectively, breast cancer is the leading cause of cancer death among Hispanic/Latina women. The five-year survival rate for non-Hispanic/Latina women with breast cancer is 85% while for Hispanic/Latina women it is 76%.

Cervical Cancer

African American: Minorities including African Americans have a higher risk of developing cervical cancer than whites. Much of the difference can be explained by socioeconomic factors and associated risk factors. A large proportion of women, particularly elderly African American women and middle-aged poor women, do not have regular Pap tests. Even though they do not have the highest incidence of cervical cancer, African American women have the highest risk for dying from cervical cancer. After the age of 25, the incidence of invasive cervical cancer in African American women increases rapidly with age.

Hispanic/Latina: Cervical cancer risk is high among Hispanics/Latinas, with incidence rates that are double those of whites. Hispanics/Latinas experienced the highest invasive cervical cancer incidence rates, 15.3 per 100,000, of any group other than Vietnamese and twice the incidence rates of non-Hispanic/Latina white women, 7.1 per 100,000. This risk differential has not appreciably improved over the last decades. Cervical cancer mortality is also markedly higher among Hispanics/Latinas 3.4 per 100,000 as compared to 2.3 per 100,000 for non-Hispanic women.

Lung Cancer and Tobacco

In every ethnic group, men have higher lung cancer incidence and mortality rates than women. African American men have the highest lung cancer incidence and mortality rates. Among women, Alaskan Natives have the highest lung cancer incidence and mortality rates. Lung cancer is the leading cause of cancer death among men in all racial/ethnic groups except American Indians.

African American: Both incidence and mortality rates from lung cancer are higher among African American men than in whites in Indiana even though African Americans begin smoking at an older age and smoke fewer cigarettes per day. The incidence rate is greater among African Americans than in whites 82.0 per 100,000 versus 74.2 per 100,000. When lung cancer is diagnosed at the localized stage, the 5-year relative survival rate among all African Americans is 43%, but only 13% of lung cancer cases are detected at that stage.

Hispanic/Latino: Lung cancer deaths are about three times higher for Hispanic men 23.1 per 100,000 than for Hispanic/Latina women, 7.7 per 100,000. The Hispanic/Latino rate of lung cancer deaths per 100,000 in Indiana is 19.5. According to the CDC, over 20% of Hispanic/Latino adults smoke. Currently one quarter of youth smokers, 25.8% are Hispanics/Latinos compared to 32.8% white and 15.8% African Americans. Smoking prevalence is on the rise for Hispanic/Latina girls. Studies show that children with less education are more likely to smoke, which significantly impacts Hispanics/Latinos who have dropped out of school. In general, smoking rates among Hispanic/Latino adults increase as they are exposed to American marketing and culture.

Colon and Rectum Cancer

African American: Colorectal cancer is the third leading cause of cancer death among both African American men and women, higher than any other racial or ethnic group. An estimated 7,000 African Americans are expected to die from these types of cancers in 2003. Death rates for cancer of the colon and rectum among African Americans are about 30% higher than among White and more than twice as high than for Asian Americans, Pacific Islanders, American Indians and Hispanics.

Hispanic/Latino: Colorectal cancer is the second most common cancer in U.S. among Hispanic/Latino men and women. Hispanic/Latinos have a colorectal cancer incidence rate of 28.8/100,000. Between 1988 and 1991 Hispanic/Latino men had approximately one half the incidence of that of non-Hispanic men. Hispanic/Latina women also have lower rates, which are 20% to 40% less than non-Hispanic women. Additionally, both colorectal incidence and mortality rates have been declining for several years.

Prostate Cancer

African American: Although prostate cancer incidence rates are high in whites, the rate for African Americans is 60% higher. African American men in the U.S. have the highest incidence of prostate cancer in the world. Although mortality rates are declining among whites and African American men, rates in African American men remain more than twice as high as rates in white men.

Hispanic/Latino: Incidence rates for Puerto Ricans and Cuban Americans are similar to those of non-Hispanic white men. The frequency of prostate cancer is significantly lower in Hispanic/Latino. White-Hispanic/Latinos have the lowest five-year relative survival rates among patients with advanced disease. Mortality rates for White-Hispanics/Latinos have not decreased as they have for African Americans and White non-Hispanic/Latinos.

Table 13. Summary Information for Major Cancer Sites

	CANCER RISK FACTORS	RISK REDUCTION	EARLY DETECTION (Asymptomatic Persons)
FEMALE BREAST	Age; family history in mother or sisters; precancerous condition on breast biopsy; first child born after age 30; obesity; obesity in post-menopausal women never having had children; hormone replacement therapy; cancer genes have been identified.	Follow the American Cancer Society's nutrition guidelines; maintain normal weight; exercise three times or more per week.	Mammography; breast self-examinations; clinical breast examinations.
CERVIX	Papilloma virus infections; early age at first intercourse; multiple sexual partners; smoking; low socioeconomic status; poor compliance to screening programs or never having had screening.	Avoid early onset of sexual activity; practice safe sex; avoid numerous lifetime sexual partners; have regular Pap exams to detect precancers; avoid use of tobacco products.	Pap smear and pelvic examination.
COLON & RECTUM	Personal or family history of colorectal cancer; colorectal polyps; diets high in fat and low in fiber; inflammatory bowel disease.	Removal of polyps; follow the ACS nutrition guidelines for diets high in fiber and low in fats; recent studies suggest that drugs like aspirin may reduce risk.	Men and women at average risk begin regular screening for colorectal cancer at age 50; flexible sigmoidoscopy, stool blood test, colonoscopy, or double-contrast barium enema.
CORPUS UTERUS	Some forms of infertility; obesity; use of unopposed post-menopausal estrogens; diabetes.	When considering estrogen replacement therapy, benefits and risks must be considered by woman and her physician.	Pelvic exam; endometrial tissue sampling at menopause if high risk.
NON-HODGKIN'S LYMPHOMA	AIDS in some cases; transplantation and immuno-suppression therapy; viral causes have been suggested in some types; increased risk is associated with certain genetic diseases.	None known.	Health-related checkups may identify early signs and symptoms.
LEUKEMIA	Persons with genetic abnormalities such as Down Syndrome; ionizing radiation; exposure to certain chemicals, cytotoxic drugs; certain forms are related to retrovirus, HTLG-1.	Reduce exposure to radiation and hazardous chemicals.	Health-related checkups may identify early signs and symptoms.
LUNG & BRONCHUS	Tobacco use; voluntary and involuntary smoking; occupational exposure to hazardous substances such as asbestos; radon exposure.	Avoid tobacco products in all forms; stop smoking; avoid secondhand smoke; follow workplace safety practices; check home for radon.	Health-related checkups may identify early signs and symptoms.
MELANOMA (SKIN)	Fair skin; sun exposure; severe sunburn in childhood; familial conditions such as dysplastic nevous syndrome; large congenital moles.	Protect against sun exposure, especially in childhood; use protective clothing and sunscreens with SPF 15 or greater when exposed to the sun.	Annual skin examinations by an experienced physician; monthly self-exams.
OVARY	Increases with age; possible dietary factors; older women who have never had children; history of breast, endometrial, or colon cancer; family history; genes have been identified.	Pregnancy, breast feeding, using birth control pills for at least five years; eating a low-fat, high fiber diet; for women with a family history of ovarian cancer, having the ovaries and/or uterus removed or the fallopian tubes tied.	Health-related checkups may identify early signs and symptoms.
PROSTATE	Age is the most important risk factor: 80% of all prostate cancer occurs in men over age 65; dietary fat may play a role; higher in African Americans.	High-fat diets have been linked to prostate cancer; thus, ACS nutrition guidelines recommend eating a diet low in fat and high in vegetables, fruits, and grains.	Digital rectal examination; prostate-specific antigen (PSA).

WARNING SIGNS	TREATMENT	AMERICAN CANCER SOCIETY CANCER DETECTION GUIDELINES
Thickening; swelling; skin irritation or distortion; nipple symptoms–erosion, inversion, tenderness.	**Early stage —** mastectomy or local removal with radiation therapy. **Adjuvant therapy —** hormones and/or combination chemotherapy. **Later stage —** combination chemotherapy or hormones and radiation therapy for selected clinical problems.	Yearly mammogram, women 40+ continuing for women in good health; clinical breast examinations every three years for women 20-39, and every year for women 40 and older; breast self examination is an option for women starting in their 20s. Women at increased risk should talk with their doctors about the benefits and limitations of earlier mammogram.
Abnormal vaginal bleeding.	**Precursor lesions —** cryotherapy (kills cells by cold), electro-coagulation (kills cells by heat from an electrical current); surgery. **Later stage —** combination chemotherapy or hormones and radiation therapy for selected clinical problems.	Pap test and pelvic examination every year for women who are or have been sexually active or have reached age 18; after three or more consecutive satisfactory normal annual exams, the Pap test may be performed less frequently at the discretion of the physician.
Rectal bleeding; change in bowel habits; blood in the stools.	**Localized —** surgery or radiation therapy. **Invasive —** surgery or radiation therapy. **Metastatic —** chemotherapy/radiation therapy. Surgery at times combined with radiation therapy or chemotherapy. Chemotherapy in advanced cases is under study.	50+: colonoscopy every 10 years; or flexible sigmoidoscopy every five years; or double-contrast barium enema every five years; or stool blood test every year (acceptable but not preferred). Flexible sigmoidoscopy every five years with annual stool blood test is preferred over stool blood test or flexible sigmoidoscopy alone. Follow positive tests with colonoscopy.
Vaginal bleeding after menopause.	For uterine hyperplasia, progestins may be used. Surgery sometimes with radiation therapy. Advanced metastases — progestins/chemotherapy.	Women at high risk for cancer of the endometrium should have a sample of endometrial tissue examined when menopause begins.
Lymph node enlargement; fever.	Usually disseminated at time of diagnosis; chemotherapy is used. At times, autologous bone marrow transplantation may be used.	Annual physician examination for people age 40+, every three years for people aged 20-40.
Fatigue; pallor; repeated infection; easy bruising; nose bleeds.	Combination chemotherapy; bone-marrow transplantation may be used in some cases.	Annual physician examination for people age 40+, every three years for people aged 20-40.
Nagging cough; change in breathing habits; coughing up blood; chest pain; hoarseness; shortness of breath; weight loss; appetite loss; anemia; unresolved pneumonia.	**Early stage —** surgery. **Advanced stages —** surgery, radiation therapy, chemotherapy, immunotherapy.	Annual physician examination for people age 40+, every three years for people aged 20-40.
Change in the size, shape, or color of a mole or signs that its border is becoming ragged; a sore that doesn't heal.	Surgery, radiation therapy, and chemotherapy depending on type. In small-cell lung cancer, chemotherapy alone or combined with radiation therapy may be the first choice.	Annual physician examination for people age 40+, every three years for people aged 20-40.
Symptoms are often "silent"; enlarged abdomen; digestive problems such as gas and bloating that persist and cannot be tied to another cause; abnormal vaginal bleeding; pelvic or leg pain.	Surgery, radiation therapy, and chemotherapy.	Health-related checkups may identify early signs and symptoms.
Difficulty passing urine; blood in urine.	**Early stage —** surgery or radiation therapy. **Advanced stages —** radiation therapy, hormone treatments, or anticancer drugs. Radiation therapy can ease painful areas in the bones.	Beginning at age 50, men who have at least a 10-year life expectancy should be offered an annual digital rectal exam and prostate-specific antigen (with counseling about benefits and limitations); Men in high risk groups – African Americans and men with two or more affected first degree relatives — should begin at age 45.

Understanding Cancer Incidence & Mortality Rates

Cancer rates in this document represent the number of new cases of cancer per 100,000 population (incidence) or the number of cancer deaths per 100,000 population (mortality) during a specific time period.

For example, if a county's lung cancer incidence rate is 40.0 that means 40 new cases of lung cancer were diagnosed for every 100,000 people. If the county's population is 25,000, then an incidence rate of 40.0 means 10 new cases of lung cancer were diagnosed in that county that year.

$$\frac{\text{40 new cases diagnosed in one year}}{\text{100,000 population}} = \frac{\text{10 new cases diagnosed in one year}}{\text{25,000 population}}$$

Rates provide a useful way to compare cancer burden irrespective of the actual population size. Rates can be used to compare demographic groups (males have higher lung cancer rates than females), race/ethnic groups (African-American males have higher prostate cancer rates than white males), or geographic areas (Indiana has higher lung cancer incidence rates than California).

Age-Adjusted Rates

Older age groups generally have higher cancer rates than younger age groups. For example, more than 60% of new lung cancer cases occur in those aged 65 and older. As a result, if one county's lung cancer incidence rate is higher than another, the first question asked is whether the county with a higher rate has an older population.

To address this issue, all mortality and incidence rates presented in this booklet have been age-adjusted. This removes the impact of different age distributions between populations and allows for direct comparisons of those populations. Age-adjustment also allows for a comparison of rates within a single population over time. An age adjusted rate is not a real measure of the burden of the disease on a population, but rather an artificial measure that is used for comparison purposes.

All mortality and incidence rates in this publication, provided by the Indiana State Cancer Registry, were age-adjusted using the direct method. The direct standardization method weights the age-specific rates for a given gender, race, or geographic area by the age distribution of the standard population. The 2000 United States standard million population was used for all rates provided in this booklet.

Glossary

Burden: Number of new cases and/or deaths from cancer or overall impact of cancer in a community.

Carcinogen: Anything chemical, physical or viral that causes cancer.

Five-year Survival: The percentage of people with a given cancer who are expected to survive five years or longer with the disease. Five-year survival rates have some drawbacks. While statistically valid, these may not reflect current advances in treatment. Therefore, five-year survival rates should not be seen as a predictor in an individual case.

Lifetime risk: The probability that an individual, over the course of a lifetime, will develop or die from cancer.

Malignant: The description for the kind of cancer that has spread beyond the location in which it started.

Metastasis: Movement of disease from one organ or part to another not directly connected.

Morbidity: The number of people who have a disease.

Prevalence: A calculation of the proportion of people with a certain disease at a given time.

Rate: The frequency of an event in a defined population at a given period of time. Often expressed per 100,000 people.

Risk factor: Anything that increases a person's probability of getting a disease, such as cancer. Risk factors can be lifestyle-related, environmental, or genetic (inherited).

Staging: The process of finding out whether cancer has spread and if so, how far. There is more than one system for staging.

Indiana Cancer Consortium

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- Advocacy
- Breast Cancer
- Colorectal Cancer
- Data
- Prostate Cancer
- Tobacco Use

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