Appendix A

Resources & Reference Materials

PEPAGESEX

Annual Estimates of the Resident Population for Selected Age Groups by Sex for the United States, States, Counties, and Puerto Rico Commonweal and Municipios: April 1, 2010 to July 1, 2015
2015 Population Estimates

Versions of this table are available for the following years:
2015
2014
2013
2012

Geography: Steuben County, Indiana ▼

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Age	Population Estimates (as of July 1)																	
	2010			2011			2012			2013			2014			2015		
	Both Sexes	Male	Female	Both Sexes	Male	Female	Both Sexes	Male	Female	Both Sexes	Male	Female	Both Sexes	Male	Females	Both Sexes	Male	Fe
Total	34,137	17,217	16,920	34,064	17,220	16,844	34,164	17,299	16,865	34,328	17,429	16,899	34,406	17,453	16,953	34,372	17,452	16
Under 5 years	1,862	937	925	1,813	921	892	1,764	895	869	1,735	892	843	1,776	919	857	1,835	954	
5 to 9 years	2,151	1,076	1,075	2,080	1,014	1,066	2,051	1,032	1,019	2,033	1,027	1,006	1,976	997	979	1,852	950	
10 to 14 years	2,245	1,155	1,090	2,235	1,147	1,088	2,192	1,106	1,086	2,195	1,090	1,105	2,219	1,102	1,117	2,151	1,071	1
15 to 19 years	2,755	1,466	1,289	2,720	1,481	1,239	2,654	1,459	1,195	2,635	1,467	1,168	2,567	1,417	1,150	2,514	1,388	1
20 to 24 years	2,353	1,336	1,017	2,412	1,380	1,032	2,429	1,389	1,040	2,493	1,399	1,094	2,523	1,409	1,114	2,522	1,410	1
25 to 29 years	1,715	885	830	1,685	861	824	1,718	859	859	1,780	914	866	1,817	948	869	1,860	967	
30 to 34 years	1,788	930	858	1,758	926	832	1,748	919	829	1,739	914	825	1,766	915	851	1,770	912	
35 to 39 years	2,046	1,023	1,023	1,936	953	983	1,907	936	971	1,849	919	930	1,800	900	900	1,757	898	
40 to 44 years	2,226	1,123	1,103	2,221	1,133	1,088	2,192	1,135	1,057	2,161	1,114	1,047	2,098	1,065	1,033	2,072	1,037	1
45 to 49 years	2,510	1,252	1,258	2,465	1,254	1,211	2,424	1,229	1,195	2,374	1,203	1,171	2,331	1,197	1,134	2,235	1,116	1
50 to 54 years	2,589	1,306	1,283	2,616	1,305	1,311	2,599	1,302	1,297	2,553	1,279	1,274	2,530	1,277	1,253	2,497	1,272	1
55 to 59 years	2,516	1,269	1,247	2,465	1,243	1,222	2,513	1,280	1,233	2,572	1,314	1,258	2,599	1,313	1,286	2,655	1,336	1
60 to 64 years	2,260	1,125	1,135	2,403	1,200	1,203	2,424	1,207	1,217	2,453	1,229	1,224	2,497	1,249	1,248	2,536	1,273	1
65 to 69 years	1,749	870	879	1,776	874	902	1,930	942	988	2,003	978	1,025	2,028	990	1,038	2,178	1,080	1
70 to 74 years	1,258	618	640	1,309	636	673	1,370	672	698	1,461	715	746	1,516	741	775	1,578	775	
75 to 79 years	899	421	478	929	444	485	970	453	517	986	479	507	1,035	510	525	1,067	520	
80 to 84 years	633	249	384	654	260	394	670	287	383	670	292	378	693	308	385	676	300	
85 years and over	582	176	406	587	188	399	609	197	412	636	204	432	635	196	439	617	193	
Under 18 years	7,767	3,934	3,833	7,573	3,835	3,738	7,414	3,771	3,643	7,367	3,753	3,614	7,331	3,719	3,612	7,166	3,662	3
Under 5 years	1,862	937	925	1,813	921	892	1,764	895	869	1,735	892	843	1,776	919	857	1,835	954	
5 to 13 years	3,941	1,984	1,957	3,861	1,925	1,936	3,767	1,885	1,882	3,811	1,909	1,902	3,738	1,866	1,872	3,566	1,793	1
14 to 17 years	1,964	1,013	951	1,899	989	910	1,883	991	892	1,821	952	869	1,817	934	883	1,765	915	
18 to 64 years	21,249	10,949	10,300	21,236	10,983	10,253	21,201	10,977	10,224	21,205	11,008	10,197	21,168	10,989	10,179	21,090	10,922	10
18 to 24 years	3,599	2,036	1,563	3,687	2,108	1,579	3,676	2,110	1,566	3,724	2,122	1,602	3,730	2,125	1,605	3,708	2,111	1
25 to 44 years	7,775	3,961	3,814	7,600	3,873	3,727	7,565	3,849	3,716	7,529	3,861	3,668	7,481	3,828	3,653	7,459	3,814	3
45 to 64 years	9,875	4,952	4,923	9,949	5,002	4,947	9,960	5,018	4,942	9,952	5,025	4,927	9,957	5,036	4,921	9,923	4,997	4
65 years and over	5,121	2,334	2,787	5,255	2,402	2,853	5,549	2,551	2,998	5,756	2,668	3,088	5,907	2,745	3,162	6,116	2,868	3
85 years and over	582	176	406	587	188	399	609	197	412	636	204	432	635	196	439	617	193	
16 years and over	27,392	13,802	13,590	27,483	13,891	13,592	27,709	14,038	13,671	27,893	14,165	13,728	28,021	14,228	13,793	28,092	14,252	13
18 years and over	26,370	13,283	13,087	26,491	13,385	13,106	26,750	13,528	13,222	26,961	13,676	13,285	27,075	13,734	13,341	27,206	13,790	13
15 to 44 years	12,883	6,763	6,120	12,732	6,734	5,998	12,648	6,697	5,951	12,657	6,727	5,930	12,571	6,654	5,917	12,495	6,612	5
Median age (years)	40.4	39.2	41.6	40.8	39.7	42.1	41.4	40.2	42.7	41.7	40.5	42.9	41.9	40.6	43.2	42.4	40.9	

Notes:
The estimates are based on the 2010 Census and reflect changes to the April 1, 2010 population due to the Count Question Resolution program and geographic program revisions. Median age is calculated based on singl year of age. For population estimates methodology statements, see http://www.census.gov/popest/methodology/index.html.

The 6,222 people in Bedford city, Virginia, which was an independent city as of the 2010 Census, are not included in the April 1, 2010 Census enumerated population presented in the county estimates. In July 2013, the leg status of Bedford changed from a city to a town and it became dependent within (or part of) Bedford County, Virginia. This population of Bedford town is now included in the April 1, 2010 estimates base and all July 1 estimates for Bedford County. Because it is no longer an independent city, Bedford town is not listed in this table. As a result, the sum of the April 1, 2010 census values for Virginia counties and independent cities does not equal the 2010 Census count for Virginia, and the sum of April 1, 2010 census values for all counties and independent cities in the United States does not equal the 2010 Census count for the United States. Substantial geographic changes to counties can be found on the Census Bureau website at http://www.census.gov/geo/reference/county-changes.html.

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Source: U.S. Census Bureau, Population Division
Release Date: June 2016

DP05

ACS DEMOGRAPHIC AND HOUSING ESTIMATES
2010-2014 American Community Survey 5-Year Estimates

Although the American Community Survey (ACS) produces population, demographic and housing unit estimates, it is the Census Bureau's Population Estimates Program that produces and disseminates the official estimates of the population for the nation, states, counties, cities and towns and estimates of housing units for states and counties.

Supporting documentation on code lists, subject definitions, data accuracy, and statistical testing can be found on the American Community Survey website in the Data and Documentation section.

Sample size and data quality measures (including coverage rates, allocation rates, and response rates) can be found on the American Community Survey website in the Methodology section.

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Subject	Steuben County, Indiana			
	Estimate	Margin of Error	Percent	Percent Margin of Error
SEX AND AGE				
Total population	34,190	*****	34,190	(X)
Male	17,273	+/-38	50.5%	+/-0.1
Female	16,917	+/-38	49.5%	+/-0.1
Under 5 years	1,768	*****	5.2%	*****
5 to 9 years	2,053	+/-180	6.0%	+/-0.5
10 to 14 years	2,238	+/-181	6.5%	+/-0.5
15 to 19 years	2,704	+/-71	7.9%	+/-0.2
20 to 24 years	2,405	+/-36	7.0%	+/-0.1
25 to 34 years	3,447	+/-64	10.1%	+/-0.2
35 to 44 years	4,166	+/-70	12.2%	+/-0.2
45 to 54 years	4,967	+/-57	14.5%	+/-0.2
55 to 59 years	2,513	+/-202	7.4%	+/-0.6
60 to 64 years	2,451	+/-207	7.2%	+/-0.6
65 to 74 years	3,251	+/-9	9.5%	+/-0.1
75 to 84 years	1,727	+/-130	5.1%	+/-0.4
85 years and over	500	+/-129	1.5%	+/-0.4
Median age (years)	41.2	+/-0.4	(X)	(X)
18 years and over	26,717	*****	78.1%	*****
21 years and over	24,861	+/-146	72.7%	+/-0.4
62 years and over	6,998	+/-179	20.5%	+/-0.5
65 years and over	5,478	+/-9	16.0%	+/-0.1
18 years and over	26,717	*****	26,717	(X)
Male	13,509	+/-23	50.6%	+/-0.1
Female	13,208	+/-24	49.4%	+/-0.1
65 years and over	5,478	+/-9	5,478	(X)
Male	2,530	+/-6	46.2%	+/-0.1
Female	2,948	+/-5	53.8%	+/-0.1
RACE				
Total population	34,190	*****	34,190	(X)
One race	32,600	+/-365	95.3%	+/-1.1
Two or more races	1,590	+/-365	4.7%	+/-1.1
One race	32,600	+/-365	95.3%	+/-1.1
White	31,736	+/-428	92.8%	+/-1.3

Versions of this table are available for the following years:

2014
2013
2012
2011
2010

Black or African American	235	+/-121	0.7%	+/-0.4
American Indian and Alaska Native	94	+/-90	0.3%	+/-0.3
Cherokee tribal grouping	0	+/-24	0.0%	+/-0.1
Chippewa tribal grouping	0	+/-24	0.0%	+/-0.1
Navajo tribal grouping	0	+/-24	0.0%	+/-0.1
Sioux tribal grouping	0	+/-24	0.0%	+/-0.1
Asian	485	+/-195	1.4%	+/-0.6
Asian Indian	8	+/-13	0.0%	+/-0.1
Chinese	53	+/-37	0.2%	+/-0.1
Filipino	30	+/-33	0.1%	+/-0.1
Japanese	57	+/-85	0.2%	+/-0.2
Korean	74	+/-61	0.2%	+/-0.2
Vietnamese	59	+/-85	0.2%	+/-0.2
Other Asian	204	+/-135	0.6%	+/-0.4
Native Hawaiian and Other Pacific Islander	8	+/-13	0.0%	+/-0.1
Native Hawaiian	0	+/-24	0.0%	+/-0.1
Guamanian or Chamorro	0	+/-24	0.0%	+/-0.1
Samoan	8	+/-13	0.0%	+/-0.1
Other Pacific Islander	0	+/-24	0.0%	+/-0.1
Some other race	42	+/-43	0.1%	+/-0.1
Two or more races	1,590	+/-365	4.7%	+/-1.1
White and Black or African American	157	+/-91	0.5%	+/-0.3
White and American Indian and Alaska Native	1,287	+/-362	3.8%	+/-1.1
White and Asian	134	+/-84	0.4%	+/-0.2
Black or African American and American Indian and Alaska Native	0	+/-24	0.0%	+/-0.1
Race alone or in combination with one or more other races				
Total population	34,190	*****	34,190	(X)
White	33,326	+/-225	97.5%	+/-0.7
Black or African American	404	+/-160	1.2%	+/-0.5
American Indian and Alaska Native	1,393	+/-363	4.1%	+/-1.1
Asian	620	+/-219	1.8%	+/-0.6
Native Hawaiian and Other Pacific Islander	9	+/-14	0.0%	+/-0.1
Some other race	42	+/-43	0.1%	+/-0.1
HISPANIC OR LATINO AND RACE				
Total population	34,190	*****	34,190	(X)
Hispanic or Latino (of any race)	1,059	*****	3.1%	*****
Mexican	701	+/-159	2.1%	+/-0.5
Puerto Rican	252	+/-137	0.7%	+/-0.4
Cuban	0	+/-24	0.0%	+/-0.1
Other Hispanic or Latino	106	+/-69	0.3%	+/-0.2
Not Hispanic or Latino	33,131	*****	96.9%	*****
White alone	30,713	+/-429	89.8%	+/-1.3
Black or African American alone	235	+/-121	0.7%	+/-0.4
American Indian and Alaska Native alone	94	+/-90	0.3%	+/-0.3
Asian alone	485	+/-195	1.4%	+/-0.6
Native Hawaiian and Other Pacific Islander alone	8	+/-13	0.0%	+/-0.1
Some other race alone	25	+/-36	0.1%	+/-0.1
Two or more races	1,571	+/-362	4.6%	+/-1.1
Two races including Some other race	0	+/-24	0.0%	+/-0.1
Two races excluding Some other race, and Three or more races	1,571	+/-362	4.6%	+/-1.1
Total housing units	19,418	+/-104	(X)	(X)

Source: U.S. Census Bureau, 2010-2014 American Community Survey 5-Year Estimates

Explanation of Symbols:
An '**' entry in the margin of error column indicates that either no sample observations or too few sample observations were available to compute a standard error and thus the margin of error. A statistical test is not appropriate.
An '-' entry in the estimate column indicates that either no sample observations or too few sample observations were available to compute an estimate, or a ratio of medians cannot be calculated because one or both of the median estimates falls in the lowest interval or upper interval of an open-ended distribution.
An '-' following a median estimate means the median falls in the lowest interval of an open-ended distribution.
An '+' following a median estimate means the median falls in the upper interval of an open-ended distribution.
An '***' entry in the margin of error column indicates that the median falls in the lowest interval or upper interval of an open-ended distribution. A statistical test is not appropriate.
An '*****' entry in the margin of error column indicates that the estimate is controlled. A statistical test for sampling variability is not appropriate.
An 'N' entry in the estimate and margin of error columns indicates that data for this geographic area cannot be displayed because the number of sample cases is too small.
An '(X)' means that the estimate is not applicable or not available.

Data are based on a sample and are subject to sampling variability. The degree of uncertainty for an estimate arising from sampling variability is represented through the use of a margin of error. The value shown here is the 90 percent margin of error. The margin of error can be interpreted roughly as providing a 90 percent probability that the interval defined by the estimate minus the margin of error and the estimate plus the margin of error (the lower and upper confidence bounds) contains the true value. In addition to sampling variability, the ACS estimates are subject to nonsampling error (for a discussion of nonsampling variability, see Accuracy of the Data). The effect of nonsampling error is not represented in these tables.

For more information on understanding race and Hispanic origin data, please see the Census 2010 Brief entitled, Overview of Race and Hispanic Origin: 2010, issued March 2011. (pdf format)

While the 2010-2014 American Community Survey (ACS) data generally reflect the February 2013 Office of Management and Budget (OMB) definitions of metropolitan and micropolitan statistical areas; in certain instances the names, codes, and boundaries of the principal cities shown in ACS tables may differ from the OMB definitions due to differences in the effective dates of the geographic entities.

Estimates of urban and rural population, housing units, and characteristics reflect boundaries of urban areas defined based on Census 2010 data. As a result, data for urban and rural areas from the ACS do not necessarily reflect the results of ongoing urbanization.

2016 National Statistics Reference Table

Total # of counties in US – 3,143 **Total # of unranked counties in 2016 – 68** **Total # of ranked counties in 2016 – 3,075**

Category	Measure	Missing Counties (out of 3141)	Minimum	Maximum	Mean of Counties	Standard Deviation	10th Percentile	Median	90th Percentile	US Overall	Top Performers
Outcomes	Premature death	66	1,900	28,800	8,000	2,400	5,200	7,700	11,000	6,600	5,200
	Poor or fair health (%)	1	7%	42%	17%	5%	12%	16%	24%	18%	12%
	Poor physical health days	1	2.2	6.5	3.8	0.7	2.9	3.7	4.8	3.8	2.9
	Poor mental health days	1	2.1	5.6	3.7	0.6	2.8	3.7	4.5	3.7	2.8
	Low birthweight (%)	99	3%	28%	8%	2%	6%	8%	11%	8%	6%
Health Behaviors	Adult smoking (%)	1	7%	41%	18%	4%	14%	18%	23%	17%	14%
	Adult obesity (%)	0	11%	47%	31%	4%	25%	31%	36%	27%	25%
	Food environment index*	0	0.0	10.0	7.0	1.2	5.4	7.2	8.3	7.2	8.3
	Physical inactivity (%)	0	95	42%	27%	5%	20%	28%	34%	23%	20%
	Access to exercise opportunities* (%)	74	0	100%	59%	24%	25%	62%	91%	84%	91%
	Excessive drinking (%)	1	8%	27%	17%	3%	12%	17%	21%	17%	12%
	Alcohol-impaired driving deaths (%)	23	0%	100%	31%	16%	14%	30%	50%	31%	14%
	Sexually transmitted infections	180	34.7	2,653.1	350.1	244.5	134.1	287.7	631.6	446.6	134.1
	Teen births	99	4	124	42	19	19	40	67	35	19
Clinical Care	Uninsured (%)	1	3%	40%	17%	5%	11%	17%	24%	17%	11%
	Primary care physicians	137	210:1	20,950:1	1790:1	2880:1	1040:1	1990:1	5190:1	1320:1	1040:1
	Dentists	78	230:1	38,150:1	2350:1	3580:1	1340:1	2590:1	7620:1	1540:1	1340:1
	Mental health providers	286	70:1	54,890:1	760:1	710:1	370:1	1060:1	5620:1	490:1	370:1
	Preventable hospital stays	83	12	261	64	25	38	60	94	54	38
	Diabetic monitoring* (%)	42	19%	100%	84%	6%	78%	85%	90%	85%	90%
	Mammography screening* (%)	112	18%	86%	60%	8%	50%	61%	71%	63%	71%
Social & Economic Factors	High school graduation* (%)	504	3%	100%	84%	9%	73%	86%	93%	82%	93%
	Some college* (%)	1	3%	100%	56%	12%	41%	56%	72%	64%	72%
	Unemployment (%)	2	1.2%	23.7%	6.3%	2.3%	3.6%	6.0%	9.1%	6.2%	3.6%
	Children in poverty (%)	2	3%	66%	24%	9%	13%	23%	36%	22%	13%
	Income inequality	1	2.6	10.7	4.5	0.7	3.7	4.4	5.4	4.7	3.7
	Children in single-parent household (%)	2	0%	100%	32%	10%	21%	32%	45%	34%	21%
	Social associations*	0	0	81	14	7	7	13	22	9	22
	Violent crime rate	167	0	1,885	249	197	59	199	503	392	59
	Injury deaths	117	25	277	78	25	51	74	107	60	51
Physical Environment	Air pollution – particulate matter**	33	7.2	14.9	11.6	1.5	9.5	11.9	13.4	11.4	9.5
	Drinking water violations (%)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Severe housing problems (%)	0	2%	71%	14%	5%	9%	14%	20%	19%	9%
	Driving alone to work (%)	1	5%	96%	79%	8%	71%	80%	86%	76%	71%
	Long commute – driving alone (%)	1	0%	72%	30%	12%	15%	29%	47%	31%	15%

* Reverse-coded measures, the Top Performers are the 90th percentile. For all other measures, the Top Performers are the 10th percentile.
** No data were available for these measures for Alaska and Hawaii.

Additional Measures

Category	Measure	Missing Counties (out of 3141)	Minimum	Maximum	Mean of Counties	Standard Deviation	10th Percentile	Median	90th Percentile	US Overall
Outcomes	Premature age-adjusted mortality	66	120	980	390	100	270	380	520	330
	Child mortality	1174	20	330	60	30	40	60	90	50
	Infant mortality	1803	3	20	7	2	5	7	10	6
	Frequent physical distress	1	7%	22%	12%	3%	9%	11%	15%	12%
	Frequent mental distress	1	7%	19%	11%	2%	9%	11%	14%	12%
	Diabetes	1	5%	22%	11%	2%	9%	11%	14%	10%
	HIV prevalence	796	10	3,623	184	241	41	108	406	350
Health Behaviors	Food insecurity	0	4%	33%	15%	4%	11%	15%	20%	15%
	Limited access to healthy foods	0	0%	72%	8%	8%	1%	6%	17%	57%
	Drug overdose deaths	1559	3	85	17	9	8	15	27	14
	Drug overdose deaths – modeled	1	<2	>20	NA	NA	NA	12.1-14	NA	NA
	Motor vehicle crash deaths	410	3	84	20	10	9	18	32	12
	Insufficient sleep	1	23%	47%	33%	4%	28%	33%	38%	35%
Clinical Care	Uninsured adults	1	4%	51%	21%	7%	13%	21%	29%	20%
	Uninsured children	1	1%	32%	9%	4%	5%	8%	14%	8%
	Health care costs	6	$4,149	$18,543	$9,322	$1,489	$7,508	$9,276	$11,157	$9,541
	Other primary care providers	40	78:1	43,931:1	1,550:1	1,996:1	866:1	1,815:1	4,735:1	1,420:1
Social & Economic Factors	Median household income	2	$21,700	$125,600	$47,100	$12,100	$34,200	$45,200	$61,700	%53,700
	Children eligible for free lunch	162	0	99%	45%	16%	25%	44%	66%	43%
	Residential segregation - black/white	1136	0	91	46	17	23	46	67	63
	Racial segregation - non-white/white	361	0	89	31	13	15	31	48	48
	Homicides	1914	0	45	6	5	2	5	12	6
Demographics	Population	1	86	10,116,705	101,547	326,268	5,185	25,740	203,832	NA
	% below 18 years of age	1	0	42.0%	22.6%	3.4%	18.7%	22.5%	26.4%	22.8%
	% 65 and older	1	4.1%	52.9%	17.6%	4.4%	12.2%	17.3%	23.5%	14.8%
	% Non-Hispanic African American	1	0%	84.9%	8.9%	14.3%	0.4%	2.2%	29.9%	12.4%
	% American Indian and Alaskan Native	1	0%	92.2%	2.2%	7.6%	0.2%	0.6%	3.1%	1.2%
	% Asian	1	0%	42.4%	14.0%	2.7%	0.3%	0.7%	3.0%	5.4%
	% Native Hawaiian/Other Pacific Islander	1	0%	48.3%	0.1%	1.0%	0.0%	0.1%	0.2%	0.2%
	% Hispanic	1	0.2%	95.8%	9.0%	13.5%	1.3%	3.9%	22.9%	17.4%
	% Non-Hispanic white	1	0.031	98.6%	77.1%	19.9%	46.6%	84.5%	95.7%	62.1%
	% not proficient in English	1	0.000	30.1%	1.8%	2.9%	0.1%	0.8%	4.6%	4.6%
	% Females	1	0.301	56.8%	49.9%	2.3%	47.8%	50.4%	51.7%	50.7%
	% Rural	0	0.000	100.0%	58.6%	31.5%	13.3%	59.5%	100.0%	19.3%

S1501

EDUCATIONAL ATTAINMENT
2010-2014 American Community Survey 5-Year Estimates

Although the American Community Survey (ACS) produces population, demographic and housing unit estimates, it is the Census Bureau's Population Estimates Program that produces and disseminates the official estimates of the population for the nation, states, counties, cities and towns and estimates of housing units for states and counties.

Supporting documentation on code lists, subject definitions, data accuracy, and statistical testing can be found on the American Community Survey website in the Data and Documentation section.

Sample size and data quality measures (including coverage rates, allocation rates, and response rates) can be found on the American Community Survey website in the Methodology section.

Versions of this table are available for the following years:

2014
2013
2012
2011
2010
2009

1 - 38 of 38

Subject	Steuben County, Indiana					
	Total		Male		Female	
	Estimate	Margin of Error	Estimate	Margin of Error	Estimate	Margin of Error
Population 18 to 24 years	3,695	+/-94	2,106	+/-67	1,589	+/-38
Less than high school graduate	11.1%	+/-4.2	11.8%	+/-5.1	10.2%	+/-4.4
High school graduate (includes equivalency)	37.8%	+/-4.0	41.7%	+/-6.4	32.5%	+/-7.4
Some college or associate's degree	47.0%	+/-4.8	44.8%	+/-7.2	50.0%	+/-7.2
Bachelor's degree or higher	4.1%	+/-1.6	1.6%	+/-1.7	7.3%	+/-3.4
Population 25 years and over	23,022	+/-94	11,403	+/-71	11,619	+/-45
Less than 9th grade	2.9%	+/-0.8	3.4%	+/-1.1	2.3%	+/-0.9
9th to 12th grade, no diploma	8.1%	+/-1.2	7.1%	+/-1.4	9.1%	+/-1.7
High school graduate (includes equivalency)	38.3%	+/-2.0	38.9%	+/-2.5	37.7%	+/-2.7
Some college, no degree	21.6%	+/-1.6	21.6%	+/-1.8	21.6%	+/-2.3
Associate's degree	9.0%	+/-1.1	9.1%	+/-1.6	9.0%	+/-1.4
Bachelor's degree	13.9%	+/-1.4	14.2%	+/-1.9	13.6%	+/-1.8
Graduate or professional degree	6.2%	+/-0.9	5.8%	+/-1.1	6.7%	+/-1.3
Percent high school graduate or higher	89.0%	+/-1.5	89.5%	+/-1.7	88.5%	+/-1.9
Percent bachelor's degree or higher	20.1%	+/-1.6	20.0%	+/-2.0	20.2%	+/-2.1
Population 25 to 34 years	3,447	+/-64	1,763	+/-36	1,684	+/-38
High school graduate or higher	88.5%	+/-3.6	87.9%	+/-3.9	89.2%	+/-5.7
Bachelor's degree or higher	19.2%	+/-4.7	18.5%	+/-5.5	19.9%	+/-6.0
Population 35 to 44 years	4,166	+/-70	2,140	+/-63	2,026	+/-25
High school graduate or higher	90.0%	+/-3.5	87.3%	+/-4.9	92.8%	+/-3.5
Bachelor's degree or higher	25.4%	+/-4.1	21.8%	+/-4.7	29.1%	+/-5.7
Population 45 to 64 years	9,931	+/-27	4,970	+/-25	4,961	+/-34
High school graduate or higher	90.7%	+/-2.0	92.2%	+/-2.3	89.2%	+/-2.8
Bachelor's degree or higher	19.9%	+/-2.5	17.8%	+/-2.7	22.0%	+/-3.8
Population 65 years and over	5,478	+/-9	2,530	+/-6	2,948	+/-5
High school graduate or	85.5%	+/-2.5	87.3%	+/-3.0	84.0%	+/-3.9

higher						
Bachelor's degree or higher	17.0%	+/-2.8	23.7%	+/-4.7	11.3%	+/-2.7
POVERTY RATE FOR THE POPULATION 25 YEARS AND OVER FOR WHOM POVERTY STATUS IS DETERMINED BY EDUCATIONAL ATTAINMENT LEVEL						
Less than high school graduate	16.6%	+/-4.2	16.4%	+/-5.9	16.8%	+/-6.4
High school graduate (includes equivalency)	9.1%	+/-1.6	8.0%	+/-2.0	10.3%	+/-2.7
Some college or associate's degree	7.2%	+/-2.0	5.1%	+/-2.3	9.3%	+/-2.9
Bachelor's degree or higher	3.9%	+/-1.6	2.6%	+/-2.4	5.1%	+/-2.3
MEDIAN EARNINGS IN THE PAST 12 MONTHS (IN 2014 INFLATION-ADJUSTED DOLLARS)						
Population 25 years and over with earnings	30,767	+/-1,531	40,094	+/-2,195	24,242	+/-1,819
Less than high school graduate	20,214	+/-3,039	24,605	+/-7,494	10,881	+/-1,856
High school graduate (includes equivalency)	26,826	+/-1,348	33,556	+/-2,328	20,162	+/-3,015
Some college or associate's degree	29,331	+/-2,634	41,310	+/-4,839	22,085	+/-2,012
Bachelor's degree	44,448	+/-4,945	50,435	+/-5,544	36,490	+/-4,212
Graduate or professional degree	60,166	+/-6,051	72,963	+/-11,785	56,138	+/-6,199
PERCENT IMPUTED						
Educational attainment	3.8%	(X)	(X)	(X)	(X)	(X)

Source: U.S. Census Bureau, 2010-2014 American Community Survey 5-Year Estimates

Explanation of Symbols:
An '**' entry in the margin of error column indicates that either no sample observations or too few sample observations were available to compute a standard error and thus the margin of error. A statistical test is not appropriate.
An '-' entry in the estimate column indicates that either no sample observations or too few sample observations were available to compute an estimate, or a ratio of medians cannot be calculated because one or both of the median estimates falls in the lowest interval or upper interval of an open-ended distribution.
An '-' following a median estimate means the median falls in the lowest interval of an open-ended distribution.
An '+' following a median estimate means the median falls in the upper interval of an open-ended distribution.
An '***' entry in the margin of error column indicates that the median falls in the lowest interval or upper interval of an open-ended distribution. A statistical test is not appropriate.
An '******' entry in the margin of error column indicates that the estimate is controlled. A statistical test for sampling variability is not appropriate.
An 'N' entry in the estimate and margin of error columns indicates that data for this geographic area cannot be displayed because the number of sample cases is too small.
An '(X)' means that the estimate is not applicable or not available.

Data are based on a sample and are subject to sampling variability. The degree of uncertainty for an estimate arising from sampling variability is represented through the use of a margin of error. The value shown here is the 90 percent margin of error. The margin of error can be interpreted roughly as providing a 90 percent probability that the interval defined by the estimate minus the margin of error and the estimate plus the margin of error (the lower and upper confidence bounds) contains the true value. In addition to sampling variability, the ACS estimates are subject to nonsampling error (for a discussion of nonsampling variability, see Accuracy of the Data). The effect of nonsampling error is not represented in these tables.

While the 2010-2014 American Community Survey (ACS) data generally reflect the February 2013 Office of Management and Budget (OMB) definitions of metropolitan and micropolitan statistical areas; in certain instances the names, codes, and boundaries of the principal cities shown in ACS tables may differ from the OMB definitions due to differences in the effective dates of the geographic entities.

Estimates of urban and rural population, housing units, and characteristics reflect boundaries of urban areas defined based on Census 2010 data. As a result, data for urban and rural areas from the ACS do not necessarily reflect the results of ongoing urbanization.

QuickFacts

Steuben County, Indiana

QuickFacts provides statistics for all states and counties, and for cities and towns with a population of 5,000 or more.

All Topics ▼	STEUBEN COUNTY, INDIANA
People	
Population	
Population estimates, July 1, 2015, (V2015)	34,372
Population estimates, July 1, 2014, (V2014)	34,308
Population estimates base, April 1, 2010, (V2015)	34,183
Population estimates base, April 1, 2010, (V2014)	34,183
Population, percent change - April 1, 2010 (estimates base) to July 1, 2015, (V2015)	0.6%
Population, percent change - April 1, 2010 (estimates base) to July 1, 2014, (V2014)	0.4%
Population, Census, April 1, 2010	34,185
Age and Sex	
Persons under 5 years, percent, July 1, 2014, (V2014)	4.9%
Persons under 5 years, percent, April 1, 2010	5.5%
Persons under 18 years, percent, July 1, 2014, (V2014)	21.1%
Persons under 18 years, percent, April 1, 2010	22.9%
Persons 65 years and over, percent, July 1, 2014, (V2014)	17.2%
Persons 65 years and over, percent, April 1, 2010	14.9%
Female persons, percent, July 1, 2014, (V2014)	49.3%
Female persons, percent, April 1, 2010	49.5%
Race and Hispanic Origin	
White alone, percent, July 1, 2014, (V2014) (a)	97.2%
White alone, percent, April 1, 2010 (a)	96.8%
Black or African American alone, percent, July 1, 2014, (V2014) (a)	0.9%
Black or African American alone, percent, April 1, 2010 (a)	0.5%
American Indian and Alaska Native alone, percent, July 1, 2014, (V2014) (a)	0.3%
American Indian and Alaska Native alone, percent, April 1, 2010 (a)	0.3%
Asian alone, percent, July 1, 2014, (V2014) (a)	0.6%
Asian alone, percent, April 1, 2010 (a)	0.5%
Native Hawaiian and Other Pacific Islander alone, percent, July 1, 2014, (V2014) (a)	0.0%
Native Hawaiian and Other Pacific Islander alone, percent, April 1, 2010 (a)	Z
Two or More Races, percent, July 1, 2014, (V2014)	1.0%
Two or More Races, percent, April 1, 2010	0.9%
Hispanic or Latino, percent, July 1, 2014, (V2014) (b)	3.2%
Hispanic or Latino, percent, April 1, 2010 (b)	2.9%
White alone, not Hispanic or Latino, percent, July 1, 2014, (V2014)	94.3%
White alone, not Hispanic or Latino, percent, April 1, 2010	95.1%
Population Characteristics	
Veterans, 2010-2014	2,469
Foreign born persons, percent, 2010-2014	2.6%
Housing	
Housing units, July 1, 2014, (V2014)	19,529
Housing units, April 1, 2010	19,377
Owner-occupied housing unit rate, 2010-2014	77.7%
Median value of owner-occupied housing units, 2010-2014	$124,300
Median selected monthly owner costs -with a mortgage, 2010-2014	$1,057
Median selected monthly owner costs -without a mortgage, 2010-2014	$373
Median gross rent, 2010-2014	$650
Building permits, 2014	98
Families and Living Arrangements	
Households, 2010-2014	13,409
Persons per household, 2010-2014	2.45
Living in same house 1 year ago, percent of persons age 1 year+, 2010-2014	85.3%
Language other than English spoken at home, percent of persons age 5 years+, 2010-2014	4.4%
Education	
High school graduate or higher, percent of persons age 25 years+, 2010-2014	89.0%
Bachelor's degree or higher, percent of persons age 25 years+, 2010-2014	20.1%
Health	

With a disability, under age 65 years, percent, 2010-2014	9.6%
Persons without health insurance, under age 65 years, percent	⚠ 15.8%
Economy	
In civilian labor force, total, percent of population age 16 years+, 2010-2014	63.6%
In civilian labor force, female, percent of population age 16 years+, 2010-2014	59.1%
Total accommodation and food services sales, 2012 ($1,000)	60,145
Total health care and social assistance receipts/revenue, 2012 ($1,000)	97,168
Total manufacturers shipments, 2012 ($1,000)	1,279,179
Total merchant wholesaler sales, 2012 ($1,000)	185,075
Total retail sales, 2012 ($1,000)	613,763
Total retail sales per capita, 2012	$17,986
Transportation	
Mean travel time to work (minutes), workers age 16 years+, 2010-2014	22.6
Income and Poverty	
Median household income (in 2014 dollars), 2010-2014	$48,750
Per capita income in past 12 months (in 2014 dollars), 2010-2014	$24,345
Persons in poverty, percent	⚠ 12.8%
Businesses	
Total employer establishments, 2014	951
Total employment, 2014	14,163
Total annual payroll, 2014	442,967
Total employment, percent change, 2013-2014	7.8%
Total nonemployer establishments, 2013	2,162
All firms, 2012	2,994
Men-owned firms, 2012	1,727
Women-owned firms, 2012	696
Minority-owned firms, 2012	88
Nonminority-owned firms, 2012	2,743
Veteran-owned firms, 2012	317
Nonveteran-owned firms, 2012	2,320
Geography	
Population per square mile, 2010	110.7
Land area in square miles, 2010	308.94
FIPS Code	18151

⚠ This geographic level of poverty and health estimates are not comparable to other geographic levels of these estimates

Some estimates presented here come from sample data, and thus have sampling errors that may render some apparent differences between geographies statistically indistinguishable. Click the Quick Info icon to the left of each row in TABLE view to learn about sampling error.

The vintage year (e.g., V2015) refers to the final year of the series (2010 thru 2015).
Different vintage years of estimates are not comparable.

(a) Includes persons reporting only one race
(b) Hispanics may be of any race, so also are included in applicable race categories
(c) Economic Census - Puerto Rico data are not comparable to U.S. Economic Census data

D Suppressed to avoid disclosure of confidential information
F Fewer than 25 firms
FN Footnote on this item in place of data
NA Not available
S Suppressed; does not meet publication standards
X Not applicable
Z Value greater than zero but less than half unit of measure shown

QuickFacts data are derived from: Population Estimates, American Community Survey, Census of Population and Housing, Current Population Survey, Small Area Health Insurance Estimates, Small Area Income and Poverty Estimates, State and County Housing Unit Estimates, County Business Patterns, Nonemployer Statistics, Economic Census, Survey of Business Owners, Building Permits.

Congressional and Intergovernmental (//www.census.gov/about/cong-gov-affairs.html)
Contact Us (//www.census.gov/about/contact-us.html)
(//www.census.gov/mp/www/cat/)
Publications (//www.census.gov/library/publications.html)
Genealogy (//www.census.gov/topics/population/genealogy.html)
BusinessUSA.gov (//www.businessusa.gov/)
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(//public.govdelivery.com/accounts/USCENSUS/subscriber/new)
Accessibility (//www.census.gov/about/policies/privacy/privacy-policy.html#par_textimage_1) | Information Quality (//www.census.gov/quality/) | FOIA (//www.census.gov/foia/) | Data Protection and Privacy Policy (//www.census.gov/privacy/) | U.S. Department of Commerce (//www.commerce.gov/)

Cameron Hospital - Top Diagnoses by Payer Mix - Inpatient
10/1/2014 - 9/30/2015

V30.00 Count	**148**	**SINGLE LIVEBORN**
Medicare	-	
Medicare Advantage	-	
Medicaid	85	
BlueCross	30	
Commerical	17	
Private Pay	16	
038.9 Count	**111**	**SEPTICEMIA**
Medicare	63	
Medicare Advantage	28	
Medicaid	6	
BlueCross	6	
Commerical	4	
Private Pay	4	
486 Count	**67**	**PNEUMONIA**
Medicare	33	
Medicare Advantage	23	
Medicaid	3	
BlueCross	3	
Commerical	4	
Private Pay	1	
491.21 Count	**66**	**OBSTRUCTIVE CHRONIC BRONSHITIS W/ (ACUTE) EXACERBATION**
Medicare	28	
Medicare Advantage	24	
Medicaid	2	
BlueCross	6	
Commerical	2	
Private Pay	4	

V57.89 Count	**64**	**REHABILITATION CARE**
Medicare	30	
Medicare Advantage	23	
Medicaid	-	
BlueCross	4	
Commerical	5	
Private Pay	2	
427.31 Count	**42**	**ATRIAL FIBRILLATION**
Medicare	23	
Medicare Advantage	7	
Medicaid	1	
BlueCross	2	
Commerical	4	
Private Pay	5	
V30.01 Count	**41**	**SINGLE LIVEBORN DEL C-SECT**
Medicare	-	
Medicare Advantage	-	
Medicaid	26	
BlueCross	5	
Commerical	3	
Private Pay	7	
664.11 Count	**34**	**DEL W 2 DEGREE**
Medicare	-	
Medicare Advantage	-	
Medicaid	20	
BlueCross	8	
Commerical	6	
Private Pay	-	
428.33 Count	**29**	**DIASTOLIC HEART FAILURE ACUTE ON CHRONIC**
Medicare	11	
Medicare Advantage	14	
Medicaid	-	
BlueCross	-	
Commerical	4	
Private Pay	-	

562.11 Count	**26**	**DIVERTICULITIS OF COLON W/O HEMORRHAGE**
Medicare	2	
Medicare Advantage	10	
Medicaid	-	
BlueCross	6	
Commerical	7	
Private Pay	1	
V54.81 Count	**24**	**ORTHOPEDIC AFTERCARE FOLLOWING JOINT REPLACEMENT**
Medicare	10	
Medicare Advantage	5	
Medicaid	-	
BlueCross	4	
Commerical	4	
Private Pay	1	
654.21 Count	**24**	**PREV C SECT NOS-DELIVER**
Medicare	-	
Medicare Advantage	-	
Medicaid	15	
BlueCross	4	
Commerical	3	
Private Pay	2	
682.6 Count	**21**	**CELLULITIS OF LEG**
Medicare	3	
Medicare Advantage	8	
Medicaid	1	
BlueCross	3	
Commerical	5	
Private Pay	1	
250.13 Count	**21**	**DIABETES W KETOACIDOSIS TYPE 1**
Medicare	3	
Medicare Advantage	-	
Medicaid	13	
BlueCross	1	
Commerical	1	
Private Pay	3	

434.91 Count	**21**	**CEREBRAL ARTERY OCCLUSION W/CEREBRAL INFARCTION**
Medicare	10	
Medicare Advantage	7	
Medicaid	-	
BlueCross	1	
Commerical	1	
Private Pay	2	
584.9 Count	**20**	**ACUTE KIDNEY FAILURE**
Medicare	13	
Medicare Advantage	4	
Medicaid	-	
BlueCross	-	
Commerical	2	
Private Pay	1	
038.42 Count	**19**	**E COLI SEPTICEMIA**
Medicare	9	
Medicare Advantage	6	
Medicaid	1	
BlueCross	1	
Commerical	1	
Private Pay	1	
560.9 Count	**19**	**INTESTINAL OBSTRUCTION**
Medicare	3	
Medicare Advantage	5	
Medicaid	5	
BlueCross	5	
Commerical	1	
Private Pay	-	
493.22 Count	**17**	**CHRONIC OBS ASTHMA W ACUTE EXACERB**
Medicare	4	
Medicare Advantage	3	
Medicaid	4	
BlueCross	4	
Commerical	-	
Private Pay	2	

715.96 Count	**17**	**OSTEOARTHROS NOS-L LEG**
Medicare	6	
Medicare Advantage	1	
Medicaid	2	
BlueCross	6	
Commerical	2	
Private Pay	-	
285.1 Count	**17**	**ACUTE POSTHEMORRHAGIC ANEMIA**
Medicare	7	
Medicare Advantage	5	
Medicaid	1	
BlueCross	2	
Commerical	1	
Private Pay	1	
V57.1 Count	**16**	**PHYSICAL THERAPY NEC**
Medicare	7	
Medicare Advantage	6	
Medicaid	-	
BlueCross	1	
Commerical	2	
Private Pay	-	
415.19 Count	**16**	**OTH PULMONARY EMBOLISM INFARCTION**
Medicare	7	
Medicare Advantage	5	
Medicaid	1	
BlueCross	-	
Commerical	3	
Private Pay	-	
599.0 Count	**14**	**URINARY TRACT INFECTION**
Medicare	7	
Medicare Advantage	4	
Medicaid	1	
BlueCross	-	
Commerical	-	
Private Pay	2	

577.0 Count	**14**	**ACUTE PANCREATITIS**
Medicare	1	
Medicare Advantage	2	
Medicaid	4	
BlueCross	-	
Commerical	3	
Private Pay	4	

Steuben (SU)

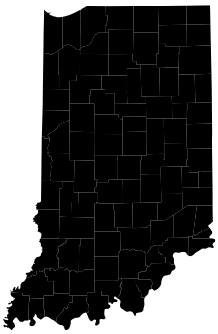
	Steuben County	Error Margin	Top U.S. Performers^	Indiana	Rank (of 92)
Health Outcomes					**14**
Length of Life					**14**
Premature death	6,500	5,500-7,500	5,200	7,600	
Quality of Life					**19**
Poor or fair health**	15%	14-15%	12%	19%	
Poor physical health days**	3.4	3.3-3.6	2.9	4.1	
Poor mental health days**	3.7	3.5-3.8	2.8	4.3	
Low birthweight	7%	6-8%	6%	8%	
Health Factors					**38**
Health Behaviors					**66**
Adult smoking**	20%	19-21%	14%	23%	
Adult obesity	34%	28-40%	25%	31%	
Food environment index	7.4		8.3	7.2	
Physical inactivity	30%	25-37%	20%	28%	
Access to exercise opportunities	49%		91%	75%	
Excessive drinking**	16%	16-17%	12%	16%	
Alcohol-impaired driving deaths	53%	42-63%	14%	25%	
Sexually transmitted infections	149.5		134.1	428.7	
Teen births	38	34-42	19	37	
Clinical Care					**40**
Uninsured	16%	14-17%	11%	16%	
Primary care physicians	2,860:1		1,040:1	1,490:1	
Dentists	2,640:1		1,340:1	1,930:1	
Mental health providers	1,430:1		370:1	710:1	
Preventable hospital stays	56	48-64	38	63	
Diabetic monitoring	86%	77-95%	90%	84%	
Mammography screening	56%	46-65%	71%	62%	
Social & Economic Factors					**23**
High school graduation	84%		93%	87%	
Some college	60%	54-65%	72%	61%	
Unemployment	5.0%		3.5%	6.0%	
Children in poverty	19%	14-24%	13%	21%	
Income inequality	3.6	3.3-3.9	3.7	4.4	
Children in single-parent households	31%	25-37%	21%	34%	
Social associations	16.6		22.1	12.6	
Violent crime	70		59	334	
Injury deaths	51	41-63	51	63	
Physical Environment					**19**
Air pollution - particulate matter	13.0		9.5	13.5	
Drinking water violations	Yes		No		
Severe housing problems	9%	8-11%	9%	14%	
Driving alone to work	85%	83-86%	71%	83%	
Long commute - driving alone	28%	24-31%	15%	30%	

^ 10th/90th percentile, i.e., only 10% are better.
Note: Blank values reflect unreliable or missing data
** Data should not be compared with prior years due to changes in definition/methods

Steuben County's Full Asset Inventory Report

Category	Grade	Points
People	C	50.6
Human Capital: Education	B-	64
Human Capital: Health	C	54.7
Government Impact & Economy	F	47.5
Public Amenities: Changeable	n/a	109.1
Public Amenities: Static	n/a	126.8
Arts, Entertainment, & Recreation	C+	66.4

N/A: Only points are used when assessing the changeable and static amenities categories.



About Steuben County

County Seat:
Angola
Founded:
1837
Area:
322 square miles

Steuben County was formed in 1837 and named after Baron Steubon. Baron Steubon was an officer who joined the army during the Revolutionary War and known for his effect discipline.During the Civil War, Steuben County was a stop on the Underground Railroad and many homes were used to escape slaves up to Canada. The county is located in the far northeast corner of the state of Indiana, therefore it is bordered by Ohio and Michigan. The county is divided into twelve townships and the county seat is Angola.

Steuben County is most famous for its 101 natural lakes.It is a popular site for vactioning and recreational water activities such as skiing and swimming. The third largest lake in Indiana, Lake James, is located in Steuben County.

Prime Outlet Mall was the first outlet mall in Indiana and a popluar attraction in Steuben County. Vestil Manufacturing, Cardinal IG, TI Group Automotive Systems, Hudson Industries, and R.R. Donnelly are

the two five employers respectively. Trine University, which offers over forty degrees, is also a significant employer in the county.

2011

BURDEN OF DIABETES IN INDIANA

Indiana State
Department of Health

BURDEN OF DIABETES IN INDIANA

INDIANA STATE DEPARTMENT OF HEALTH

Gregory N. Larkin, MD, FAAFP
State Health Commissioner

Dawn Adams, JD
Assistant Commissioner
Health and Human Services Commission

Meenakshi Garg, MD, MPH
Director, Chronic Disease
Prevention and Control

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INTRODUCTION

Diabetes is a serious, costly and growing public health problem in the United States and Indiana. Diabetes mellitus is a group of diseases characterized by high levels of glucose (sugar) in the blood, resulting from defects in insulin production, insulin action, or both. Insulin is necessary for the body's regulation of blood glucose levels. It is a hormone produced in the pancreas and contributes to the metabolism of sugars, starches, and other foods into energy. Without a properly functioning insulin signaling system, blood glucose levels become elevated and other metabolic abnormalities occur, leading to the development of medical complications. These complications may lead to diminished quality of life, disability, or even death.

The World Health Organization estimates that the number of adults in the United States with diabetes will double by the year 2030.[1] Nationally, the prevalence of diabetes has reached epidemic levels and has been increasing by almost 5% each year since 2000.[2] In Indiana, the prevalence of diabetes has also grown, increasing by over 50% from 2000 to 2009.[3]

Types of Diabetes

Type 1 diabetes, formerly known as juvenile-onset diabetes or insulin-dependent diabetes mellitus, most often appears during childhood or adolescence and accounts for 5-10% of all diagnosed cases of diabetes. In type 1 diabetes, the body's immune system destroys the cells that produce insulin. Since the body produces little or no insulin, individuals with type 1 diabetes must take insulin daily to survive. Type 1 diabetes is usually diagnosed within a short time of onset because the symptoms are severe and occur rapidly.[4]

Type 2 diabetes, formerly called adult-onset diabetes or non-insulin-dependent diabetes, usually begins as insulin resistance, a disorder in which cells do not use insulin properly. Over time, the resulting inefficiency contributes to a loss of insulin production capacity by the pancreas. Type 2 accounts for 90–95% of individuals diagnosed with diabetes. Some individuals control their blood glucose by exercising regularly and maintaining a healthy diet, but many require medical intervention to achieve recommended blood glucose levels. Type 2 diabetes most often appears in individuals older than 40 years of age, but is increasingly being diagnosed in children and teens and is no longer considered a disease exclusive to adults.[4]

Gestational diabetes is a form of glucose intolerance diagnosed in 2-10% of women during pregnancy. This type of diabetes will increase a woman's risk of developing type 2 diabetes in the future, and place the child at greater risk of being overweight and developing diabetes later in life. Gestational diabetes requires treatment during pregnancy to normalize maternal blood glucose levels to avoid medical complications in the infant.[4]

Other types of diabetes may result from specific genetic conditions, immune or endocrine dysfunction, surgery, drugs, infections, or malnutrition. Such forms of diabetes only account for 1-5% of all diagnosed cases.[4]

Pre-diabetes is a term used to describe individuals who are at increased risk of developing type 2 diabetes. Individuals with pre-diabetes have higher blood sugar levels than normal, though not high enough to be diagnosed with diabetes. Pre-diabetes is characterized by impaired fasting glucose (IFG) or impaired glucose tolerance (IGT) and in some cases both. IFG is a condition in which the fasting blood sugar level is 100 to 125 milligrams per deciliter (mg/dl) after an overnight fast, and IGT is a condition where the blood sugar level is 140 to 199 mg/dl after a two-hour oral glucose tolerance test. Those with pre-diabetes are likely to develop type 2 diabetes within 10 years, unless active steps are taken to prevent or delay diabetes.[4]

Economic Impact

A major consequence of diabetes is the utilization of healthcare resources. Diabetes is an expensive chronic disease to manage. The average annual health care cost for a person with diabetes in the United States is $11,744, compared with $2,935 for a person without diabetes. Costs include regular health care visits, medications, supplies, treatment and hospitalizations for complications, and educational programs. In 2007, the total annual economic cost of diabetes in the United States was estimated at $218 billion, including $174.4 billion for diagnosed diabetes. This figure is composed of $116 billion in excess medical expenditures and $58 billion in reduced national productivity. The remaining cost resulted from $18 billion spent on undiagnosed diabetes, $25 billion for pre-diabetes, and $636 million for gestational diabetes.[5]

Of the $116 billion spent on medical expenditures, $27 billion was for diabetes-specific direct care, $58 billion was spent on complications due to diabetes, and $31 billion was associated with excess general medical care. The largest components of this spending were for inpatient hospital care (50%), medication and supplies (12%), retail medications to treat complications (11%), and physician office visits (9%). One out of every five health care dollars spent in the United States is spent on caring for an individual with diabetes while one in every ten dollars is attributed to diabetes. This cost data does not include social costs such as pain and suffering or care provided by nonpaid caregivers. The total estimated cost incurred by the state of Indiana approaches $4 billion.[5]

Both ambulatory and in-patient care contribute to the significant cost associated with diabetes care. Diabetes is the seventh leading reason for ambulatory care visits, which includes visits to health care provider offices, out-patient care and emergency services.[6] Furthermore, poorly controlled or progressive diabetes may lead to lengthy in-patient care. Nationally, the average hospital stay is 4.8 days for all diagnoses. In Indiana, the average hospital length of stay associated with diabetes is 4.9 days.[7]

Diabetes is a public health concern not only because of its significant complications and cost, but also because many cases are preventable. The Cardiovascular Health and Diabetes Section (CHDS) at the Indiana State Department of Health (ISDH) includes the Diabetes Prevention and Control Program (DPCP) which compiles and analyzes diabetes data based on the most recent mortality and morbidity data available, as well as Behavior Risk Factor Surveillance System (BRFSS) information. The majority of data available on diabetes relates to adults, and unless specified otherwise, combines type 1 and type 2 when discussing issues of prevalence.

YEAR 2020 GOALS

Indiana incorporates *Healthy People* goals into its public health strategies and activities. Broadly speaking, the DPCP strives to reduce the incidence of diagnosed diabetes, lessen the complications associated with diabetes, and lower the mortality due to diabetes. Strategies for achieving these goals include primary prevention efforts geared toward preventing or delaying the onset of type 2 diabetes and secondary prevention activities to properly manage type 1 and type 2 diabetes, while preventing complications, comorbidities, and mortality.

Several strategies are incorporated into care guidelines to achieve these goals. Improved glycemic control among individuals with diagnosed diabetes, which includes reducing the proportion of this population with hemoglobin A1C (A1C) values greater than 9% and increasing the proportion with an A1C lower than 7%. As part of this effort, the proportion of adults with diabetes who have an A1C measurement at least twice a year must increase. The A1C measures average blood glucose levels over a two to three month period, and is an important measure for assessing the effectiveness of a diabetes treatment plan. A second strategy is to increase the proportion of individuals with diabetes who monitor their own blood glucose-levels at least once a day. A final diabetes- specific strategy is to increase the proportion of individuals with diagnosed diabetes who receive formal diabetes education.

Additional management activities are associated with related health issues and common complications of diabetes. Because of associated cardiovascular risk factors, improved blood lipid and blood pressure control are desired. Due to the high risk of poor wound healing, it is important that there is an increase in the proportion of individuals with diabetes who annually have a foot examination. Also, since oral, renal and vision problems are common in individuals with diabetes, increases in rates of annual dental exams, annual urinary micro-albumin measurement, and annual dilated optical exams are desired. Detailed *Healthy People* goals and objectives can be found at www.healthypeople.gov. Specific disease-management recommendations are published by the American Diabetes Association and can be found at Living with Diabetes.

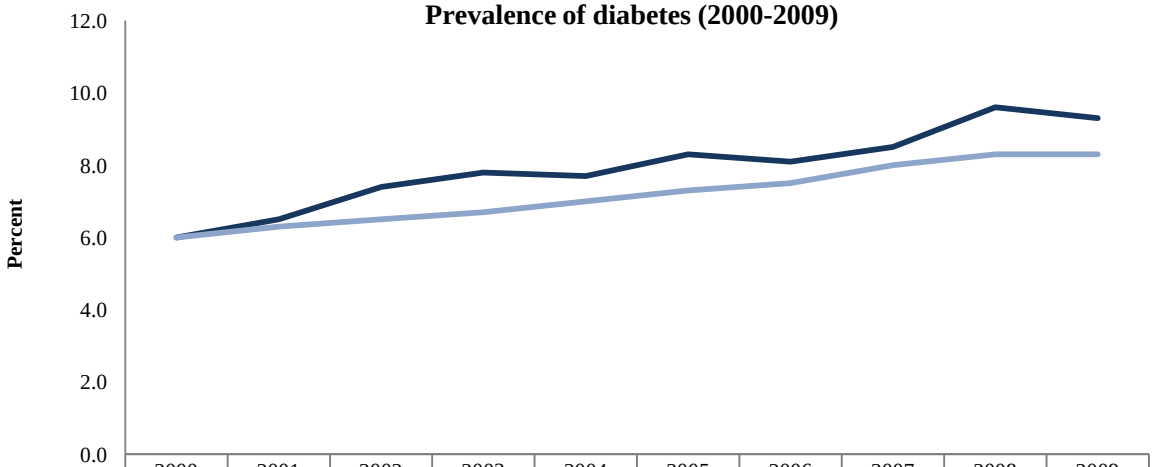
Prevalence

In 2009, an estimated 9.3% of the adult population in Indiana, over 447,000 individuals, reported that they had been diagnosed with diabetes. This rate exceeds the diabetes prevalence of the United States, 8.3%. This current rate is reflective of a long term trend of state and national increases in diabetes prevalence. Indiana's age-adjusted diabetes prevalence increased by over 50% during the period from 2000 to 2009 (Figure 1).[3,8]

Based on national findings, it is estimated that over 3% of Indiana's adult population has undiagnosed diabetes. A further issue of concern stems from the growing number of individuals with IGT or IFG, which places them at risk for developing type 2 diabetes. Research estimates that 35% of U.S. adults, 20 years or older, fall into this classification, which is referred to as pre-diabetes. In addition to the diabetes risk, there is higher risk of heart disease and stroke.[2,4,9] As people develop diabetes, medical and lifestyle interventions are typically necessary to optimize health outcomes. Lack of interventions or unsuccessful interventions often results in poorly controlled diabetes, which frequently leads to serious complications and higher health care costs.

National information provides insight into patterns of complications due to diabetes. Hypertension can be found in 66.7% of adults with diabetes. This, along with other factors, contributes to adults with diabetes experiencing rates of heart disease mortality and stroke incidence that are two to four times higher than in adults without diabetes. Diabetes is the leading cause of kidney failure, accounting for 44% of all new cases in 2008. Diabetes is also the leading cause of new cases of blindness among adults. Another consequence of diabetes is the potential for nervous system damage. Mild to severe neuropathy is found in 60-70% of individuals with diabetes. This may result in impaired sensation or pain in the feet or hands, slowed digestion of food, carpal tunnel syndrome, erectile dysfunction, and other nerve problems. Severe forms of nerve disease can lead to amputations, with more than 60% of non-traumatic lower extremity amputations occurring in individuals with diabetes.[2]

Figure 1.



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
IN	6.0	6.5	7.4	7.8	7.7	8.3	8.1	8.5	9.6	9.3
US	6.0	6.3	6.5	6.7	7.0	7.3	7.5	8.0	8.3	8.3

Data Source: Behavioral Risk Factor Surveillance System, Indiana State Department of Health

Hospitalization

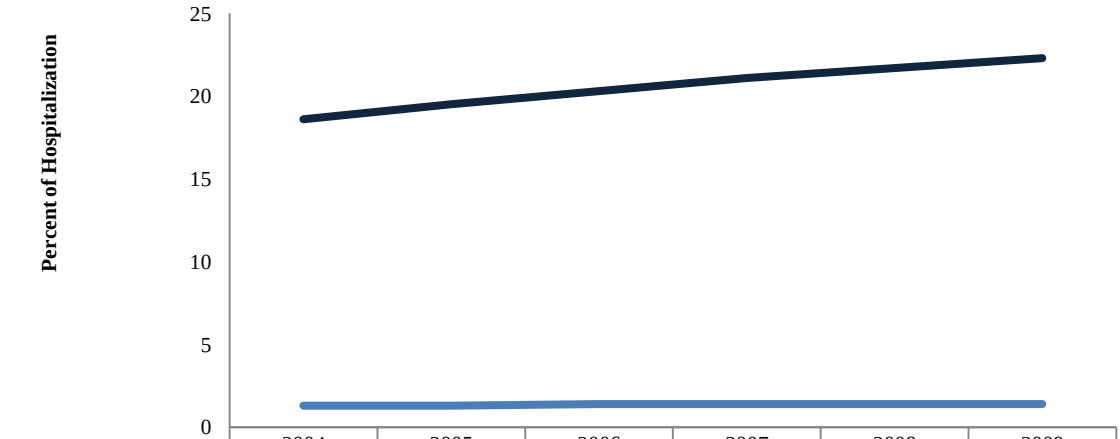
In those individuals with poorly controlled diabetes, complications which require hospitalization may arise. Examples of such complications include biochemical imbalances, renal failure, and amputations. Biochemical problems such as ketoacidosis and nonketotic hyperosmolar coma are very serious and may result in death. Renal failure typically requires dialysis or kidney transplant before waste products can be effectively filtered from circulating blood. Despite the increase in the prevalence of diagnosed diabetes from 2004 to 2009, the percentage of hospitalizations with diabetes as the primary diagnosis remained relatively flat during that same time period (Figure 2).[2,10]

Common complications of diabetes	
• Heart disease	• Stroke
• Hypertension	• Vision problems
• Kidney disease	• Nervous system disease
• Amputations	• Dental disease
• Pregnancy complications	• Depression
• Biochemical imbalance	• Susceptibility to infection

However, since diabetes is often associated with multiple co-morbidities and complicates many health outcomes, it may be part of an individual's overall hospital diagnostic profile, although not their primary diagnosis. For example, in 2009, 16% of individuals with diabetes reported having had a heart attack, and 8.7% reported having had a stroke.[3] Hospitalizations with diabetes diagnoses of any type have increased in recent years (Figure 2). In 2009, such hospitalizations accounted for 22.3% of all inpatient discharges.[10]

Figure 2.

Diabetes associated hospitalization (2004-2009)



	2004	2005	2006	2007	2008	2009
primary diagnosis	1.3	1.3	1.4	1.4	1.4	1.4
any diagnoses	18.6	19.5	20.3	21.1	21.7	22.3

Data Source: Hospital Discharge Data, Indiana Hospital Association

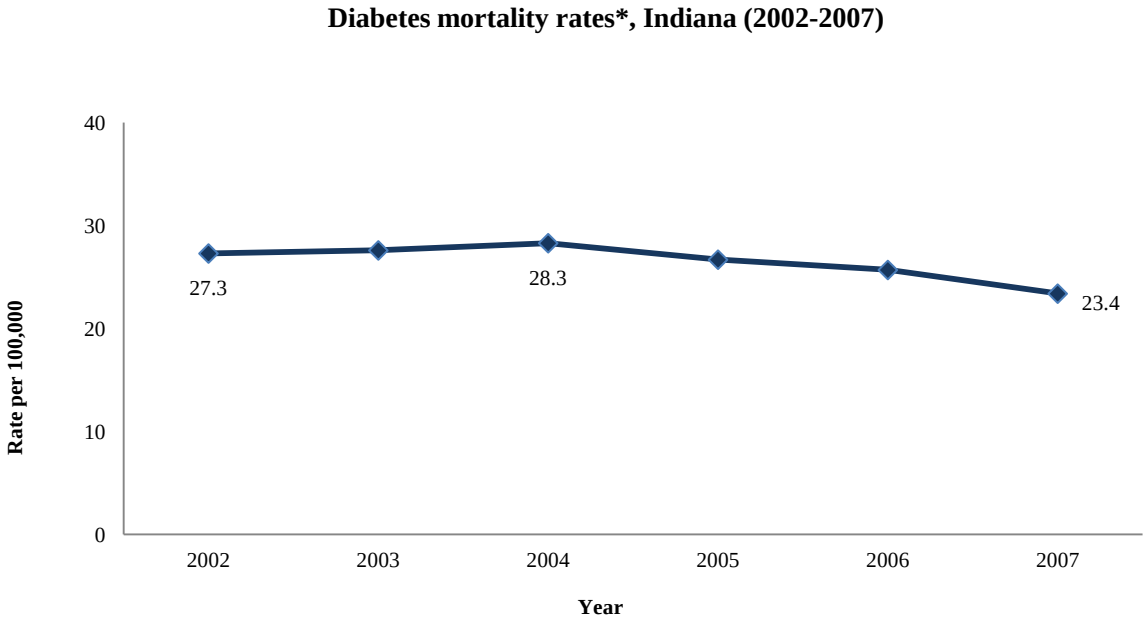
Mortality

While most diabetes complications impact quality of life, several can lead to pre-mature mortality. Diabetes can also lead to death even in those who have not developed complications. In 2007, diabetes was the seventh leading cause of death in the United States. This ranking was based on the 73,507 death certificates that identified diabetes as the underlying cause of death. According to death certificate reports, diabetes contributed to 233,619 deaths in the United States. However, this number is likely to be underreported, because studies have found that only 35-40% of decedents with diabetes had it listed anywhere on the certificate, and only 10-15% had it listed as the underlying cause of death. Cardiovascular complications are the leading cause of mortality and long-term morbidity for individuals with diabetes. [3,11]

The overall age-adjusted diabetes mortality rate in Indiana for 2007 was 23.4 per 100,000 adults. Indiana mortality rates from diabetes as an underlying cause of death have gradually decreased in recent years (Figure 3). [11]

Mortality data in this report came from death certificates that listed diabetes as the underlying cause of death, meaning that diabetes was the disease which initiated the chain of morbid events leading directly to death. This is a small portion of the number of deaths where diabetes played a role. Overall, the risk of death among individuals with diabetes is almost twice that of individuals of similar age, but who do not have diabetes. [2,11]

Figure 3.



Data Source: Indiana Vital Records, Indiana State Department of Health
*Age-adjusted rate per 100,000 population

Geographic Distribution

Current diabetes data in Indiana does not offer county level prevalence. However, county level estimates have been developed using BRFSS data and population statistics by the Centers for Disease Control and Prevention (CDC) (Table 1). Currently, every county in Indiana has an estimated diabetes prevalence higher than the national rate of 8.3%. Since these values are model-based estimates, the rates are not used to rank the counties.[3,12]

Table 1. Indiana county-level prevalence estimates for adult diabetes

County	Diagnosed Diabetes (%)	County	Diagnosed Diabetes (%)	County	Diagnosed Diabetes (%)
Adams	8.7	Hendricks	8.8	Pike	9.1
Allen	9.5	Henry	9.0	Porter	9.2
Bartholomew	9.1	Howard	9.8	Posey	9.1
Benton	9.1	Huntington	9.6	Pulaski	9.0
Blackford	9.6	Jackson	9.0	Putnam	9.0
Boone	9.4	Jasper	8.8	Randolph	9.4
Brown	9.0	Jay	8.9	Ripley	8.9
Carroll	9.5	Jefferson	8.8	Rush	8.8
Cass	9.0	Jennings	8.8	Scott	9.4
Clark	9.2	Johnson	8.7	Shelby	9.4
Clay	8.4	Knox	8.6	Spencer	9.0
Clinton	10.7	Kosciusko	9.3	St. Joseph	8.9
Crawford	9.4	LaGrange	9.2	Starke	9.6
Daviess	9.1	Lake	10.3	Steuben	9.6
Dearborn	8.8	LaPorte	10.0	Sullivan	9.0
Decatur	8.9	Lawrence	9.6	Switzerland	9.3
DeKalb	8.9	Madison	9.8	Tippecanoe	9.0
Delaware	9.8	Marion	9.8	Tipton	9.1
Dubois	8.5	Marshall	8.6	Union	8.9
Elkhart	9.5	Martin	9.1	Vanderburgh	8.7
Fayette	9.0	Miami	9.3	Vermillion	9.3
Floyd	9.2	Monroe	8.9	Vigo	9.2
Fountain	8.6	Montgomery	9.0	Wabash	9.1
Franklin	9.5	Morgan	9.1	Warren	9.5
Fulton	9.2	Newton	9.1	Warrick	8.7
Gibson	8.7	Noble	8.8	Washington	9.2
Grant	9.2	Ohio	9.2	Wayne	8.5
Greene	9.3	Orange	9.7	Wells	8.8
Hamilton	8.5	Owen	9.0	White	9.1
Hancock	8.9	Parke	9.2	Whitley	8.5
Harrison	9.5	Perry	8.7		

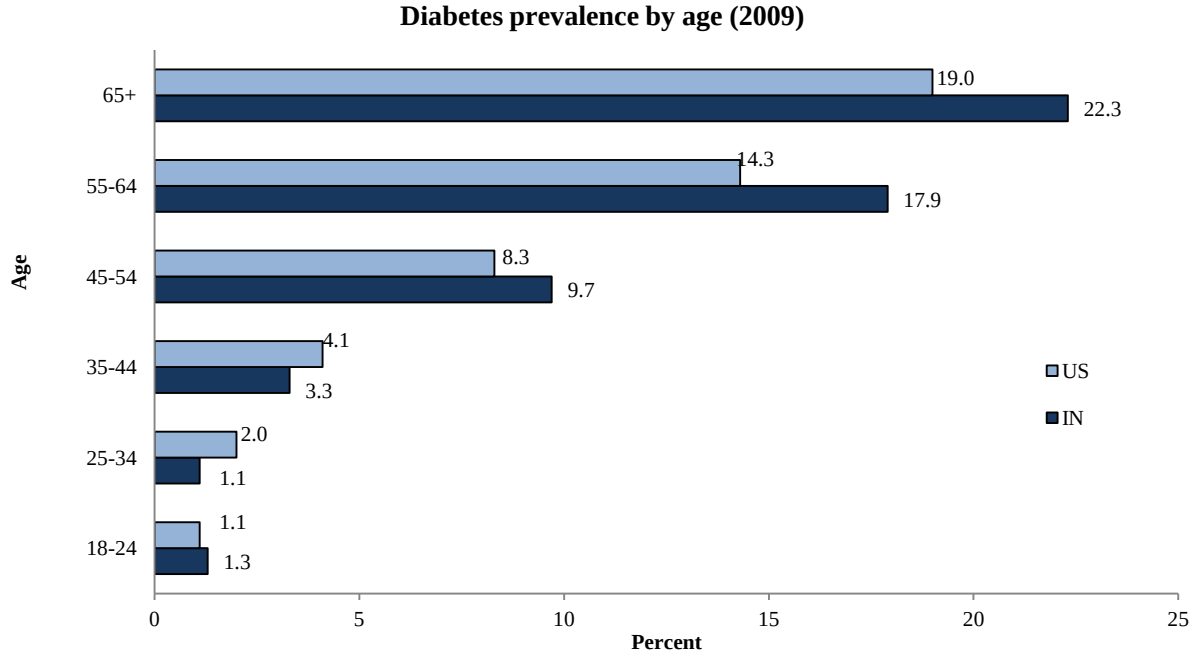
Data Source: Centers for Disease Control and Prevention, BRFSS

Despite advances in diabetes care, some populations experience the disease at higher rates or at greater severity than the general population. While disparities in health are often associated with race and ethnicity, they can also be associated with numerous factors, including age, gender and socioeconomic status. It is important to comprehensively understand all social determinants of health in order to plan public health interventions and inform public health decisions such as planning and resource allocation.

Age

In Indiana, individuals 65 years and older currently have the highest diabetes prevalence, 22.3%, of all age groups (Figure 4). The majority of adults with diabetes reported that they were first diagnosed between 46 and 60 years of age, which has remained consistent since 2006.[3] However, recent trends indicate that prevalence in younger populations is increasing. This is primarily due to the increased incidence of type 2 diabetes. Diabetes is the fourth leading cause of death among Indiana residents aged 55-64 years and the fifth leading cause of death for those 65 years and older.[11]

Figure 4.



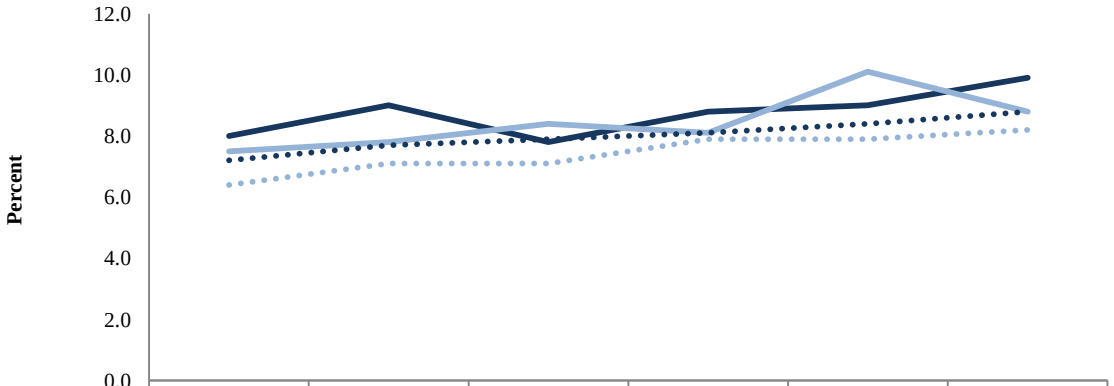
Data Source: Behavioral Risk Factor Surveillance System, Indiana State Department of Health

Gender

In 2009, the estimated prevalence of diabetes in adult females in Indiana was 8.8%, while that of adult males was 9.9%. Both genders maintain rates higher than U.S. estimates. These values represent an overall increase in diabetes prevalence between 2004 and 2009 (Figure 5).[3,8] Males have a higher age-adjusted mortality rate (25.9 per 100,000) than females (21.3 per 100,000) (Figure 6).[11]

Figure 5.

Diabetes prevalence in adults by gender

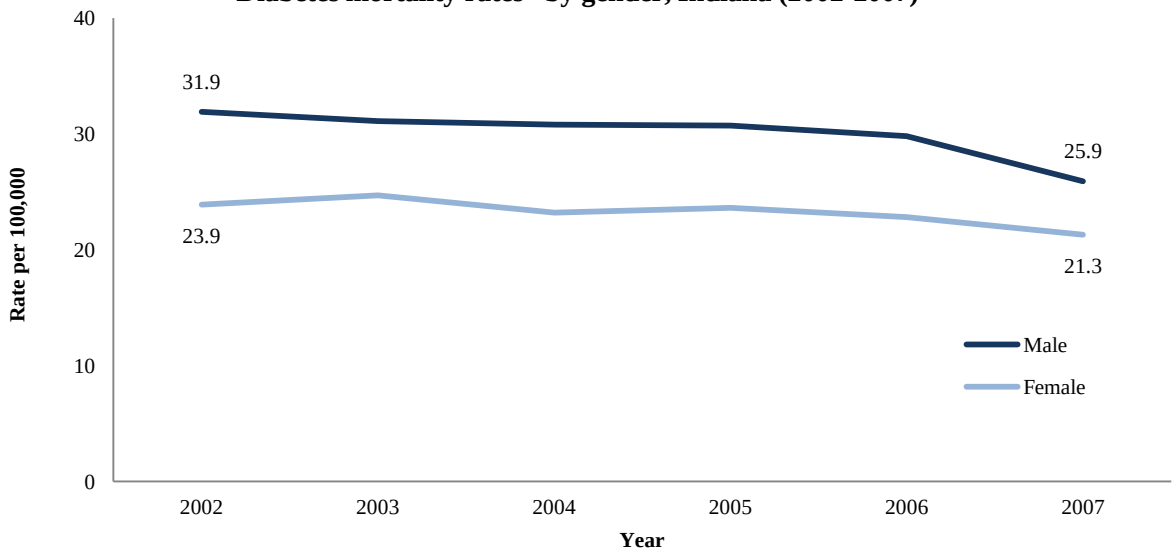


	2004	2005	2006	2007	2008	2009
IN-Males	8.0	9.0	7.8	8.8	9.0	9.9
IN-Females	7.5	7.8	8.4	8.1	10.1	8.8
US-Males	7.2	7.7	7.9	8.1	8.4	8.8
US-Females	6.4	7.1	7.1	7.9	7.9	8.2

Data Source: Behavioral Risk Factor Surveillance System, Indiana State Department of Health

Figure 6.

Diabetes mortality rates* by gender, Indiana (2002-2007)



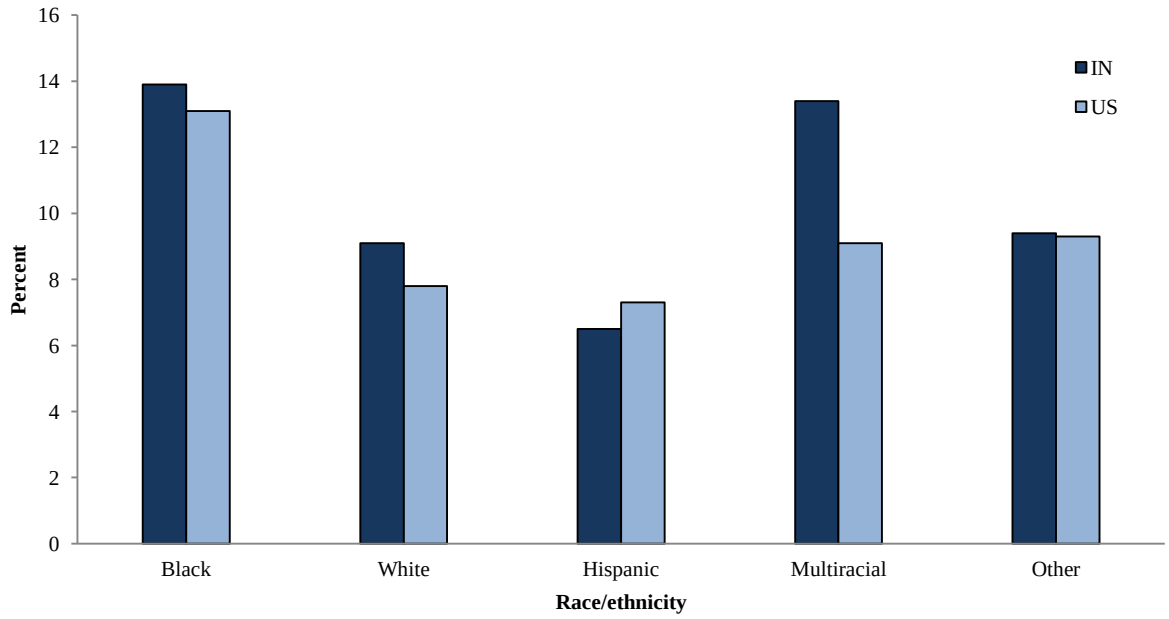
Data Source: Indiana State Department of Health, Vital Records
*Age-adjusted rates, per 100,000 population

Race/Ethnicity

Non-Hispanic blacks in Indiana are at higher risk of having diabetes, developing complications, and dying from the disease at earlier ages when compared to their non-Hispanic white counterparts. According to estimates from the 2009 BRFSS, non-Hispanic blacks in Indiana have a diabetes prevalence of 13.9%, while non-Hispanic whites have a prevalence of 9.1% (Figure 7). Non-Hispanic whites and non-Hispanic blacks in Indiana have higher diabetes prevalence than national estimates; however these differences were not significant. When compared over time, nearly all racial and ethnic groups demonstrate an increase in diabetes prevalence.[3,8]

Figure 7.

Diabetes prevalence by race/ethnicity, Indiana and U.S. (2009)

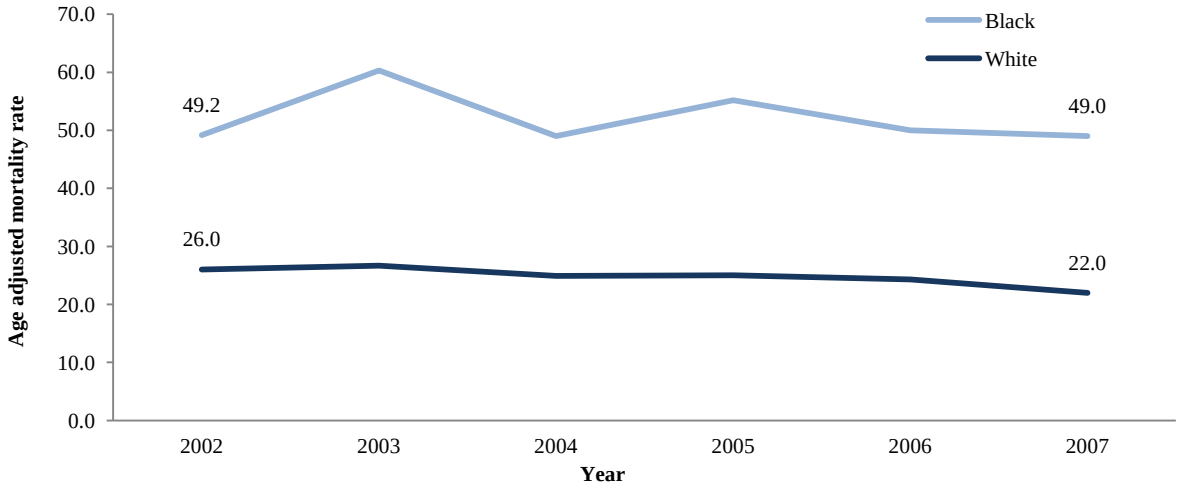


Data Source: Behavioral Risk Factor Surveillance System, Indiana State Department of Health

In 2007, diabetes was the fourth leading cause of death for non-Hispanic blacks, third for Asian/Pacific Islanders, seventh for non-Hispanic whites, and eighth for Hispanics in Indiana. The number of deaths in the non-Hispanic white population is higher than in the non-Hispanic black population. However, when comparing diabetes mortality rates, the non-Hispanic black rate was almost twice as high as the non-Hispanic white rate (Figure 8). Although the age-adjusted death rate for Hispanics in 2006 was 25.7 per 100,000, a small response rate in 2007 renders the data insufficient for comparative analysis. When comparing rates from 2002 through 2007, non-Hispanic black males and females have the highest mortality rates (Figure 9). Non-Hispanic whites of both genders have displayed relatively stable mortality rates over this time period despite the growing prevalence of diabetes.[11]

Figure 8.

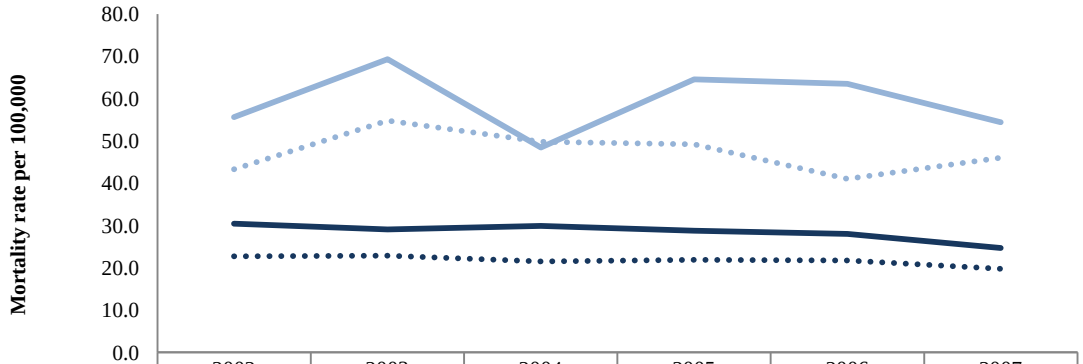
Diabetes mortality rates by race*, age-adjusted, Indiana (2002-2007)



Data Source: Indiana State Department of Health, Vital Records
*Age-adjusted rates, per 100,000 population

Figure 9.

Diabetes mortality rates by race and gender*, Indiana (2002-2007)



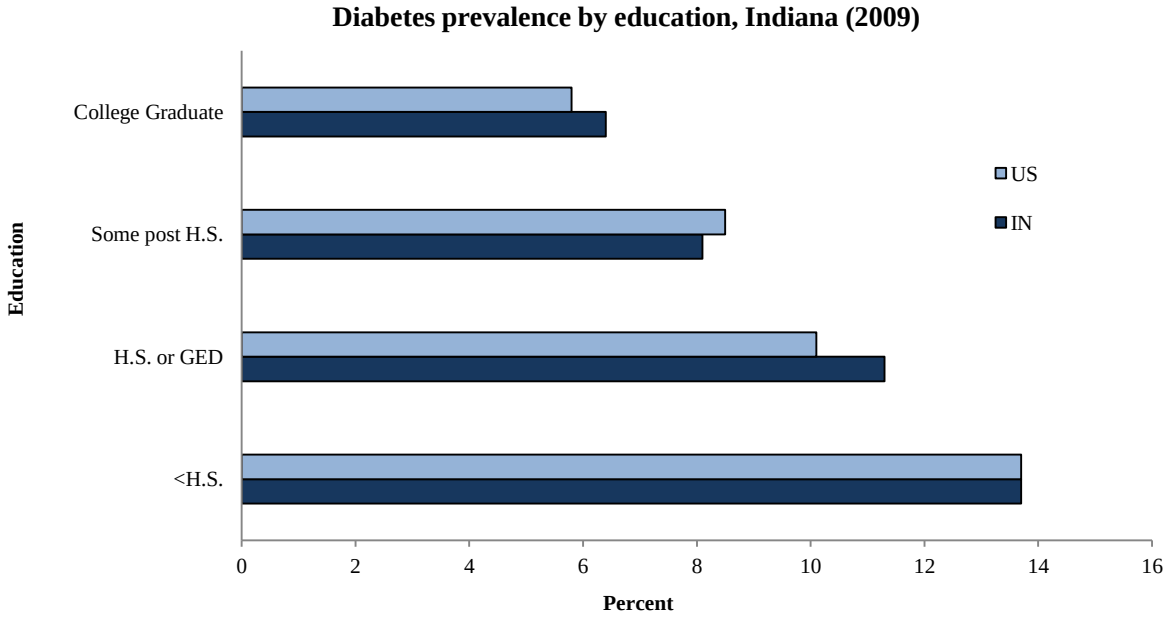
	2002	2003	2004	2005	2006	2007
Females-Black	43.3	54.8	49.8	49.2	41.0	46.0
Females-White	22.7	22.9	21.5	21.9	21.7	19.8
Males-Black	55.6	69.3	48.4	64.5	63.5	54.4
Males-White	30.4	29.1	29.9	28.8	28.0	24.7

Data Source: Indiana State Department of Health, Vital Records
*Age-adjusted rates, per 100,000 population

Education and Income

The prevalence of diabetes is associated with education and income level. In 2009, the prevalence of diabetes was greatest among adults with less than a high school diploma, 13.7%, and the prevalence was the lowest, 6.4%, among those with a college degree (Figure 10). The differences between educational attainment and diabetes prevalence are significant, and this trend in Indiana has been consistent over time and consistent with national trends.[3]

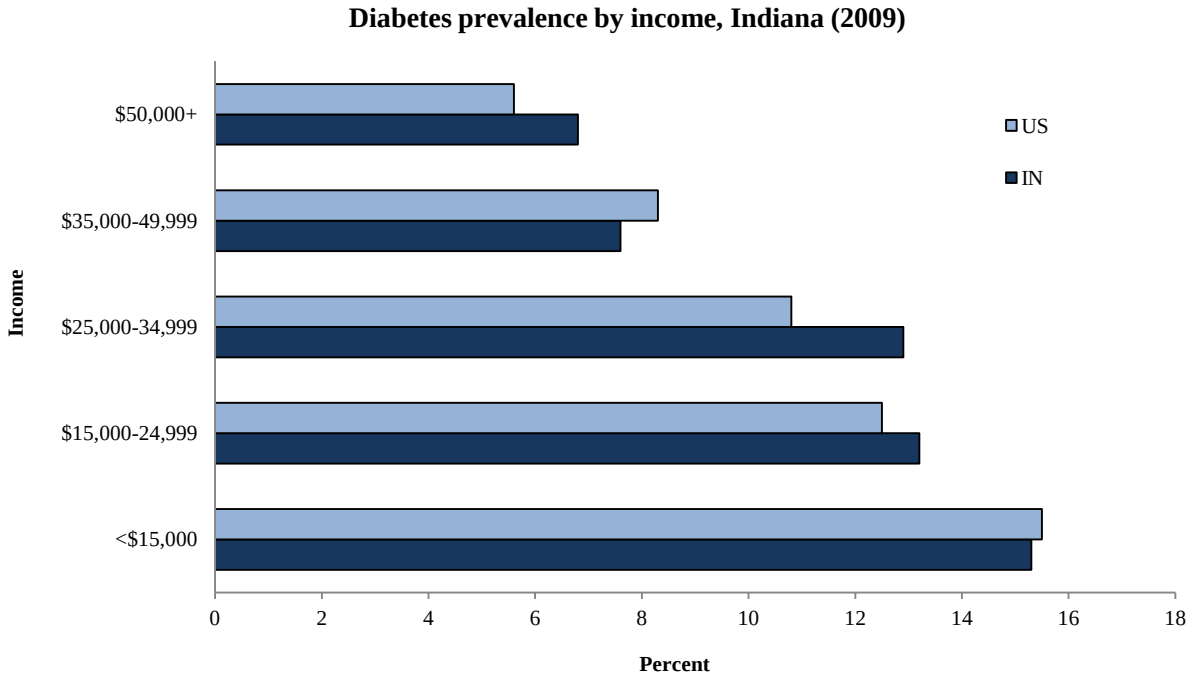
Figure 10.



Data Source: Behavioral Risk Factor Surveillance System, Indiana State Department of Health

Individuals with lower income exhibit a higher prevalence of diabetes. In addition to individual income, household income is a predictive factor.[13] Individuals in lower income households are more likely to have diabetes compared to their higher income peers, which is consistent with national data. In 2009, the prevalence for those with an annual household income (from all sources) of less than $15,000 was 15.3% compared to only 6.8% prevalence in those that had a yearly income of $50,000 or higher (Figure 11).[3]

Figure 11.



Data Source: Behavioral Risk Factor Surveillance System, Indiana State Department of Health

The exact mechanisms for developing either type 1 or type 2 diabetes are unclear, although it appears to differ for each form of the disease. Risk factors for type 1 include autoimmune, genetic, and environmental factors. Possible explanations for the onset of type 1 diabetes are environmental triggers which stimulate an immune response against the insulin-producing pancreas. Risk factors for type 2 diabetes include both genetic and lifestyle factors that are classified as either non-modifiable or modifiable. Non-modifiable risk factors for type 2 diabetes include gender, age, and genetic factors such as race/ethnicity. Additionally, family history is highly predictive for type 2 diabetes. Modifiable risk factors include obesity, physical inactivity, tobacco use and dietary habits. Although less clear, education and income levels play a role in type 2 diabetes, as those with lower education and income tend to have a higher prevalence of diabetes.[4,13,14]

Although these factors are considered distinct classifications, interactions can occur between the two. For example, genes can predispose an individual to developing diabetes but may require environmental and behavioral factors for activation. Consequently, the development of type 2 diabetes is not inevitable, and may be prevented or delayed with effective intervention.[15,16,17]

Obesity and overweight are significant risk factors for the development of type 2 diabetes. Additionally, women who give birth to large-for-gestational-age* babies are at increased risk of developing type 2 diabetes later in life. Other factors worth noting include low birth weight, exposure to a diabetic environment *in utero*, and inflammatory response, but additional research is needed in these areas to clarify the mechanisms that lead to disease onset.[15,16]

Women who experience gestational diabetes are an additional high-risk population. Research has shown that the risk of developing type 2 diabetes increases with time, and is almost ten times greater for women who had gestational diabetes than those who did not. The cumulative risk of developing type 2 diabetes for those women is 25.8% at 15 years post-diagnosis.[18] Information from vital records offers a broader assessment of gestational diabetes in Indiana than the BRFSS, as it includes all female residents who gave birth during the calendar year. In 2007, there were 3,989 births where the mother was diagnosed with gestational diabetes, which accounted for 4.45% of births in Indiana.[19]

Clinical research has shown that type 2 diabetes can be delayed, or even prevented, in high-risk populations by lifestyle modification which includes dietary alteration, exercise and moderate weight loss.[17,20,21] Further investigation is needed to determine how such interventions may influence diabetes complications and co-morbidities.[22] A significant contributing factor to the success of lifestyle intervention is the early identification of those with pre-diabetes, or those who are generally at high-risk for the development of type 2 diabetes.[23]

Common risk factors for diabetes	
• Pre-diabetes	• Age over 45 years
• Family history of diabetes	• Overweight or obese
• Physical inactivity	• High blood pressure
• Low HDL and high triglycerides	• Certain racial and ethnic groups
• Pregnancy complications	• Women who have had gestational
• Biochemical imbalance	diabetes

*Birth weight at or above 90th percentile for given gestational age

Diabetes can affect many parts of the body and can lead to serious complications if not managed well. A team-based health care approach for the care and treatment of individuals with diabetes is best. The individual should also take an active role in self-management. It is important for individuals with diabetes to learn about their condition, treatment goals, and preventive measures. Self-management courses, active engagement with a physician, and diabetes educators are resources which can assist those affected by diabetes and those at high risk of developing the disease. Due to common comorbidities, many individuals with diabetes need to take medication to control high blood pressure and cholesterol in addition to medication to control blood glucose levels. Controlling blood glucose, blood pressure, and blood lipids may reduce the likelihood of developing complications.[14,15,16]

Prevention

The onset of type 2 diabetes is not an inevitability of age. A key component of improving the outcomes associated with type 2 diabetes is preventing or delaying the onset of the disease. Intervention with at-risk individuals or those who have been diagnosed with pre-diabetes is an important key to modifying diabetes morbidity and mortality. Currently, 35% of the adult population in the United States is estimated to have pre-diabetes.[2] However, pre-diabetes research indicates that as few as 7.3% of adults reported being informed that they had pre-diabetes.[24] This disparity in awareness may make targeting interventions difficult. Strategies for preventing type 2 diabetes include maintaining a healthy weight, eating a healthy diet, and exercising at least 150 minutes a week. Lifestyle changes coupled with weight loss of 5-7% has been shown to reduce the risk of onset of type 2 diabetes by 58%.[17,18]

The concept of prevention is not limited to the prevention of disease onset. Initiation of lifestyle and medical interventions is important to achieve optimal health outcomes. As mentioned earlier, approximately 25% of individuals with diabetes are undiagnosed.[2] To optimize the impact of care, it is crucial to identify these individuals and bring them into a care setting and initiate intervention. Once identified, the care for individuals with diabetes focuses largely on mechanisms that will prevent the development of complications such as cardiovascular disease, blindness, neuropathy and renal disease. In addition to lifestyle changes, medical intervention to maintain blood glucose, blood lipids and blood pressure at optimal levels is often initiated. Also, specialized monitoring and treatment protocols are recommended for the prevention of specific negative outcomes, including wound care, vision assessment, and kidney monitoring.[14] Further details on targets and protocols for treatment and monitoring can be found in subsequent sections.

Treatment Goals

Individuals with diabetes should receive medical care from a physician-coordinated team of health care professionals. There are specific steps that should be taken during an individual's lifetime in order to maintain health and avoid diabetic complications. Appendix A outlines recommended treatment strategies that are used to guide health care professionals when working with individuals who have diabetes. Comprehensive diabetes management focuses on the "ABCs": A1C, blood pressure, cholesterol, and smoking cessation. Each of these items is important for managing diabetes and improving long-term health outcomes. Specific recommendations for clinical management of all forms of diabetes are published annually by the Professional Practice Committee of the American Diabetes Association as the *Standards of Medical Care in Diabetes*. [14]

Glucose Control

Studies have shown that improved glucose control benefits individuals with type 1 and type 2 diabetes. For every percentage point drop in A1C blood test results, the risk of micro-vascular complications, such as eye, kidney, or nerve disease, is reduced by 40%.[4] Individual treatment goals include achieving A1C results as close to normal (<6% in individuals without diabetes) as possible without significant hypoglycemia. Less stringent goals are set for those with severe or frequent hypoglycemia, advanced microvascular or macrovascular complications, limited life expectancy, or other significant comorbidities. Daily glucose checks and A1C testing (twice a year at least three months apart if meeting treatment goals and quarterly if not meeting goals) helps those with diabetes monitor their glucose levels so they know if, and when, adjustments are necessary.[14]

According to the 2009 BRFSS, 67% of Indiana adults with diabetes reported checking their glucose level at least once a day. However, 24.1% failed to check their glucose levels daily, and 9% never checked their levels.[3] Over 84% of adults with diabetes reported having received the A1C test in the previous year. Almost 16% of those surveyed did not know when they last had the test or have never heard of the test.[3]

A key component of treatment for most people with diabetes is medical management through pharmacologic therapy. The recommended therapy for most individuals with type 1 diabetes is multiple daily doses of insulin. Treatment for type 2 diabetes includes a healthy diet, regular exercise, and oral medications. Those with type 2 diabetes may take insulin as well, alone or in combination with oral medications. As with primary prevention, attaining and maintaining a healthy weight is beneficial for successful treatment of diabetes.[14]

Among Indiana adults with diabetes, oral medications were the most common form of treatment (72.6%). Insulin was used by 29.4%. A combination of therapies was used by 57.3% of individuals. However, 21.0% did not use either insulin or oral medications. The type of treatment used by adults in Indiana with diabetes has remained consistent over time.[3]

Blood Pressure and Lipid Control

Hypertension and dyslipidemia commonly occur with type 2 diabetes and contribute to negative health outcomes. Controlling blood pressure among individuals with diabetes helps to reduce macrovascular complications of diabetes, including reducing the risk of heart disease and stroke by 33-50%. It also reduces the risk of microvascular complications (eye, kidney, and nerve diseases) by about 33%. For every 10 mmHg reduction in systolic blood pressure, the risk of complications is reduced by 12%.[4,14] Of Indiana adults with diabetes, 71.8% of adults with diabetes have high blood pressure.[3] Improving cholesterol or blood lipids can reduce cardiovascular complications by 20-50%.[2,4,14] Of Indiana adults with diabetes, 68.3% reported that they had high cholesterol.[3]

Kidney Disease Management

Diabetic nephropathy is a common long-term complication of diabetes. Damage to the kidneys results in the inability of the body to properly filter waste from the blood. When the kidneys fail, dialysis is necessary to filter the blood. Diabetes is the primary cause of kidney failure. Good glycemic control and early detection and treatment of diabetic kidney disease by lowering blood pressure can reduce the decline in kidney function by 30-70%.[4] Annual tests to monitor kidney damage (urine albumin-to-creatinine ratio) and kidney function (glomerular filtration rate) are recommended.[14]

Regular Visits to Health Care Providers

Diabetes is a complex disease which requires a comprehensive treatment protocol. It is important for individuals with diabetes to see a health care professional regularly to monitor their disease and to detect and prevent complications. According to the 2009 BRFSS, an estimated 86.9% of Indiana adults with diabetes saw a health care professional for their diabetes at least once in the previous year. However, 13.4% reported not seeing any health care professional in the previous year.[3]

Self-Management

Because of its complexity, individuals with diabetes who are actively engaged with a management plan and a coordinated care team improve their chances for positive outcomes. Diabetes self-management education is a means to facilitate such engagement. Diabetes self-management classes are essential for helping those with diabetes understand their condition and how to care for themselves. These courses are offered at local health departments, clinics, hospitals and in community settings. Topics include understanding diabetes and its effects on the body; monitoring blood glucose; nutrition; understanding the role of medications; exercise and the importance of maintaining a healthy weight; preventing complications by detecting problems early; proper foot, skin, and dental care; and working with health care providers. The current best practice involves a skill-based approach that focuses on assisting those with diabetes to make informed self-management decisions.[14] In 2009, 60.5% of Indiana adults with diabetes reported that they had ever taken a course or class to help them manage their diabetes at some time since their diagnosis.[3]

Eye Exams

Individuals with diabetes are at increased risk of vision problems, including blindness. Diabetes is the leading cause of blindness among adults aged 20-74.[2] Most individuals with diabetes eventually develop some form of retinopathy. Early detection and treatment of diabetic eye disease can reduce the development of severe vision loss by 50-60%.[14,25,26] A key component to achieving this result is regular eye exams. Recommendations suggest that individuals with diabetes see an eye care professional each year for a dilated eye exam. In 2009, 70.1% of Indiana adults with diabetes reported having a dilated eye exam in the previous year. Only 4.1% had never had a dilated eye exam. However, 15.5% of respondents stated that it had been more than two years since their last exam.[3]

Foot Exams

Regular comprehensive foot exams can reduce amputation rates by 45-85%.[2] In 2009, 73.6% of Indiana adults with diabetes reported that they had at least one foot exam performed by a health care professional in the previous year. In addition to seeing a doctor for a yearly foot exam, recommendations suggest that adults with diabetes check their feet daily for sores or irritations to reduce the risk of infection and amputation. In 2009, 83.2% of Indiana adults with diabetes checked their feet daily or weekly. However, 10.2% never check their feet.[3]

Dental Exams

Regular dental exams are important to detect and prevent periodontal disease.[2] Poor glycemic control may complicate oral health, and conversely periodontal disease may hinder diabetes management.[27] Although individuals with diabetes are at a higher risk of having dental disease, they are less likely to receive regular dental care. In 2008, only 53.8% of Indiana adults with diabetes reported that they had a dental exam in the previous year, compared to 67.9% in those without diabetes.[3]

Other Preventive Measures

Overall, individuals with poorly controlled diabetes are more susceptible to illness, and once they become sick, they often have a worse prognosis. For example, those with diabetes are more likely to be hospitalized or die because of pneumonia or influenza than individuals without diabetes.[2] Individuals with diabetes have worse outcomes when they become ill with influenza and/or pneumonia compared to the general population. Consequently, yearly influenza vaccinations and a pneumonia vaccination are recommended to help to prevent illness. Smoking cessation, regular exercise, a healthy diet, and maintaining a healthy weight are also important for reducing complications. Additionally, there are several other components to comprehensive diabetes care: aspirin therapy to reduce cardiovascular risk, depression management, and neuropathy management.[14, 27]

Diabetes represents a tremendous challenge for Indiana and the United States. The World Health Organization estimates that the number of adults in the United States with diabetes will double by the year 2030.[1] The rates of obesity and diabetes are on the rise in Indiana, as well as, the rate of individuals developing complications due to diabetes. Diabetes-related mortality and morbidity, amputations, blindness, and kidney disease cause needless suffering and unnecessary financial burden on individuals and Indiana's economy. The DPCP works to remove barriers associated with preventing, detecting and managing diabetes, and supports initiatives to improve the health outcomes and quality of life of those with diabetes and those at-risk for developing diabetes.

The DPCP's mission is to reduce the burden of diabetes in Indiana through data surveillance, health systems development, health communications, and the development and implementation of community interventions and programs. To achieve its mission, the DPCP works closely with the Indiana Diabetes Advisory Council (DAC), a group composed of clinicians, state agencies, health insurers, not-for-profit organizations, commercial enterprises, resource providers, advocacy groups and concerned citizens. The focus of the DAC is to increase public awareness of the impact of diabetes, to improve the quality of life for those who are affected by diabetes, to improve the quality of care for patients with diabetes, and to reduce the burden imposed by diabetes in Indiana. Currently the DAC is developing a strategic plan to guide Indiana's diabetes efforts.

A primary function of the DPCP is to provide technical assistance to entities interested in addressing diabetes. This is achieved through assisting in program development, evaluation and outcome analysis, as well as support in applying for grants. Additionally, the DPCP serves as a resource for organizations, local coalitions and media outlets, in an effort to provide accurate diabetes information to the public. The DPCP also supports the implementation of several interventions throughout the state that attempt to address areas of health inequity:

Living a Healthy Life with Chronic Conditions is a chronic disease self management program developed by the Stanford University's Patient Education Research Center. The program is a six session evidence-based workshop delivered in community settings. People with chronic health problems, including diabetes, attend together. Workshops are facilitated by non-health professionals who have received specific training to deliver this program. The subjects covered include: coping techniques, appropriate exercise for maintaining and improving strength, flexibility, and endurance, appropriate use of medications, communication skills, nutrition, and how to evaluate new treatments.[28]

Enhanced Fitness is an evidence-based exercise program designed to help older adults at all levels of fitness become more active, energized, and empowered to sustain independent lives. These activities support the concept of physical activity as a means of improving diabetes outcomes. The program focuses on stretching, flexibility, balance, low impact aerobics, and strength training exercises, tools that health professionals say that people need to maintain health and function as they grow older.

The ***Diabetes Prevention Program (DPP)*** was a major multicenter clinical research study aimed at discovering whether modest weight loss through dietary changes and increased physical activity could prevent or delay the onset of type 2 diabetes in individuals who are diagnosed with pre-diabetes. As mentioned previously, lifestyle intervention was proven to be an effective strategy for primary diabetes prevention in at-risk individuals. The intervention developed during the DPP study is now delivered in community settings, such as the YMCA. The program is lead by certified DPP instructors and meets for 16 weeks in a group setting where lifestyle goals are set for each individual. The two major goals of the DPP lifestyle intervention are to reduce and maintain individual weight loss by 5-7% through basic nutrition education, and to increase physical activity to 150 minutes per week. [17]

The ***Diabetes Empowerment Education Program (DEEP)*** was developed and evaluated by the University of Illinois at Chicago to provide community residents with the tools to better manage their diabetes in order to reduce complications and lead healthier, longer lives. Based on principles of empowerment and adult education, DEEP has two components. The *Training of Trainers Program* is a 20 hour workshop to train community health workers (lay health educators, lay health promoters) on providing diabetes education to members of their community. The training stresses the development of skills and knowledge related to diabetes by using interactive group activities and adult education methods. Once they complete the training, health workers are prepared to deliver diabetes education and self-management classes in their communities.

The second DEEP component, *The Diabetes Patient Education Program* is designed as an 8-10 week curriculum for diabetes self-management education. The curriculum is divided into eight modules covering topics that include diabetes risk factors, complications, nutrition, physical activity, use of the glucose meter and medications, building partnerships with a diabetes health care team, psychosocial effects of illness, problem-solving strategies, and how to access community diabetes resources. The curriculum is based on national medical care and diabetes self-education guidelines and recommendations, and is revised to reflect the most current knowledge and care information.

To better address additional strategies of diabetic management, Indiana has worked with the University of Illinois at Chicago to add a tobacco cessation component to the DEEP curriculum (DEEP TC). Racial and ethnic minority advocacy groups were primary participants in the revised DEEP TC curriculum.

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For further information on diabetes in Indiana or community intervention programs, please contact the ISDH Diabetes Prevention and Control Program at diabetes@isdh.in.gov. For free education materials please contact the National Diabetes Education Program at ndep.nih.gov. Additional information on diabetes can be found at the Centers for Disease Prevention and Control at cdc.gov/diabetes and the American Diabetes Association at diabetes.org.

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Appendix A.

Treatment Measures	Frequency
Measure weight and blood pressure	**Every regular physician visit**
Inspect feet	**Every regular physician visit**
Review self-monitoring glucose record	**Every regular physician visit**
Review/adjust medications to control glucose, lipids, and blood pressure	**Every regular physician visit**
Review self-management skills, dietary needs, and physical activity	**Every regular physician visit**
Assess for depression or other mood disorders	**Every regular physician visit**
Counsel on smoking cessation and alcohol use	**Every regular physician visit**
Refer to Medical Nutrition Therapy with a registered dietitian, preferably a Certified Diabetes Educator (CDE); at diagnosis, then every 6-12 months, or as needed	**Every regular physician visit**
Refer to Self-Management Education with a diabetes educator, preferably a CDE; at diagnosis, then every 6 to 12 months, or as needed	**Every regular physician visit**
Assess for aspirin therapy *(unless otherwise contraindicated)*	**Every regular physician visit**
Obtain A1C in patients whose therapy has changed or who are not meeting glycemic goals *(if meeting goals, twice a year at least 3 months apart)*	**Quarterly**
Obtain fasting lipid profile (every two years if at goal)	**Annually**
Obtain serum creatinine and estimate glomerular filtration rate	**Annually**
Perform urine test for albumin-to-creatinine ratio in patients with Type 1 diabetes ≥5 years and in all patients with Type 2 diabetes	**Annually**
Refer for dilated eye exam (if normal, an eye care specialist may advise an exam every 2-3 years)	**Annually**
Perform a comprehensive foot exam	**Annually**
Refer for dental/oral exam at least once a year	**Annually**
Administer influenza vaccination	**Annually**
Review need for other preventative care or treatment	**Annually**
Administer pneumococcal vaccination (repeat if over 64 years of age or immunocompromised and last vaccination was more than 5 years ago	**Lifetime**

Data Source: American Diabetes Association

Interactive Atlas of Heart Disease and Stroke Tables

Geographic Area

Select geographic area for report.

- (•) State report with county data. Select state: Indiana
- ( ) U.S. report with state data.
- ( ) U.S. report with county data.

Report Data

Select a tab to view different reports.

Health Indicators | Determinants of Health | Health Services

Health Indicators

Diagnosis Categories: All Heart Disease

Health Indicator: Deaths

Discharge:	Year:	Gender:	Race/Ethnicity:	Age:	Spatial Smoothing:
Discharged Home	2011-2013	All Gender	All Race	65+	Not Smoothed

Show Results

Summary Statistics | County Statistics

Indiana County Statistics

Heart Disease Hospitalization, Medicare Beneficiaries, Percentage Discharged Home, All Race, All Gender, 2011-2013

County	State	Value	Category Range
Switzerland (javascript:cdcAtlasWeb.launchDetailedReport('18155');)	IN	58.4	58.4 - 66.6 (19)
Huntington (javascript:cdcAtlasWeb.launchDetailedReport('18069');)	IN	61.4	58.4 - 66.6 (19)
Tippecanoe (javascript:cdcAtlasWeb.launchDetailedReport('18157');)	IN	61.9	58.4 - 66.6 (19)
Fayette (javascript:cdcAtlasWeb.launchDetailedReport('18041');)	IN	62.2	58.4 - 66.6 (19)
Shelby (javascript:cdcAtlasWeb.launchDetailedReport('18145');)	IN	62.7	58.4 - 66.6 (19)
Cass (javascript:cdcAtlasWeb.launchDetailedReport('18017');)	IN	62.8	58.4 - 66.6 (19)
Jefferson (javascript:cdcAtlasWeb.launchDetailedReport('18077');)	IN	62.8	58.4 - 66.6 (19)
Daviess (javascript:cdcAtlasWeb.launchDetailedReport('18027');)	IN	63.7	58.4 - 66.6 (19)

Kosciusko (javascript:cdcAtlasWeb.launchDetailedReport('18085');)	IN	63.8	58.4 - 66.6 (19)
Brown (javascript:cdcAtlasWeb.launchDetailedReport('18013');)	IN	64	58.4 - 66.6 (19)
Noble (javascript:cdcAtlasWeb.launchDetailedReport('18113');)	IN	64.1	58.4 - 66.6 (19)
Knox (javascript:cdcAtlasWeb.launchDetailedReport('18083');)	IN	64.5	58.4 - 66.6 (19)
Monroe (javascript:cdcAtlasWeb.launchDetailedReport('18105');)	IN	65.2	58.4 - 66.6 (19)
Marshall (javascript:cdcAtlasWeb.launchDetailedReport('18099');)	IN	65.6	58.4 - 66.6 (19)
Howard (javascript:cdcAtlasWeb.launchDetailedReport('18067');)	IN	66	58.4 - 66.6 (19)
Orange (javascript:cdcAtlasWeb.launchDetailedReport('18117');)	IN	66.2	58.4 - 66.6 (19)
Bartholomew (javascript:cdcAtlasWeb.launchDetailedReport('18005');)	IN	66.4	58.4 - 66.6 (19)
Johnson (javascript:cdcAtlasWeb.launchDetailedReport('18081');)	IN	66.5	58.4 - 66.6 (19)
Wabash (javascript:cdcAtlasWeb.launchDetailedReport('18169');)	IN	66.6	58.4 - 66.6 (19)
Union (javascript:cdcAtlasWeb.launchDetailedReport('18161');)	IN	66.7	66.7 - 68.3 (18)
Morgan (javascript:cdcAtlasWeb.launchDetailedReport('18109');)	IN	67.1	66.7 - 68.3 (18)
DeKalb (javascript:cdcAtlasWeb.launchDetailedReport('18033');)	IN	67.2	66.7 - 68.3 (18)
Benton (javascript:cdcAtlasWeb.launchDetailedReport('18007');)	IN	67.3	66.7 - 68.3 (18)
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Franklin (javascript:cdcAtlasWeb.launchDetailedReport('18047');)	IN	67.3	66.7 - 68.3 (18)
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Ripley (javascript:cdcAtlasWeb.launchDetailedReport('18137');)	IN	69.4	68.4 - 71.2 (20)
Marion (javascript:cdcAtlasWeb.launchDetailedReport('18097');)	IN	69.5	68.4 - 71.2 (20)
Hancock (javascript:cdcAtlasWeb.launchDetailedReport('18059');)	IN	69.9	68.4 - 71.2 (20)
Washington (javascript:cdcAtlasWeb.launchDetailedReport('18175');)	IN	69.9	68.4 - 71.2 (20)
Henry (javascript:cdcAtlasWeb.launchDetailedReport('18065');)	IN	70.1	68.4 - 71.2 (20)
Randolph (javascript:cdcAtlasWeb.launchDetailedReport('18135');)	IN	70.5	68.4 - 71.2 (20)
Spencer (javascript:cdcAtlasWeb.launchDetailedReport('18147');)	IN	70.6	68.4 - 71.2 (20)
St. Joseph (javascript:cdcAtlasWeb.launchDetailedReport('18141');)	IN	70.9	68.4 - 71.2 (20)
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Scott (javascript:cdcAtlasWeb.launchDetailedReport('18143');)	IN	71.4	71.3 - 73.5 (17)
Vigo (javascript:cdcAtlasWeb.launchDetailedReport('18167');)	IN	71.4	71.3 - 73.5 (17)
Clinton (javascript:cdcAtlasWeb.launchDetailedReport('18023');)	IN	71.6	71.3 - 73.5 (17)
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Gibson (javascript:cdcAtlasWeb.launchDetailedReport('18051');)	IN	71.8	71.3 - 73.5 (17)
Hamilton (javascript:cdcAtlasWeb.launchDetailedReport('18057');)	IN	71.9	71.3 - 73.5 (17)
Newton (javascript:cdcAtlasWeb.launchDetailedReport('18111');)	IN	72.1	71.3 - 73.5 (17)
Elkhart (javascript:cdcAtlasWeb.launchDetailedReport('18039');)	IN	72.4	71.3 - 73.5 (17)
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Decatur (javascript:cdcAtlasWeb.launchDetailedReport('18031');)	IN	72.7	71.3 - 73.5 (17)
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Interactive Atlas of Heart Disease and Stroke Tables

Geographic Area

Select geographic area for report.

- (•) State report with county data. Select state: Indiana
- ( ) U.S. report with state data.
- ( ) U.S. report with county data.

Report Data

Select a tab to view different reports.

Health Indicators | Determinants of Health | Health Services

Health Indicators

Diagnosis Categories: All Stroke

Health Indicator: Deaths

Year:	Race/Ethnicity:	Gender:	Age:	Spatial Smoothing:
2011-2013	All Race	All Gender	All Ages	Smoothed

Show Results

Summary Statistics | County Statistics

Indiana County Statistics

Stroke Death Rate per 100,000, All Ages, All Race, All Gender, 2011-2013

County	State	Value	Category Range
Monroe (javascript:cdcAtlasWeb.launchDetailedReport('18105');)	IN	31.3	31.3 - 39.5 (22)
Warrick (javascript:cdcAtlasWeb.launchDetailedReport('18173');)	IN	33	31.3 - 39.5 (22)
Porter (javascript:cdcAtlasWeb.launchDetailedReport('18127');)	IN	33.7	31.3 - 39.5

			(22)
Warren (javascript:cdcAtlasWeb.launchDetailedReport('18171');)	IN	36.3	31.3 - 39.5 (22)
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[illegible]			39.5 (22)
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Indiana Cancer Facts and Figures

2015

A Sourcebook for Planning and Implementing Programs for Cancer Prevention and Control

Introduction Letter

Dear Hoosiers,

The *Indiana Cancer Facts and Figures 2015* is the fourth iteration of our state's only comprehensive report on the burden of cancer. This report provides the most recent and accurate data available for the state of Indiana, covering a wide variety of current cancer issues and trends, including cancer incidence, mortality, and survival statistics as well as information on decreasing the risk of cancer, cancer symptoms, risk factors, early detection, and treatment.

The Indiana Cancer Consortium (ICC) is proud to promote the message that this report sends from the Indiana cancer community to Hoosiers across the state. The *Indiana Cancer Facts and Figures 2015* perfectly demonstrates the willingness and the passion that Hoosiers have to work together to improve and overcome our state's cancer burden. We know that we can only make a real difference through collective effort and action.

The size and scope of this report becomes that much more admirable when considering that nearly 100 percent of it is completed voluntarily by ICC members. As such, we trust that the collaborative efforts of our contributing partners will benefit all Indiana residents and serve as a rallying call for us to move forward as a single cancer control alliance.

From the ICC, we thank the American Cancer Society and the Indiana State Department of Health for their organizational partnership in the development of this report. We also thank all those who helped make this report a reality. The time, the resources, and the expertise shared will establish this report as a leading tool for Indiana's cancer prevention and control efforts. Furthermore, we also recognize the value of all those who will now take this report and act according to its findings.

Finally, to all Indiana residents, the ICC promises to continue convening partners, identifying cancer burdens, and developing and implementing evidence-based interventions that will improve the health of all citizens of Indiana.

Sincerely,

Sara Edgerton
Co-Chair
Indiana Cancer Consortium

Steve Tharp, M.D.
Co-Chair
Indiana Cancer Consortium

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Collaborating to Conquer Cancer

The Comprehensive Cancer Control National Partnership is a movement of states, tribes, territories, US Pacific Island Jurisdictions, and local communities working together to reduce the burden of cancer for all people. In the Hoosier state, the Indiana Cancer Consortium (ICC) serves as that comprehensive cancer control coalition, responsible for developing, implementing, and evaluating a statewide cancer control plan, which address cancer from prevention through palliation.

Collaborating to Conquer Cancer is the underlying philosophy, vision, and model that directs the ICC, as well as our partners across the nation. In Indiana, we are proud to say that *Collaborating to Conquer Cancer* represents the more than 200 organizational and individual members of the ICC who work to bring together Indiana's cancer community, identify disease challenges facing both state and local communities, and develop evidence-based solutions that make a difference.

The ICC membership plans, contributes, and takes advantage of a full range of free services — including professional trainings, educational publications, mini-grants, and guidance. By listening to our partners, public health and medical experts, and other interested Hoosiers, we continually evolve to better address the gaps in cancer prevention and control across the state. The larger our coalition grows, the bigger impact we have. Become a member at IndianaCancer.org.

The Plan

The collaborative process is best reflected through the development and implementation of Indiana's current cancer control plan, our roadmap to coordinate cancer control efforts. The plan is comprised of six focus areas, including primary prevention, early detection, treatment, quality of life, data, and advocacy. Within those six areas, experts in the fields of public health, cancer research, and treatment identified the most important activities that, when implemented, can reduce cancer in Indiana. Day by day, as more partners engage in strategies from this plan, extraordinary accomplishments are made. *This* is the power of our unique cancer control alliance. Together we are stronger than cancer.

Key Activities

- Lead in the ongoing development, implementation, and evaluation of an Indiana-focused comprehensive cancer control plan that addresses cancer across the continuum.
- Provide guidance to members on current issues in cancer advocacy, research, detection, and treatment.
- Provide a forum for a multi-sectored and diverse membership to discuss the cancer issues challenging Indiana.
- Strengthen communication, resource sharing, and collaboration in the cancer community, and reduce duplication and inefficiency.
- Educate Indiana health workers and cancer advocates on current evidence-based strategies and best practices.
- Support and inform Indiana on policy, system, and environmental changes that decrease risk factors which impact Hoosier communities.

Indiana Cancer Facts and Figures 2015

The *Indiana Cancer Facts and Figures 2015* includes the most up-to-date cancer information available and identifies current cancer trends and their potential impact on Indiana residents. This report significantly helps the ICC measure Indiana's progress toward meeting the goals and objectives outlined in the *Indiana Cancer Control Plan*. This publication is an exemplary application of collaboration in public health. We hope that the sharing of knowledge, resources, and expertise among the many participating organizations to produce this tool will inspire organizations across the state to tackle the cancer burden together.

Understanding Cancer Data

Cancer data can sometimes be difficult to interpret. Here is some information about common terms and methods used to better understand cancer data so that it can be effectively used to guide interventions and policy decisions.

Incidence (New cases)

Incidence refers to annual or average annual incidence. Annual incidence is the number of new cases of cancer diagnosed during a calendar year. Average annual incidence is the number of new cases diagnosed during a specified number of years. Indiana resident incidence data in this report, unless otherwise noted, were obtained from the Indiana State Cancer Registry (ISCR). Because there are delays in health care providers reporting cancer cases to the ISCR and the ISCR has to make sure data are complete and accurate before publishing them, the most current data available for this report were from 2012. Visit www.in.gov/isdh/24360.htm to see if more up-to-date data are available.

Mortality (Deaths)

Mortality refers to annual or average annual mortality. Annual mortality is the number of deaths from cancer during a calendar year (Note: the cancer was not necessarily diagnosed in the same year). Average annual mortality is the average number of deaths during a specified number of years. Mortality data reflect the underlying cause of death as recorded on the death certificate. Indiana resident mortality data in this report, unless otherwise noted, are from the ISCR who obtains annual death certificate record information from the Indiana State Department of Health Vital Records Department. Data from 2012 were the most current mortality data available for this report. Visit www.in.gov/isdh/24360.htm to see if more up-to-date data are available.

Cancer Rates

In this document, cancer rates represent the number of new cases of cancer per 100,000 people (incidence) or the number of cancer deaths per 100,000 people (mortality) during a specific period [see example below]. Typically, incidence rates are calculated based only on the number of invasive cancer cases that occurred during a period and do not include in situ cases. Invasive cancer is cancer that has spread beyond the layer of tissue in which it developed and is growing into surrounding, healthy tissues. See page 9 for additional information about in situ cancer.

Example: If a county's lung cancer incidence rate is 40.0 cases per 100,000 people that means 40 new cases of invasive 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 invasive lung cancer were diagnosed in that county during that year. 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). Population data to calculate the incidence rates were obtained from www.seer.cancer.gov/popdata.

Age-Adjusted Rates

Older age groups generally have higher cancer rates than younger age groups. For example, in Indiana, more than 60 percent of new lung cancer cases occur in those ages 60 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 report, unless otherwise noted, have been age-adjusted. This removes the impact of different age distributions between populations and allows for direct comparisons of those populations. Additionally, age-adjustment 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 were age-adjusted using the direct method. This method weights the age-specific rates (*i.e.*, rates calculated for each age group) for a given sex, race, or geographic area by the age distribution of the standard population. The 2000 US standard million population and five-year age group population numbers were used to calculate all of the age-adjusted rates in this report.

Confidence Intervals and Statistical Significance

Because the ISCR collects information on all reportable cancer cases that occur in Indiana, the incidence and mortality rates in this report are not subject to sampling error (*i.e.*, error in estimating rates because one is working with sample rather than population data). However, cancer rates are often impacted by random variation, especially when looking at rates for rare types of cancer or among small geographic areas. Because of this random variation, confidence intervals (CIs) are used to describe the range of that variation. Most typically, 95% CIs are calculated, which provide a range of values in which one is 95% confident that the true rate exists, or, more technically, a 95% CI is such that if one repeated a study 100 times, 95 of the intervals would include the true rate.

For this report, CIs for the age-adjusted rates were calculated with a method based on the gamma distribution.[1] This method produces valid CIs even when the number of cases is very small. When the number of cases is large, the CIs produced with the gamma method are equivalent to those produced with the more traditional methods. The formulas for computing CIs can be found at www.in.gov/isdh/24360.htm

(click "Help" then "Index"). Generally, when the 95% CI for the area of interest does not overlap with the 95% CI for the comparison area, we would say that the two areas are statistically significantly different at the $P<.05$ level (*i.e.*, the difference between the two rates is more than that expected by random variation). The limitation of this method, though, is that if two rates have overlapping CIs, they are probably not significantly different, but there is a chance that they still could be. Therefore, some of the rates in this report (*e.g.*, county rates) not designated as being significantly above or below the comparison rate (*e.g.*, Indiana rate) could still be significantly different.

Other Common Terms Used and Groups Referenced in this Report:

Adults. Used in this report to refer to people ages 18 years and older.

Age-specific Rate. The total number of new cases or deaths among residents in a specific age group divided by the population of that age group then multiplied by 100,000.

American Cancer Society (ACS). A nationwide, community-based voluntary health organization dedicated to eliminating cancer as a major health problem by preventing cancer, saving lives, and diminishing suffering from cancer, through research, education, advocacy, and service. Additional information is available at www.cancer.org.

Burden. The number of new cases or deaths from cancer or overall impact of cancer in a community.

Carcinogen. Any chemical, physical, or viral agent that is known to cause cancer.

Centers for Disease Control and Prevention (CDC). The CDC's mission is the following: "Collaborating to create the expertise, information, and tools that people and communities need to protect their health — through health promotion, prevention of disease, injury and disability, and preparedness for new health threats." Additional information is available at www.cdc.gov.

Five-year Survival. The percentage of people who are alive five years after their cancer is diagnosed. While statistically valid, these percentages are based on historical data and might 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. Cancer that has spread beyond the location in which it started.

Metastasis. Movement of cancer from part of the body to a separate area of the body.

Morbidity. The number of people who have a disease.

National Center for Health Statistics (NCHS). Contained within the CDC, the NCHS is the nation's principal health statistics agency. They compile statistical information to guide actions and policies to improve health. Additional information is available at www.cdc.gov/nchs.

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

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

Surveillance, Epidemiology, and End Results (SEER) Program. Contained within the National Cancer Institute, SEER works to provide information on cancer statistics in an effort to reduce the burden of cancer among the US population. Additional information is available at www.seer.cancer.gov.

Staging. The process of finding out whether cancer has spread and, if so, how far. There is more than one system for staging (see page 9 for additional information).

References are provided throughout this report to provide readers with additional information. Web addresses are provided for online information.

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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 might form new tumors (metastases). If this growth is not controlled, cancer might 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?

All cancers develop because of damage to or mutation of genes that control cell growth and division. These genetic changes can be caused by exposure to external factors (*e.g.*, tobacco, poor diet, alcohol, chemicals, sunlight, radiation, infectious organisms) or internal factors (*e.g.*, inherited mutations, hormones, immune conditions, mutations that occur from metabolism). Only about five to ten percent of all cancers are the result of inherited gene mutations.[1]

External and internal factors often act together or in sequence to initiate or promote cancer development. Many years often pass between exposures or mutations and detectable cancer. Because of this, it is often difficult to directly identify causes of specific cancer cases.

Who gets cancer?

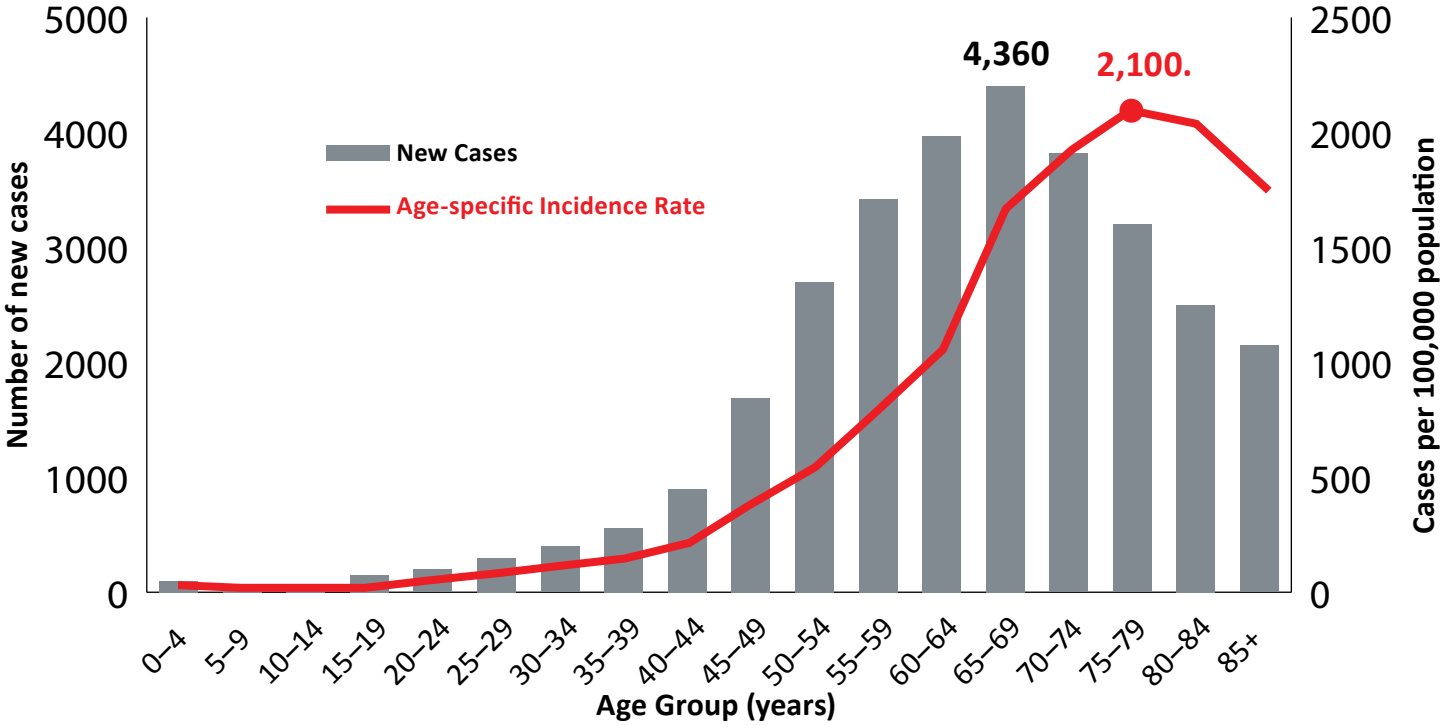
Anyone can get cancer at any age; however, middle and older aged people are most likely to develop cancer. In Indiana, during 2012, 66 percent of all cancers cases occurred among people ages 55–84, including 23 percent among people ages 55–64, 26 percent among people ages 65–74, and 18 percent among people ages 75–84 [Figure 1].

Additionally, individuals who have been exposed to certain external and internal risk factors have an increased risk of developing cancer. For example, male smokers are about 23 times more likely to develop lung cancer than nonsmokers.[2] Also, females who have a first degree relative (*i.e.*, mother, sister, or daughter) with a history of breast cancer have about twice the risk of developing breast cancer, compared to females who do not have this family history.[2]

Can cancer be prevented?

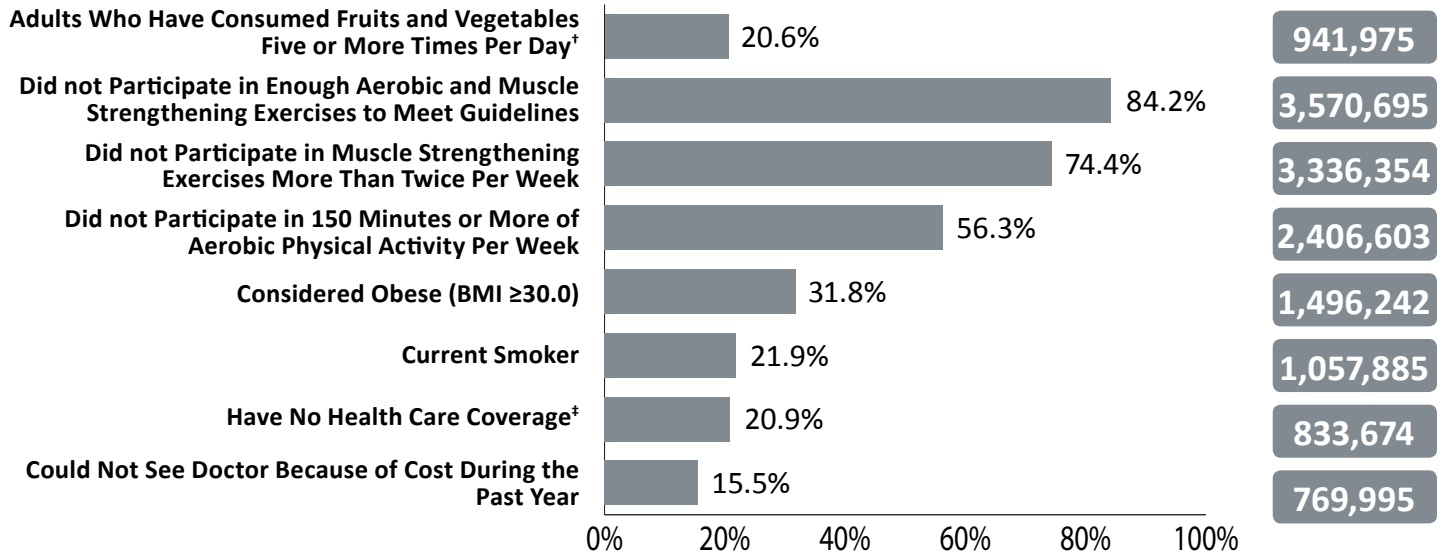
Many cancers can be prevented by modifying external risk factors and making lifestyle changes, such as eliminating tobacco use, improving dietary habits, increasing physical

Figure 1. Number and Rate of New Cancer Diagnoses among Residents — Indiana, 2012



Data are provided for the age groups with the largest number of cases and highest rate. Source: Indiana State Cancer Registry

Figure 2. Preventive Cancer Behaviors and Access to Medical Care among Adults* — Indiana, 2013



** Adults are people ages 18 years and older*

† Data from 2009

‡ Adults ages 18–64

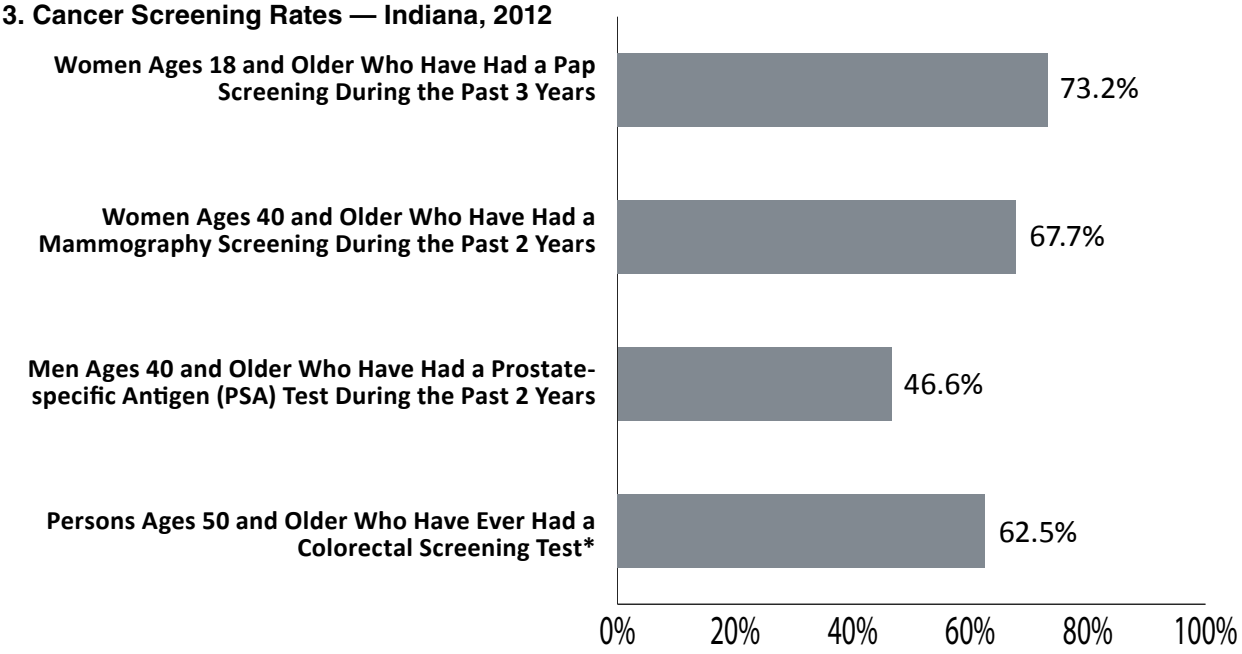
Source: Indiana Behavioral Risk Factor Surveillance System

activity, losing weight, and avoiding excessive sun and infectious disease exposures. Additionally, many cancers can be prevented or identified at an early stage if people receive regular medical care and obtain early detection cancer screenings. Figure 2 describes the burden of some lifestyle and external factors among Indiana adults and Figure 3 describes cancer screening rates among Indiana adults.

Additional information about cancer risk factors include:

- **Tobacco.** All cancers caused by the use of tobacco products could be prevented. The American Cancer Society (ACS) estimates that, during 2014, almost 176,000 cancer deaths were caused by tobacco use.[2] During 2013, 21.9 percent of Indiana adults were current smokers.[3]
- **Body Weight, Diet, and Physical Activity.** The World Cancer Research Fund estimates that about one-third of the 585,720 cancer deaths expected to have occurred during 2014 were related to overweight or obesity, physical inactivity, and poor nutrition.[2] During 2013, 31.8 percent of Indiana adults were considered obese.[3] Additionally, during 2013, 56.3 percent of Indiana adults did not get the recommended 150 minutes of exercise per week (recommendations available at www.cdc.gov/physicalactivity/everyone/guidelines/index.html).[3] During 2009, approximately 80 percent failed to eat fruits and vegetables five or more times each day.[3] Diets low in animal fat and high in fruits and vegetables could help prevent certain cancers.
- **Infection with HPV and Other Infectious Diseases.** The human papillomavirus (HPV) is the single greatest risk factor for cervical cancer.[4] The Centers for Disease Control and Prevention (CDC) estimates that 21,000 cancer cases each year could potentially be prevented with HPV vaccines. In all, an estimated 15 to 20 percent of cancers worldwide are related to infectious exposures, such as hepatitis B virus (HBV), human papillomavirus (HPV), human immunodeficiency virus (HIV), *Helicobacter* bacteria, and others.[5] Many of these infections can be prevented through behavioral changes or the use of vaccines or antibiotics.[5]
- **Sun Exposure.** Excessive exposure to ultraviolet (UV) radiation from the sun or other sources, like tanning beds, is the greatest risk factor for developing skin cancer. The US Department of Health and Human Services and the International Agency of Research on Cancer panel has found that exposure to sunlamps or sun beds is a known carcinogen.[6]
- **Health Care Coverage**. Uninsured and underinsured patients are substantially more likely to be diagnosed with cancer at a later stage, when treatment can be more extensive and costly.[2] According to the US Census Bureau, almost 48.6 million Americans were uninsured in 2011 — including one-third of Hispanics and one in 10 children (18 years and younger).[2] In 2013, approximately 21 percent (20.9) of Indiana residents ages 18-64 reported to having no health care coverage.[3] The Affordable Care Act is expected to continue to reduce the number of uninsured people — improving the health care system for cancer patients.[2]
- **Screening.** 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 include breast, cervix, colon, lung, oral cavity, rectum, skin, and testicular cancers.

Figure 3. Cancer Screening Rates — Indiana, 2012



** Sigmoidoscopy or colonoscopy*

Source: Indiana Behavioral Risk Factor Surveillance System

How is cancer staged?

A cancer's stage is based on the primary tumor's size and location in the body and whether it has spread from the site of origin to other areas of the body. There are two main staging systems 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 is assigned. Stages are given numbers (I, II, III, IV) and represent a scale — stage I is the earliest possible diagnosis, and stage IV is advanced.

Summary staging is useful for descriptive and statistical analyses of cancer data and is used throughout this report. An in situ tumor is a tumor at the earliest possible stage — when cells have not invaded surrounding tissue. This stage can only be diagnosed by microscopic examination. A localized tumor is any tumor that has not spread beyond the primary organ. A regional or distant tumor is one that has spread to other parts of the body (this is also referred to as a tumor that has metastasized), either through the blood or lymph systems. With an unstaged/unknown tumor, there is insufficient information available to determine the stage of the disease.

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 4].

How is cancer treated?

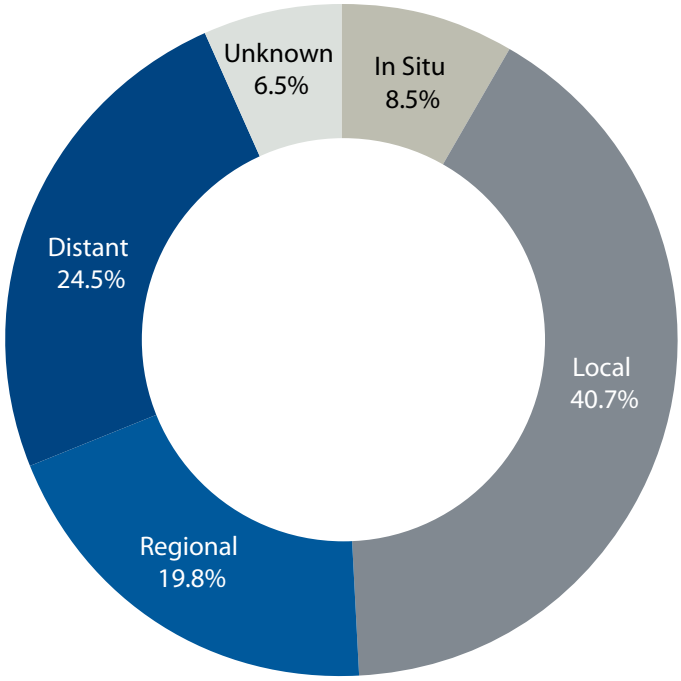
Treatment depends on the cancer type and stage, specific diagnosis, and overall health of the individual. Cancer is treated by one or more of the following therapies:

- **Surgery** removes the tumor by cutting out 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 cancers in early stages.
- **Hormone therapy** might be given to block the body's natural hormones and to slow or stop the growth of certain cancers.
- **Immunotherapy or biologic therapies are** used to stimulate and strengthen a person'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 done 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 five 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, such as a basal cell carcinoma, are considered cured as soon as the lesion is removed. For other cancers (*e.g.*, pancreatic), eight to ten years must pass before the person is considered cured.

Figure 4. Percent of Cancer Cases Diagnosed During Each Stage* — Indiana, 2008–2012



During 2008–2012, of the 169,378 Indiana residents who received an in situ or invasive cancer diagnosis, 83,269 (49.2%) were diagnosed in the in situ or local stage, 75,026 (44.3%) were diagnosed in the regional or distant stage, and 11,083 (6.5%) had unknown staging.

** Includes all in situ and invasive cancers except for basal and squamous cell skin cancers and in situ bladder, cervical, and prostate cancers, which are not reportable.*

Source: Indiana State Cancer Registry

What are the most common cancers?

The most commonly occurring cancers for both the state and the nation are the same. Excluding skin cancers, breast and prostate are the most prevalent cancers among females and males, respectively. Lung, including bronchus, and colon cancers are the next most common cancers among both sexes [Table 1]. Annually, lung cancer is responsible for the most cancer-related deaths among both sexes [Table 1].

How many people alive today will get cancer?

About 2.4 million Hoosiers, or 2 in 5 people now living in Indiana, will eventually develop cancer. Nationally, men have slightly less than a one in two chance of developing cancer in their lifetime; for women, the lifetime risk of developing cancer is a little more than one in three.[2]

How many people alive today have ever had cancer?

Approximately 13.7 million Americans with a history of cancer were alive on January 1, 2012.[2] Some of these individuals were cancer free, while others still had evidence of cancer and might have been undergoing treatment.

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

The ACS estimated that approximately 35,620 Indiana residents will be diagnosed with cancer in 2015, amounting to almost four new cases of cancer diagnosed every hour of every day. Nationally, an estimated 1.6 million new cancer cases were diagnosed in 2014.[2] These estimates did not include cases of non-melanoma skin cancer and carcinoma in situ (except for in situ urinary bladder cancer cases).

How many people are expected to die from cancer this year?

During 2015, about 13,420 Indiana residents are expected to die of cancer, which translates to approximately 36 people every day.[2] Cancer is the second leading cause of death in Indiana following heart disease. Among children ages five to 14, cancer is the second leading cause of death following deaths from accidents.

How many people today survive cancer?

Using data from the Surveillance Epidemiology and End Results (SEER) registry, the five-year survival rate for

Table 1. Leading Sites of New Cancer Cases and Deaths among Indiana Residents by Sex, 2012

Number (%) of New Cases

Males	Count	%	Females	Count	%
Prostate	2,844	19.25%	Breast	4,366	27.83%
Lung and Bronchus	2,540	17.20%	Lung and Bronchus	2,134	13.60%
Colon and Rectum	1,447	9.80%	Colon and Rectum	1,378	8.78%
Urinary Bladder	1,071	7.25%	Corpus and Uterus, NOS	994	6.34%
Kidney and Renal Pelvis	688	4.66%	Brain and Other Nervous System	615	3.92%
Non-Hodgkin Lymphoma	657	4.45%	Thyroid	588	3.75%
Melanoma of the Skin	589	3.99%	Non-Hodgkin Lymphoma	545	3.47%
Oral Cavity and Pharynx	567	3.84%	Melanoma	502	3.20%
Brain and Other Nervous System	444	3.01%	Kidney and Renal Pelvis	429	2.73%
Pancreas	430	2.91%	Pancreas	420	2.68%
All Sites	**14,771**		**All Sites**	**15,689**	

Number (%) of Deaths

Males	Count	%	Females	Count	%
Lung and Bronchus	2,250	31.89%	Lung and Bronchus	1,708	27.29%
Colon and Rectum	613	8.69%	Breast	872	13.93%
Prostate	606	8.59%	Colon and Rectum	556	8.88%
Pancreas	395	5.60%	Pancreas	388	6.20%
Leukemia	308	4.37%	Leukemia	238	3.80%
Liver and Intrahepatic Bile Duct	294	4.17%	Non-Hodgkin Lymphoma	203	3.24%
Esophagus	280	3.97%	Corpus and Uterus, NOS	200	3.20%
Urinary Bladder	255	3.61%	Brain and Other Nervous System	161	2.57%
Non-Hodgkin Lymphoma	239	3.39%	Liver and Intrahepatic Bile Duct	156	2.49%
Kidney and Renal Pelvis	212	3.00%	Kidney and Renal Pelvis	118	1.89%
All Sites	**7,055**		**All Sites**	**6,258**	

Source: Indiana State Cancer Registry

Table 2. Cancer Incidence and Mortality (Death) Rate Comparisons between Indiana and the US, by Sex and Race, 2006–2010*

	Incidence rate per 100,000 people (2006–2010)			Mortality rate per 100,000 people (2006–2010)		
	Indiana	US	Difference (%)	Indiana	US	Difference (%)
Total	464.0†	469.1	-1.73	192.6†	176.4	9.18
Males	527.4†	541.1	-2.53	223.8†	215.3	3.95
Females	422.0†	417.8	1.01	161.5†	149.7	7.88
Whites	458.9†	469.3	-2.22	191.4†	175.8	8.87
African Americans	472.8	476.5	-0.78	221.4†	210.3	5.28

** Age-adjusted*

† Indiana rate is significantly higher (P<.05) than the US rate

Source: United States Cancer Statistics: 1999 — 2010 Mortality, WONDER Online Database. United States Department of Health and Human Services, Centers for Disease Control and Prevention; 2013. Accessed at http://wonder.cdc.gov/CancerMort-v2010.html on Mar 28, 2014 3:20:11 PM

2004–2010 from the 18 SEER geographic areas was 66.1 percent.[7] Factors such as early stage of disease at diagnosis can greatly improve the probability of survival after five years.

What are the costs of cancer?

During 2014, $1.83 billion was the estimated direct cost of treating Indiana residents with cancer. The estimated indirect costs totaled $11.12 billion for the same year.[8] The Milken Institute estimated that, should current trends continue, Indiana residents would spend $2.76 billion on direct costs for cancer care in 2023.[9]

How does cancer incidence and mortality in Indiana compare with the rest of the US?

Indiana's age-adjusted cancer incidence rate during 2006–2010 was 464.0 per 100,000 people. This was statistically higher than, but very similar to, the national rate of 469.1 per 100,000 people (<2% difference) [Table 2; Figure 5].

However, during the same period, Indiana's age-adjusted mortality rate was nine percent higher than the national rate (192.6 versus 176.4 deaths per 100,000 people). This included being almost four percent higher among Indiana males (223.8 versus 215.3 deaths per 100,000 males) and almost eight percent higher among Indiana females (161.5 versus 149.7 deaths per 100,000 females) [Table 2; Figure 6].

Lung cancer had the largest differences between the Indiana and US incidence and mortality rates, as the incidence rate among Indiana residents was almost 15 percent higher and the mortality rate was over 18 percent higher. This increase in risk is mostly attributable to Indiana having a high prevalence of smokers compared to the rest of the US. In 2013, Indiana had the 12th highest adult smoking rate in the country.[3]

Is the cancer burden in the US and Indiana lessening?

The burden of specific cancer types among US residents has changed over the years [Figures 7 and 8]. For example, with the gradual decrease in smoking rates among Americans over the past several decades, lung cancer mortality rates have begun to decrease, especially among US males.

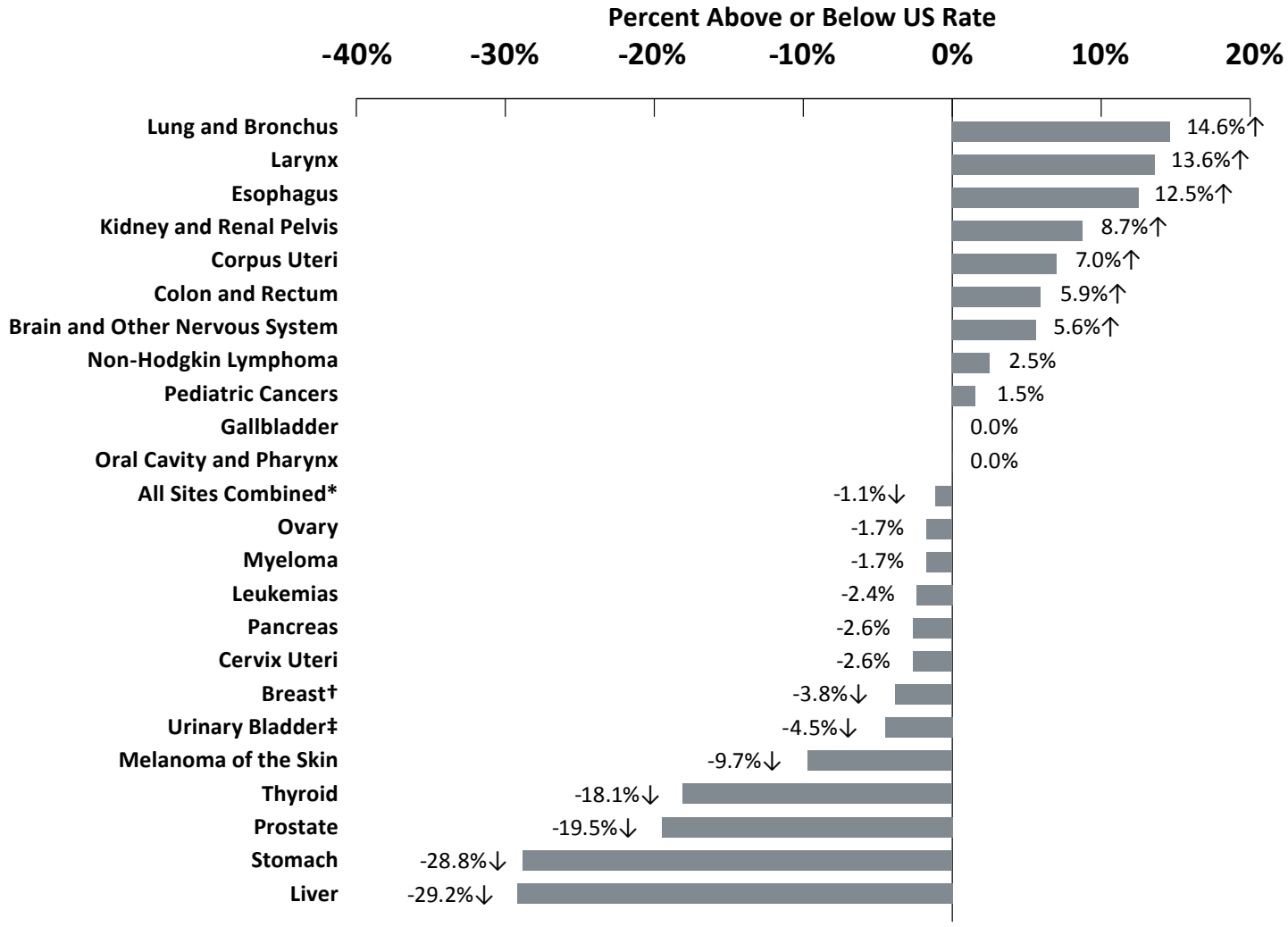
In Indiana, from 2003 to 2012, the age-adjusted incidence rates for all cancers combined decreased 13 percent from 490.2 to 428.0 cases per 100,000 people. Likewise, the age-adjusted mortality rates decreased 9.4 percent from 206.0 to 186.7 deaths per 100,000 people. However, trends varied among the different cancer types.

These statistics indicate that progress continues to be made in the early detection and treatment of certain cancers, and that the incidence and mortality of some cancers is declining. However, a significant cancer burden still exists among Indiana residents that require continued and more targeted cancer control efforts.

How does Indiana track changes in cancer risk and risk behavior data?

The Indiana State Cancer Registry was established in 1987 to compile information on 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 allows for the evaluation of cancer prevention

Figure 5. How Do Indiana Cancer Incidence Rates Compare to US Rates?* (2006–2010)



** Age-adjusted*

† Female breast cancers only

‡ Urinary Bladder includes invasive and in situ.

Note: ↑↓ symbols denote whether Indiana's rate is significantly different than the US rate based on the 95% confidence interval overlap method (see Page 4 for description). ↑ = significantly higher; ↓ = significantly lower.

Source: United States Cancer Statistics: 1999–2010 Incidence, WONDER Online Database. United States Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute; 2013. Accessed at http://wonder.cdc.gov/cancer-v2010.html on Jul 14, 2014 3:56:43 PM

efforts and the measurement of progress toward reaching the state goal of reducing cancer incidence and mortality among Indiana residents.

Additionally, several data sources are used to describe the burden of risk factors (*e.g.*, obesity) and cancer screening rates among Indiana residents. The Behavioral Risk Factor Surveillance System (BRFSS) is the main source utilized to do this because it provides yearly data that can be used to generate Indiana-specific estimates for a large number of cancer risk and preventative factors. These findings can then be tracked over time and compared to other states to evaluate how Indiana is progressing in those areas. Additional local, state, and national data resources can be found in the Indiana Community Health Information Resource Guide (www.indianactsi.org/chep/resourceguide).

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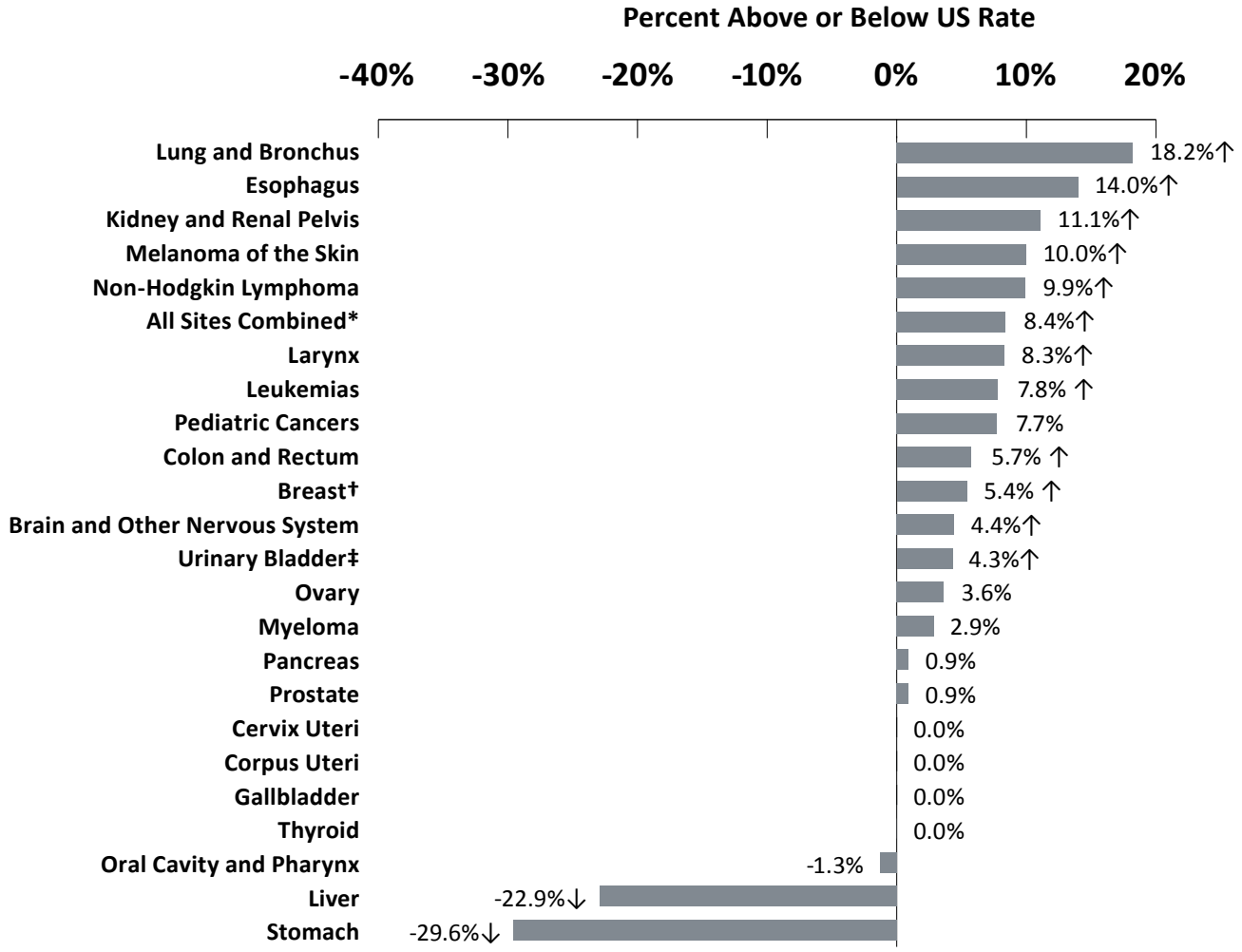
Figure 6. How Do Indiana Cancer Mortality (Death) Rates Compare to US Rates?* (2006–2010)



** Age-adjusted*

† Female breast cancers only

‡ Urinary Bladder includes invasive and in situ.

Note: ↑↓ symbols denote whether Indiana's rate is significantly different than the US rate based on the 95% confidence interval overlap method (see Page 4 for description). ↑ = significantly higher; ↓ = significantly lower.

Source: United States Cancer Statistics: 1999–2010 Incidence, WONDER Online Database. United States Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute; 2013. Accessed at http://wonder.cdc.gov/cancer-v2010.html on Jul 14, 2014 3:56:43 PM

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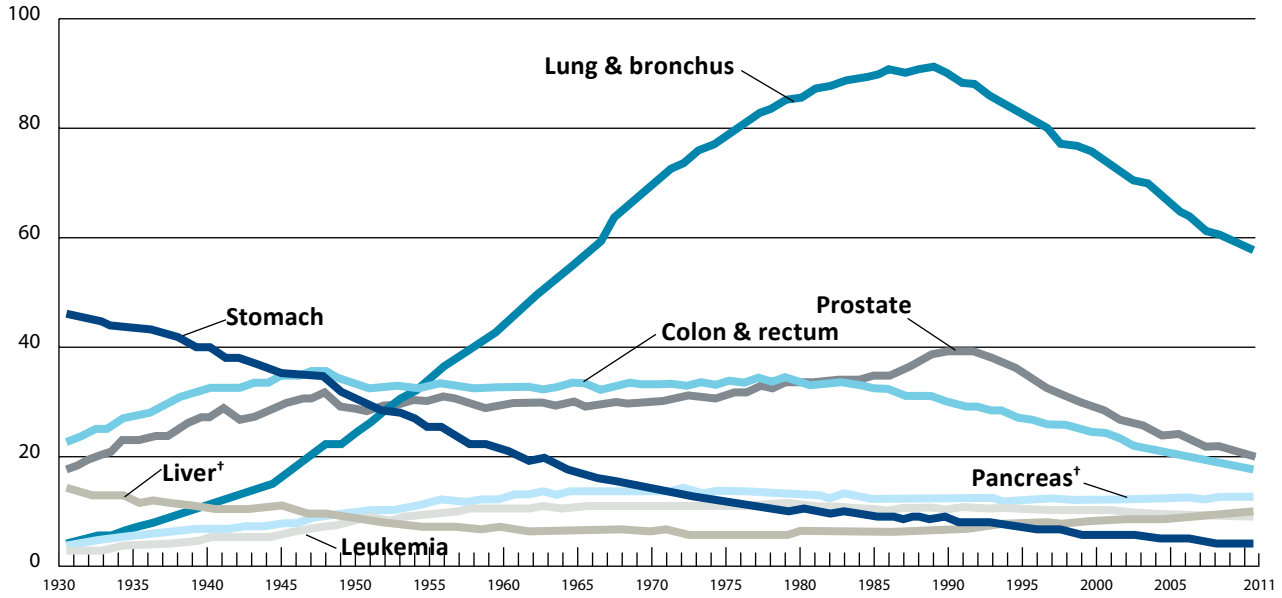
Figure 7. Cancer Mortality (Death) Rates among Males by Site* — US, 1930–2011



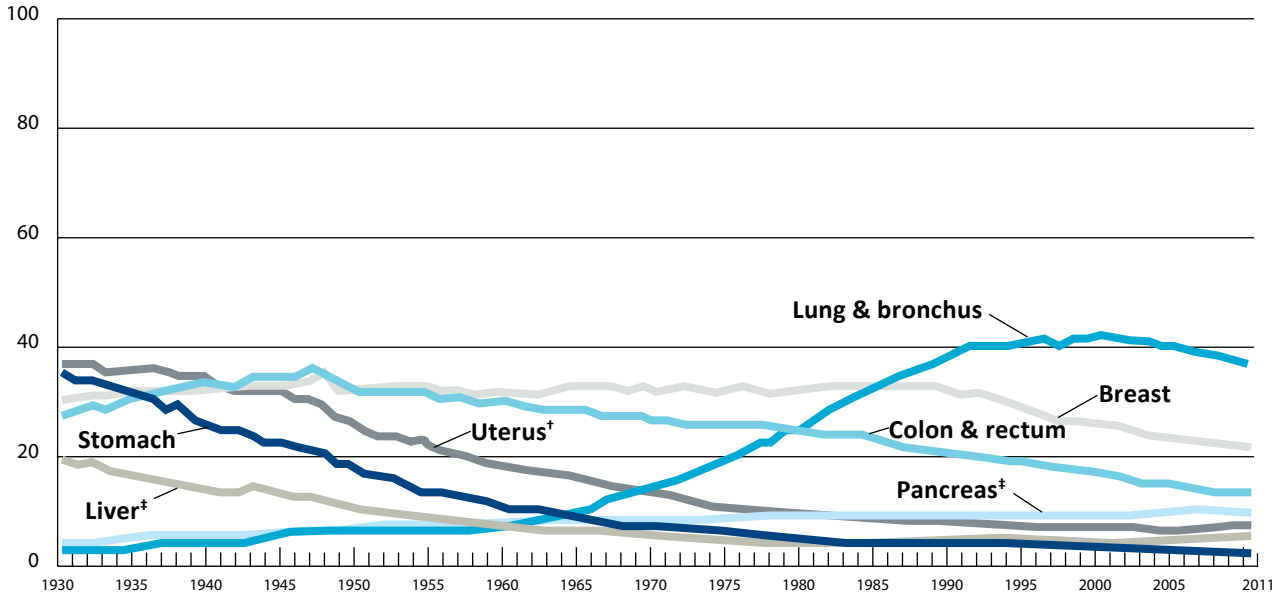
** Per 100,000 age adjusted to the 2000 US standard population.*

† Mortality rates for pancreatic and liver cancers are increasing.

Note: Due to changes in IDC coding, numerator information has changed over time. Rates for cancer of the liver, lung and bronchus, and colon and rectum are affected by these coding changes.

Source: US Mortality Volumes 1930 to 1959 and US Mortality Data 1960 to 2011, National Center for Health Statistics, Centers for Disease Control and Prevention. ©2015, American Cancer Society, Inc., Surveillance Research.

Figure 8. Cancer Mortality (Death) Rates among Females by Site* — US, 1930–2011



** Per 100,000 age adjusted to the 2000 US standard population.*

† Uterus refers to uterine cervix and uterine corpus combined.

‡ Mortality rates for pancreatic and liver cancers are increasing.

Note: Due to changes in IDC coding, numerator information has changed over time. Rates for cancer of the liver, lung and bronchus, and colon and rectum are affected by these coding changes.

Source: US Mortality Volumes 1930 to 1959 and US Mortality Data 1960 to 2011, National Center for Health Statistics, Centers for Disease Control and Prevention. ©2015, American Cancer Society, Inc., Surveillance Research.

Table 3. Indiana Cancer Incidence Rates by County*, 2008–2012

County	All Cancers		Prostate (Male-only disease)		Female Breast		Lung		Colon and Rectum	
	Count	Rate	Count	Rate	Count	Rate	Count	Rate	Count	Rate
Indiana	163,104	466.6	17,643	106.9	22,073	118.1	25,837	73.9	15,483	44.4
Adams	821	440.7	98	115.0	112	113.6	92	48.5	102	55.7 ↑
Allen	8,121	447.7 ↓	865	101.6	1,142	116.2	1,117	62.5 ↓	780	42.8
Bartholomew	2,028	467.7	180	87.9 ↓	283	122.3	331	76.0 ↓	178	41.1
Benton	226	424.8	X	X	X	X	46	83.0	26	51.8
Blackford	427	493.9	53	129.2	54	116.0	69	78.9	44	48.7
Boone	1,246	428.0 ↓	134	95.9	213	133.8	176	63.7	110	38.1
Brown	470	448.9	57	96.4	57	96.1	66	63.3	44	44.0
Carroll	530	431.2	71	107.9	65	96.6	78	61.9	52	42.0
Cass	970	422.1 ↓	119	112.7	121	102.1	192	82.9	98	42.1
Clark	2,825	468.3	198	66.2 ↓	376	110.9 ↑	512	86.1 ↑	261	43.5
Clay	807	505.9 ↑	94	119.1	93	110.6	118	69.7	91	57.7 ↑
Clinton	854	454.7	94	104.4	108	112.4	150	80.9	98	49.6
Crawford	309	479.5	29	80.4	45	138.1	56	83.7	25	37.7
Daviess	774	438.9	82	98.5	84	89.4 ↓	120	67.2	88	48.3
Dearborn	1,237	439.1	152	107.7	167	113.2	216	76.0	125	46.0
Decatur	660	443.8	81	114.8	68	84.8 ↓	108	72.0	57	37.8
DeKalb	1,044	458.9	109	97.7	151	124.1	167	72.1	104	46.8
Delaware	3,228	492.6 ↑	394	128.5 ↑	406	118.2	553	82.9 ↑	312	46.0
Dubois	1,092	445.0	132	114.1	144	110.9	138	55.5 ↓	111	44.7
Elkhart	4,695	468.3	506	110.5	600	113.2	700	69.8	420	42.1
Fayette	669	426.8 ↑	73	95.4	63	78.3	138	84.7	61	37.7
Floyd	1,992	481.4	162	81.4 ↓	282	122.3	338	82.2	166	39.2
Fountain	521	459.0	64	114.4	71	122.8	92	76.9	60	51.3
Franklin	523	386.3 ↓	71	115.6	62	92.4	84	60.1	41	30.2 ↓
Fulton	625	473.3	69	104.9	76	110.3	110	81.2	72	54.0
Gibson	908	450.3	111	116.6	133	125.3	141	68.2	109	53.7
Grant	2,265	519.5 ↑	284	139.1 ↑	287	124.8	357	78.9	235	53.6 ↑
Greene	949	463.6	87	85.3	110	101.6	172	79.6	90	43.9
Hamilton	4,895	412.3 ↓	548	93.1 ↓	888	129.6 ↑	484	47.2 ↓	414	36.2 ↓
Hancock	1,827	480.6	142	74.5 ↓	242	118.7	312	82.8	153	40.2
Harrison	1036	457.9	85	71.9 ↓	140	118.1	186	82.0	77	33.8 ↓
Hendricks	3,398	485.0	361	105.1	500	129.2	482	72.0	269	38.6
Henry	1,479	475.9	159	107.5	172	102.3	250	79.3	166	52.1
Howard	2,263	437.0 ↓	219	86.3 ↓	291	106.5	398	75.3	205	39.0
Huntington	1,038	475.5	110	106.1	129	111.1	136	62.3	102	46.3
Jackson	1,232	504.9 ↑	121	105.9	170	134.8	200	78.5	116	48.5
Jasper	913	488.1	109	116.7	122	126.3	166	88.1 ↑	88	46.6
Jay	628	496.1	67	110.7	98	140.2	91	71.0	77	60.6 ↑
Jefferson	873	459.7	89	94.5	91	89.4 ↓	145	75.3	80	42.6
Jennings	757	499.5	63	84.8	94	115.3	148	97.3 ↑	50	35.5
Johnson	3,279	453.8	267	75.5 ↓	446	114.5	522	73.2	329	45.4
Knox	1,182	510.4 ↑	142	131.9 ↑	154	123.8	171	71.4	121	53.0
Kosciusko	1,953	460.3	227	112.1	261	119.5	302	69.8 ↓	188	44.1
LaGrange	703	401.2 ↓	66	78.3 ↓	93	104.2	110	62.2	63	35.1
Lake	13,516	494.8 ↑	1,714	136.4 ↑	1,840	124.7	1,978	72.2	1,435	52.5 ↑
LaPorte	3,179	486.9 ↑	432	140.0 ↑	398	115.9	508	77.1	308	47.7
Lawrence	1,385	470.7	135	90.3	171	111.0	250	82.7	149	50.6

County	All Cancers		Prostate (Male-only disease)		Female Breast		Lung		Colon and Rectum	
	Count	Rate	Count	Rate	Count	Rate	Count	Rate	Count	Rate
Madison	3,779	476.6	505	133.9 ↑	468	112.7	636	79.0	350	44.1
Marion	19,952	462.5	1,802	91.7 ↓	2,926	122.2	3,357	80.1 ↑	1,715	40.1 ↓
Marshall	1,281	470.8	167	131.4	163	111.8	167	60.0 ↓	121	44.7
Martin	344	541.9 ↑	40	120.7	48	148.9	49	75.3	47	73.4 ↑
Miami	913	428.1 ↓	103	95.1	103	98.4	167	78.4	66	32.1 ↓
Monroe	2,644	450.7	257	93.3	368	116.1	374	63.8 ↓	235	41.2
Montgomery	955	419.1 ↓	93	86.3	109	91.4 ↓	176	77.1	92	40.1
Morgan	1,952	503.2 ↑	213	109.4	275	131.7	307	80.2	201	52.5 ↑
Newton	388	432.2	46	100.8	46	101.0	66	70.4	41	46.9
Noble	1,056	417.3 ↓	107	91.0	152	113.9	161	64.9	103	40.5
Ohio	206	542.2	X	X	29	147.0	43	109.0 ↑	24	66.5
Orange	608	493.9	48	75.0 ↓	74	110.9	119	93.8 ↑	69	57.3
Owen	677	515.3 ↓	73	95.7	72	106.4	120	92.0 ↑	68	54.7
Parke	474	441.2	56	99.2	57	99.5	96	86.0	39	35.8
Perry	527	443.2	46	81.4	72	111.3	106	90.7	49	40.4
Pike	363	425.1	38	91.8	53	120.5	56	62.1	43	49.6
Porter	4,315	486.7 ↑	618	141.5 ↑	606	126.6	663	76.0	393	46.2
Posey	735	468.9	99	129.7	101	120.1	94	62.2	69	44.4
Pulaski	390	452.5	49	110.7	41	93.2	63	69.6	45	52.3
Putnam	998	473.8	82	80.0 ↓	121	114.6	200	94.0 ↑	100	47.7
Randolph	846	502.2	106	130.7	104	120.2	143	81.4	87	51.2
Ripley	768	462.9	78	97.7	100	113.6	133	78.2	73	43.3
Rush	527	500.7	45	86.1	61	115.3	87	78.1	46	42.8
Scott	647	479.5	31	47.2 ↓	77	108.1	124	89.5	71	51.3
Shelby	1,304	509.7 ↑	130	105.2	184	138.4	206	80.4	131	49.8
Spencer	573	448.5	63	100.5	78	120.5	100	75.7	63	50.4
St. Joseph	6,805	469.3	827	122.6 ↑	937	121.9	1,050	71.8	688	47.1
Starke	725	507.1 ↑	91	124.9	81	111.1	129	85.9	57	40.3
Steuben	840	411.9 ↓	91	87.3	99	93.0 ↓	139	65.5	76	37.7
Sullivan	583	454.0	55	92.0	70	105.7	101	75.6	64	50.0
Switzerland	285	472.3	27	85.2	22	72.4 ↓	51	84.4	38	66.5 ↑
Tippecanoe	3,355	477.7	356	113.2	469	125.3	472	68.5	293	42.9
Tipton	464	443.0	41	76.2	72	129.8	76	72.2	61	56.0
Union	207	457.3	31	150.5	20	86.9	34	67.7	X	X X
Vanderburgh	4,617	445.3 ↓	491	102.2	599	109.3	827	78.7	427	41.0
Vermillion	545	515.4 ↑	75	149.3 ↑	64	110.4	95	86.7	59	57.5
Vigo	2,971	506.2 ↑	312	117.9	409	131.3	477	81.0	270	45.2
Wabash	988	457.5	126	122.1	120	107.5	136	62.9	108	45.6
Warren	251	469.6	29	108.4	37	127.8	38	71.6	27	50.8
Warrick	1,611	476.2	201	115.3	252	137.7 ↓	215	64.4	143	42.7
Washington	815	518.8 ↑	60	76.8 ↓	112	137.5	158	97.8 ↑	74	48.6
Wayne	2,089	484.1	221	112.6	234	102.7	392	88.3 ↑	176	39.3
Wells	689	410.4 ↓	67	85.8	92	106.3	89	51.5 ↓	55	31.7 ↓
White	753	466.1	82	100.6	84	97.8	135	79.1	74	44.5
Whitley	913	470.2	106	114.7	120	119.8	132	67.2	83	42.5

** Rates are per 100,000 people and age-adjusted to the 2000 US Standard Population*

"x" Rate and comparison to state rate is suppressed if fewer than 20 cases occurred because rate is considered unstable.

Source: Indiana State Cancer Registry

Table 4. Indiana Cancer Mortality (Death) Rates by County*, 2008–2012

County	All Cancers		Prostate (Male-only disease)		Female Breast		Lung		Colon and Rectum	
	Count	Rate	Count	Rate	Count	Rate	Count	Rate	Count	Rate
Indiana	65,367	187.3	2,918	21.9	4,410	22.6	20,028	57.5	5,818	16.6
Adams	320	162.4 ↓	23	27.7	X	X	66	34.0 ↓	35	19.6
Allen	3,166	175.6 ↓	144	21.4	258	25.0	855	48.2 ↓	288	15.7
Bartholomew	804	185.2	33	19.4	53	21.6	257	58.7	63	15.1
Benton	98	178.3	X	X	X	X	44	82.2 ↑	X	X
Blackford	172	194.5	X	X	X	X	49	55.7	28	32.0 ↑
Boone	537	192.5	33	33.3 ↑	45	27.4	159	59.3	41	14.7
Brown	189	184.8	X	X	X	X	63	62.4	X	X
Carroll	229	181.0	X	X	X	X	54	41.8 ↓	22	17.5
Cass	450	192.0	X	X	28	22.8	162	69.3 ↑	34	14.9
Clark	1,158	195.4	36	17.8	50	15.1 ↓	414	70.5 ↑	102	17.0
Clay	311	189.9	X	X	22	24.6	96	58.2	36	22.1
Clinton	383	196.0	23	29.5	X	X	129	67.2	45	22.1
Crawford	110	171.1	X	X	X	X	43	63.7	X	X
Daviess	327	182.4	X	X	X	X	104	58.9	33	18.9
Dearborn	496	180.4	21	19.6	27	19.0	168	59.7	49	18.6
Decatur	301	199.5	X	X	X	X	96	64.1	20	13.5
DeKalb	439	193.4	X	X	25	20.5	122	53.4	41	17.4
Delaware	1,297	191.4	41	15.2 ↓	81	23.4	417	62.0	126	17.8
Dubois	434	173.7	23	24.7	32	22.6	97	39.0 ↓	49	19.4
Elkhart	1,720	171.3 ↓	81	21.4	112	19.9	492	49.7 ↓	155	15.8
Fayette	364	231.5 ↑	20	28.5	25	29.1	123	76.1 ↑	34	20.6
Floyd	761	186.2	21	13.1 ↓	56	23.0	252	60.7	51	12.2
Fountain	236	202.2	X	X	X	X	77	65.1	26	23.6
Franklin	255	186.4	X	X	X	X	79	57.1	29	21.4
Fulton	277	207.2	X	X	X	X	88	66.3	21	15.5
Gibson	357	174.3	X	X	28	25.7	97	46.9	47	22.7
Grant	893	201.3	30	18.0	62	25.2	284	63.1	73	16.5
Greene	413	194.6	X	X	X	X	144	67.5	34	16.0
Hamilton	1,618	154.2 ↓	75	19.4	141	22.1	375	36.4 ↓	124	11.4 ↓
Hancock	677	185.5	24	17.0	50	23.8	220	60.6	47	13.2
Harrison	385	173.6	X	X	23	19.2	132	59.7	25	11.3
Hendricks	1,121	169.5 ↓	44	18.6	81	20.7	329	50.8	83	12.1 ↓
Henry	624	196.4	24	20.2	32	18.5	213	68.0 ↑	50	15.4
Howard	936	176.3	31	15.9	61	20.8	299	56.3	74	13.7
Huntington	445	197.5	27	30.4	33	25.4	119	52.3	39	17.6
Jackson	512	207.5 ↑	26	26.2	25	18.7	171	68.1	46	18.9
Jasper	384	208.0	21	29.4	33	32.3	140	75.4 ↑	25	13.6
Jay	273	211.9	X	X	X	X	80	62.6	32	24.9
Jefferson	323	169.0	X	X	X	X	109	55.9	29	15.2
Jennings	318	217.3 ↑	X	X	X	X	110	71.5 ↑	23	16.9
Johnson	1,215	171.6 ↓	48	17.8	70	17.5	376	53.0	109	14.9
Knox	439	181.0	X	X	27	19.9	130	53.7	50	20.3
Kosciusko	800	188.3	40	25.5	50	21.2	242	56.7	66	15.0
LaGrange	295	168.9	X	X	X	X	80	45.7	29	15.6
Lake	5,333	194.8 ↑	245	22.4	403	26.2 ↑	1,497	54.8	546	20.1 ↑
LaPorte	1,278	195.5	67	27.4	91	25.8	362	55.7	133	19.7
Lawrence	570	188.9	X	X	40	24.0	185	60.8	55	18.1

County	All Cancers		Prostate (Male-only disease)		Female Breast		Lung		Colon and Rectum	
	Count	Rate	Count	Rate	Count	Rate	Count	Rate	Count	Rate
Madison	1,573	194.2	63	20.0	94	21.0	546	67.5 ↑	129	15.7
Marion	8,503	203.2 ↑	394	25.8 ↑	601	24.9	2719	65.4 ↑	704	16.7
Marshall	462	163.8 ↓	23	21.9	30	18.9	128	46.0 ↓	38	13.3
Martin	125	189.3	X	X	X	X	38	58.7	X	X
Miami	409	192.6	X	X	21	19.5	145	68.1	25	11.8
Monroe	1,014	172.1 ↓	49	21.8	68	20.5	292	49.7 ↓	79	13.7
Montgomery	415	177.7	20	19.9	20	14.8	131	57.1	36	15.3
Morgan	721	196.9	29	25.2	49	23.8	242	63.1	62	17.1
Newton	179	197.0	X	X	X	X	56	60.3	23	25.1
Noble	473	189.7	29	30.8	38	29.3	133	52.8	51	20.7
Ohio	77	198.2	X	X	X	X	32	81.0	X	X
Orange	257	206.6	X	X	X	X	94	73.7 ↑	20	15.4
Owen	269	214.2	X	X	20	29.1	86	65.4	21	18.4
Parke	200	188.6	X	X	X	X	68	61.1	X	X
Perry	257	212.7	X	X	X	X	93	79.4 ↑	31	24.6
Pike	155	180.3	X	X	X	X	54	60.8	X	X
Porter	1,567	180.6	76	23.4	119	24.2	468	53.8	150	17.4
Posey	255	165.2	X	X	X	X	64	41.5 ↓	21	13.5
Pulaski	170	192.4	X	X	X	X	50	55.4	X	X
Putnam	413	196.9	X	X	23	20.6	158	74.9 ↑	54	25.4 ↑
Randolph	335	193.1	20	26.2	X	X	100	56.9	32	18.7
Ripley	343	200.5	X	X	X	X	98	58.1	35	20.9
Rush	226	209.0	X	X	X	X	70	63.1	X	X
Scott	285	217.2 ↑	X	X	X	X	108	78.8 ↑	22	17.2
Shelby	478	186.9	X	X	28	20.2	151	58.6	40	14.9
Spencer	231	181.0	X	X	X	X	70	53.7	29	22.2
St. Joseph	2,717	180.5	143	23.5	178	20.9	780	52.4 ↓	245	16.3
Starke	306	219.0 ↑	X	X	23	31.4	108	72.7 ↑	21	15.0
Steuben	346	170.4	21	26.0	31	26.2	99	46.7	29	14.7
Sullivan	284	217.5 ↑	X	X	X	X	87	65.5	27	21.1
Switzerland	139	229.5 ↑	X	X	X	X	51	81.2 ↑	X	X
Tippecanoe	1,200	172.5 ↓	49	17.9	107	26.5	330	48.9 ↓	120	17.1
Tipton	177	163.6	X	X	X	X	46	42.9	23	20.3
Union	75	173.4	X	X	X	X	25	56.9	X	X
Vanderburgh	1,987	187.0	83	19.3	138	24.0	617	58.6	150	13.8
Vermillion	220	205.2	X	X	X	X	87	79.1 ↑	25	25.0
Vigo	1,200	202.1 ↑	39	17.2	82	24.3	398	68.1 ↑	101	16.7
Wabash	432	186.3	29	29.6	25	18.9	115	52.3	39	15.2
Warren	94	172.2	X	X	X	X	32	58.4	X	X
Warrick	554	167.5 ↓	33	27.2	44	24.1	153	46.0 ↓	40	12.3
Washington	323	206.4	X	X	X	X	117	73.7 ↑	23	15.6
Wayne	902	202.0 ↑	27	14.5	52	21.3	292	66.1 ↑	74	16.2
Wells	266	150.7 ↓	X	X	X	X	77	44.4 ↓	28	15.7
White	339	204.2	X	X	20	22.1	113	66.8	29	17.7
Whitley	371	189.8	32	44.1 ↑	24	21.8	107	54.1	30	15.7

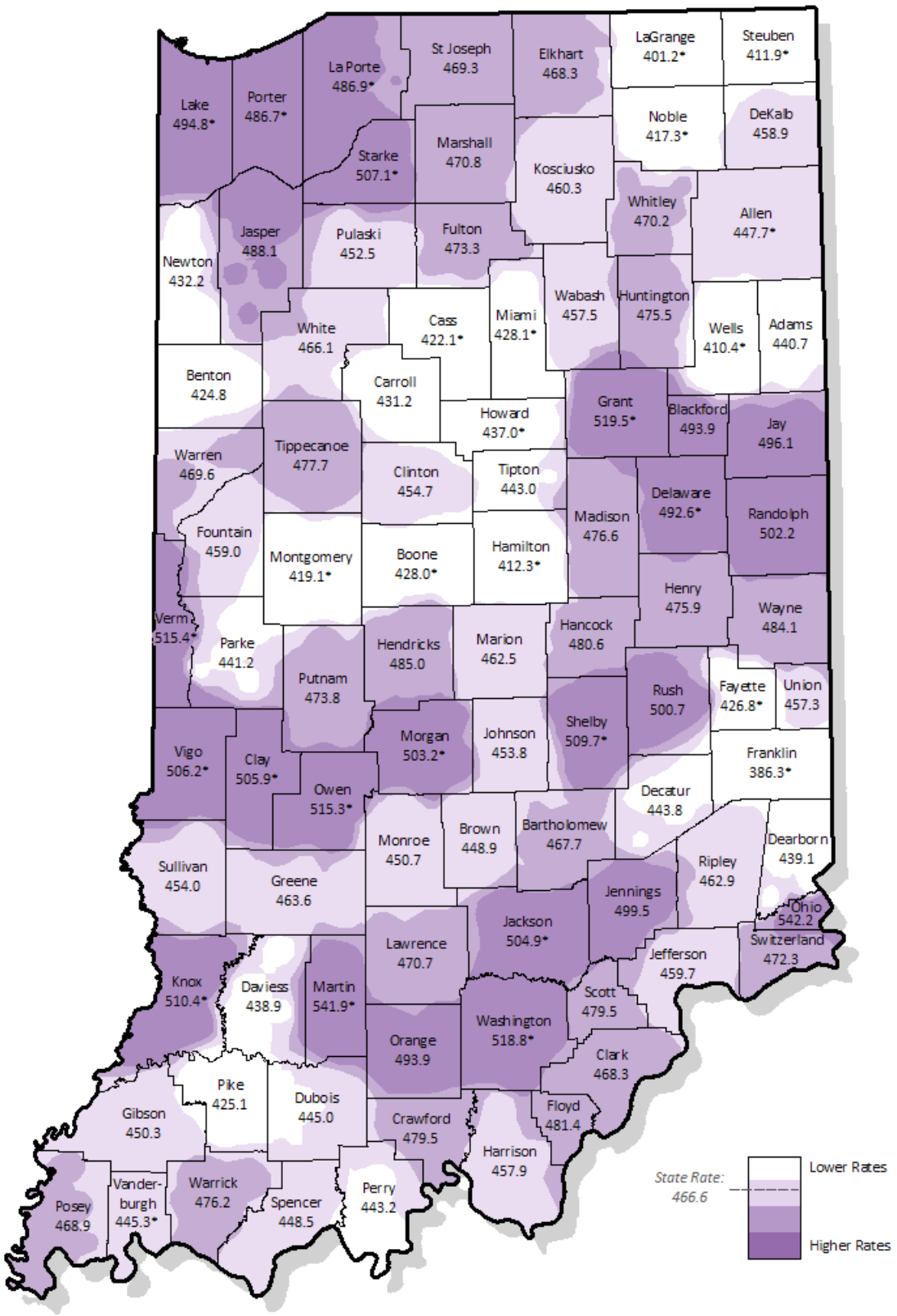
** Rates are per 100,000 people and age-adjusted to the 2000 US Standard Population*

† "↑↓" symbols denote whether the county's rate is significantly different than the Indiana rate based on the 95% confidence interval overlap method (see Page 4 for description). Because of limitations of this method, some of the counties without ↑↓ symbols could still have significantly different rates than the state.

"x" Rate and comparison to state rate is suppressed if fewer than 20 deaths occurred because rate is considered unstable; counts <5 are suppressed to maintain confidentiality.

Source: Indiana State Cancer Registry

Map 1. Incidence Rates for All Cancers Combined by County — Indiana, 2008-2012



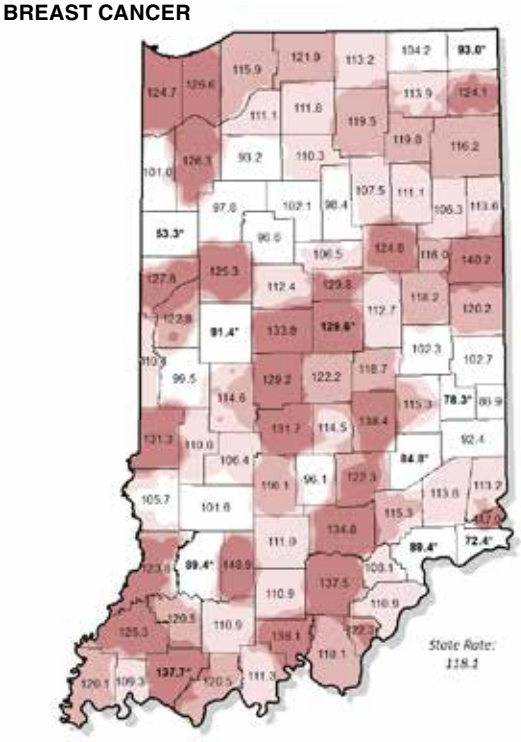
** Significantly different (higher or lower) than state rate (P<.05)*

Technical note: This map presents age-adjusted county incidence rates using a smoothed interpolated surface and is intended to provide a generalized depiction of rate variability throughout the state.

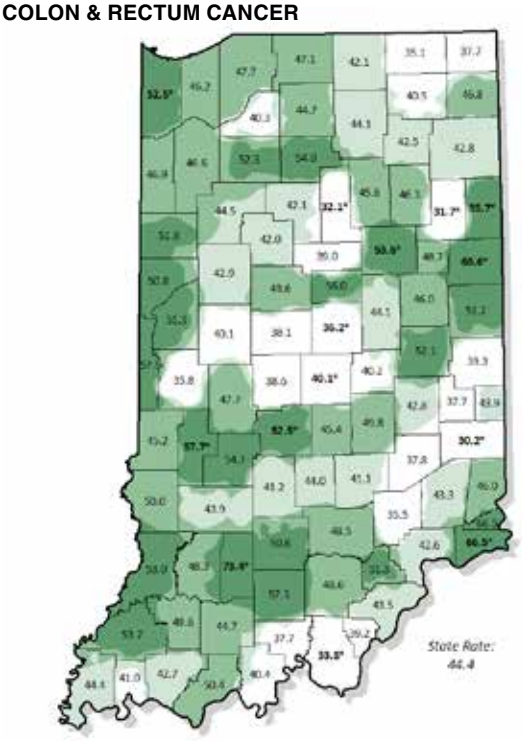
Source: Indiana State Cancer Registry

Map 2. Incidence Rates for Selected Cancer Types by County — Indiana, 2008-2012

BREAST CANCER

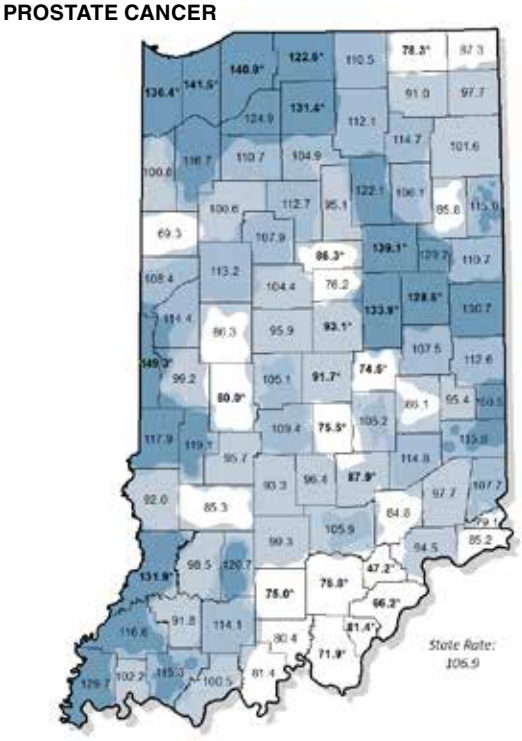


COLON & RECTUM CANCER



Lower Rates → Higher Rates

PROSTATE CANCER



LUNG CANCER

** Significantly different (higher or lower) than state rate (P<.05)*

Technical note: This map presents age-adjusted county incidence rates using a smoothed interpolated surface and is intended to provide a generalized depiction of rate variability throughout the state.

Source: Indiana State Cancer Registry

What is the Impact on Indiana Residents?

Table 5. Burden of Invasive Female* Breast Cancer — Indiana, 2008–2012

	Average number of cases per year (2008–2012)	Rate per 100,000 females† (2008–2012)	Number of cases (2012)	Rate per 100,000 females† (2012)
Indiana Incidence	4,415	118.1	4,366	115.7
Indiana Deaths	882	22.6	872	21.9

** Fewer than 40 cases of breast cancer occur among Indiana males each year. The annual incidence rate (typically around 1.0 case per 100,000 males) remained stable during 2008-2012.*

† Age-adjusted

Source: Indiana State Cancer Registry

Bottom Line

Breast cancer is the second leading cause of cancer death and, excluding skin cancers, the most frequently diagnosed cancer among females in the US.[1] The lifetime risk of developing breast cancer among females is one in eight.[1] Breast cancer is typically diagnosed during a screening examination. An estimated 231,840 new cases of invasive breast cancer and 40,290 breast cancer-related deaths are expected to occur among females nationally in 2015.[1] White and African American females have similar incidence rates; however, African American females have significantly higher mortality rates.[2] This may be, in part, because of late diagnosis, diagnosis in younger individuals, and barriers to healthcare access [Figure 9].[2] Today, there are 3 million US females who are breast cancer survivors. Females should have frequent conversations with their health care provider about their risks for breast cancer and how often they should be screened. Breast cancer is rare among males as an estimated 2,350 cases will occur in 2015.[1] However, because males are prone to ignoring warning signs, they are often diagnosed at later stages and have poorer prognoses. During 2015, it is estimated that 440 males are expected to die nationally from breast cancer.

Who Gets Breast Cancer?

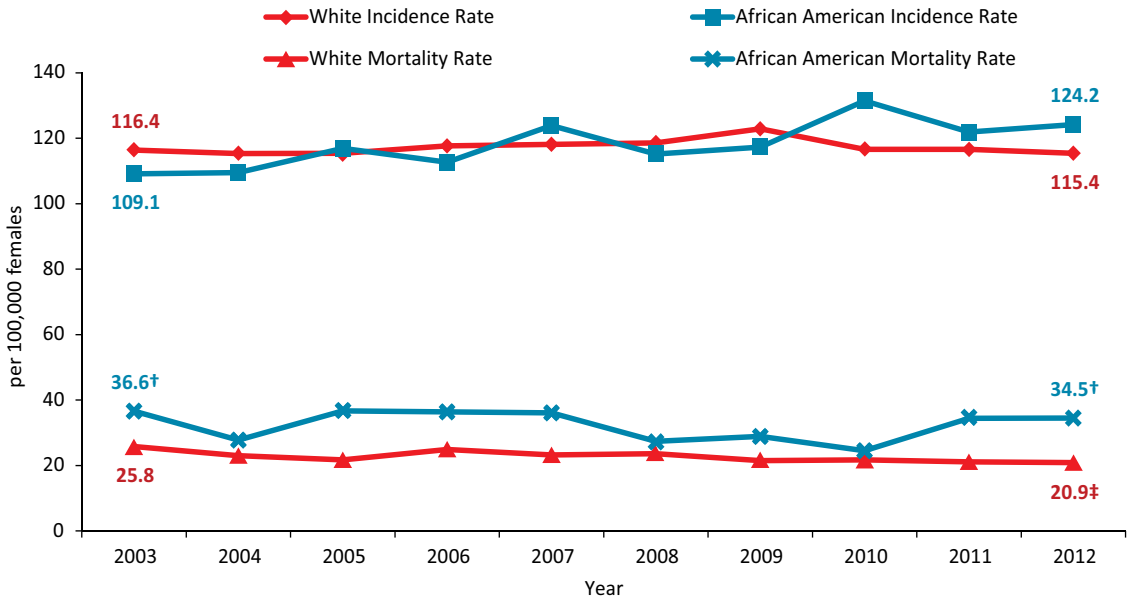
Sex and **age** are the two greatest risk factors for developing breast cancer. Females have a much greater risk of developing breast cancer (>99% of Indiana cases occur among females), and that risk increases with age. Overall, in Indiana, 79 percent of all breast cancer incidence and 88 percent of breast cancer deaths occur in females over the age of 50.

Factors associated with increased breast cancer risk include weight gain after the age of 18, being overweight or obese, use of menopausal hormone therapy, physical inactivity, and alcohol consumption. Research also indicates that long-term, heavy smoking increases breast cancer risk, particularly among females who start smoking before their first pregnancy.

Additional risk factors include:

- **Family history** — Females who have had one or more first degree relatives who have been diagnosed with breast cancer have an increased risk. Additionally, breast cancer risk increases if a woman has a family member who carries the breast cancer susceptibility genes (BRCA) 1 or 2, which accounts for five to ten percent of all female breast cancers. BRCA mutations also account for five to 20 percent of all male breast cancers, and 15 to 20 percent of familial breast cancers.[1]
- **Race** — In Indiana, during 2008-2012, the breast cancer incidence rates for African American and white females were similar, but the mortality rate for African American females was 39 percent higher than for whites.[3] African American females had significantly higher rates of diagnosis at the regional or distant stage [Figure 10].
- **Reproductive factors** — Females may have an increased risk if they have a long menstrual history (menstrual periods that start early and/or end later in life), have recently used oral contraceptives or Depo-Provera, have never had children, or had their first child after the age of 30.[1]
- **Certain medical findings** — High breast tissue density, high bone mineral density, type 2 diabetes, certain benign breast conditions, and lobular carcinoma in situ may increase risk

Figure 9. Female Breast Cancer Incidence and Mortality (Death) Rates Trends by Race* — Indiana, 2003–2012



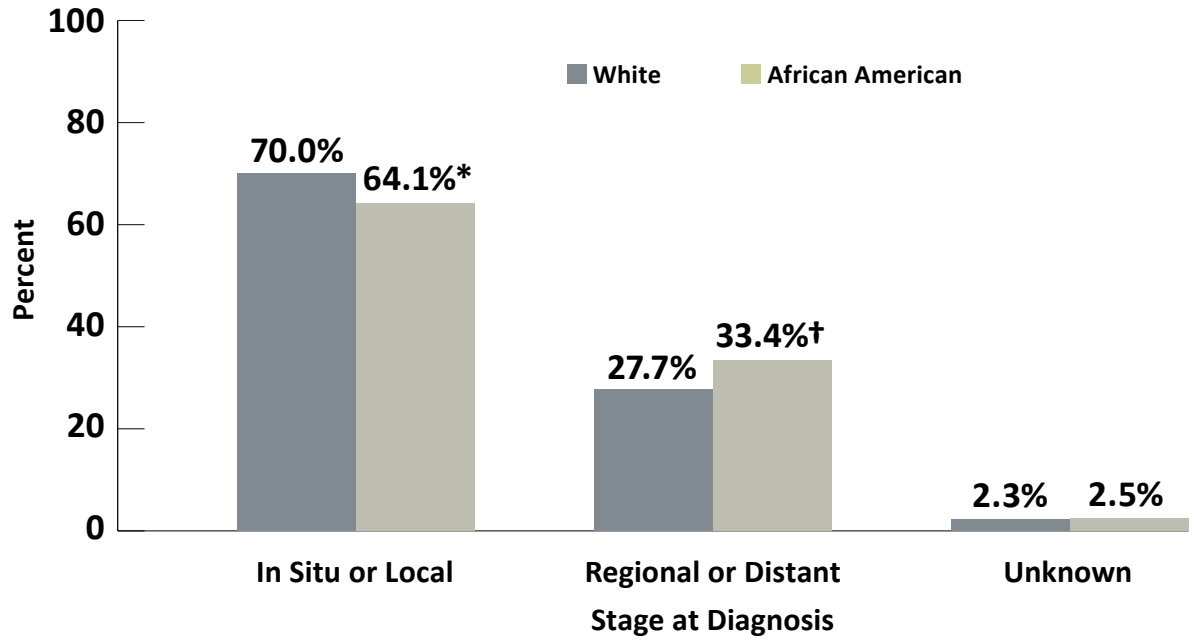
** Age-adjusted*

† Rate among African-Americans was significantly higher than rate among whites (P<.05)

‡ The breast cancer mortality rate among white females was significantly lower (P<.05) in 2012 compared to 2003

Source: Indiana State Cancer Registry

Figure 10. Percent of Female Breast Cancer Cases by Stage of Diagnosis and Race — Indiana, 2008–2012



* *Proportion of cases diagnosed in the local stage was significantly lower (P<.05) among African American females when compared to white females, but significantly higher than whites for the in situ stage.*

† *Proportion of cases diagnosed in the regional or distant stage was significantly higher (P<.05) among African American females when compared to white females*

Source: Indiana State Cancer Registry

BE AWARE!

Common Signs and Symptoms of Breast Cancer

- The most common symptom of breast cancer is a new lump or mass. It's important to have anything new or unusual checked by a doctor.
- Other symptoms of breast cancer may include:
  - Hard knots, or thickening
  - Swelling, warmth, redness, or darkening
  - Change in size or shape
  - Dimpling or puckering of the skin
  - Itchy, scaly sore, or rash on the nipple
  - Pulling in of the nipple or other parts of the breast
  - Nipple discharge that starts suddenly
  - New pain in one spot that doesn't go away

Although these symptoms can be caused by things other than breast cancer, it is important to have them checked out by your doctor.

for developing breast cancer. In addition, high dose radiation to the chest for cancer treatment increases risk.[1]

Factors associated with a decreased risk of breast cancer include breastfeeding, regular moderate or vigorous physical activity, and maintaining a healthy body weight. Two medications — tamoxifen and raloxifene — have been approved to reduce breast cancer risk in female at high risk.[1]

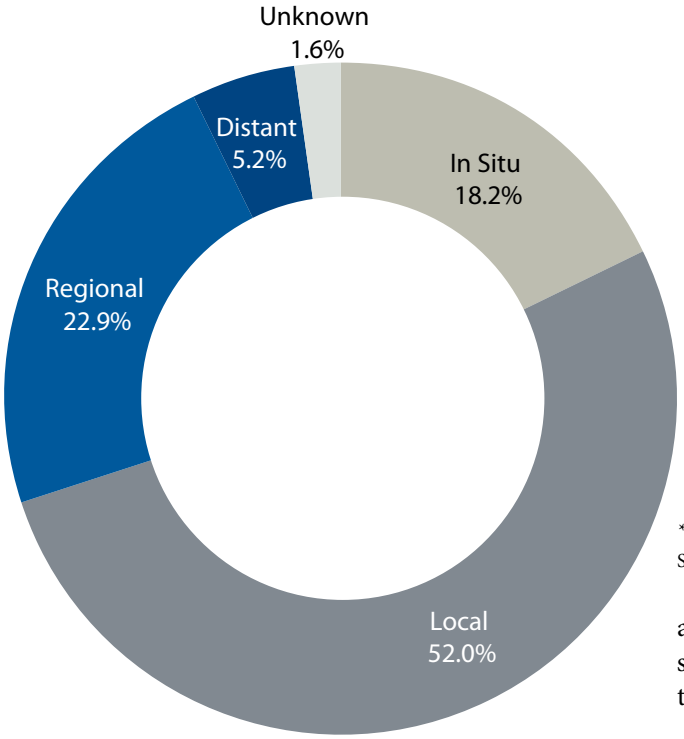
Can Breast Cancer Be Detected Early? — *see the "Be Aware" box for additional information*

Females should have frequent conversations with their health care provider about their risks for breast cancer and how often they should be screened. In general, females should follow these recommendations:

- **Breast Self-Awareness.** Females in their 20s should be aware of the normal look and feel of their breasts, so that they can identify potentially dangerous changes.
- **Clinical Breast Exams.** The American Cancer Society recommends that females in their 20s and 30s have a clinical breast exam by a health care professional every three years. Asymptomatic females in their 40s should have yearly clinical breast exams.
- **Screening Mammograms.** The United States Preventive Services Task Force recommends a screening mammogram every two years for females aged 50 to 74, which help detect cancers before a lump can be felt. Females between the ages of 40 to 49, especially those with a family history of breast cancer, should discuss the risks and benefits of mammography with their health provider to determine if it is right for them.

According to the 2012 Indiana Behavioral Risk Factor Surveillance System (BRFSS), only 69.5 percent of females ages

Figure 11. Percent of Female Breast Cancer Cases Diagnosed During Each Stage* — Indiana, 2008–2012



During 2008–2012, of the 26,996 female Indiana residents who received a breast cancer diagnosis, 18,969 (70%) were diagnosed in the in situ or local stage, 7,608 (28.2%) were diagnosed in the regional or distant stage, and 419 (1.6%) had unknown staging.

** Includes all in situ and invasive cases*
Source: Indiana State Cancer Registry

50 and older had a mammogram during the past two years. The Affordable Care Act requires preventive screening services to be included in most insurance policies. Often, these services are paid in full. Individuals should check with their individual insurance providers for specific plan information.

What Factors Influence Breast Cancer Survival?

Staging of breast cancer takes into account the number of lymph nodes involved and whether the cancer has moved to a secondary location [Figure 11]. When breast cancer is detected early, before it is able to be felt, the five-year survival rate is 99 percent.[1] During 2012, in Indiana, only 52 percent of breast cancer cases were diagnosed at the local stage. Approximately 18 percent were diagnosed in situ (the earliest stage possible for diagnosis).[3] During this same time, almost 30 percent of Indiana's breast cancer cases were diagnosed in the regional or distant stages.[3]

There are multiple treatment options available for breast cancer patients. Surgical treatment options include mastectomy (the medical term for the surgical removal of one or both breasts, either partially or completely) and lumpectomy (the removal of only the cancerous area of the breast). Local radiation can be used to treat the tumor without affecting the rest of the body. Other treatments include chemotherapy, hormone therapy, and targeted therapy. These can be given orally or intravenously in order to reach cancer cells anywhere in the body. An individual's treatment plan is personalized and based both on medical and personal choices. Individuals should partner with their medical providers and be active participants in the development of a treatment and care plan.

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TAKE CHARGE!

What You Can Do to Help Prevent Breast Cancer

- Know your risk! Talk to your doctor about your personal and family history, and screening.
- Get screened regularly.
- Be smoke free! Visit www.in.gov/quitline for free, evidence-based smoking cessation assistance.
- Maintain a healthy weight.
- Adopt a physically active lifestyle.
- Limit alcohol consumption.
- Limit postmenopausal hormone use. When evaluating treatment options for menopausal symptoms, consider the increased risk of breast cancer associated with the use of estrogen and progestin and discuss this with your physician.
- Breastfeed, if you can. Studies suggest that breastfeeding for one year or more slightly reduces a woman's overall risk of breast cancer.

What is the Impact on Indiana Residents?

Table 6. Burden of Invasive Cervical Cancer — Indiana, 2008–2012

	Average number of cases per year (2008–2012)	Rate per 100,000 females† (2008–2012)	Number of cases (2012)	Rate per 100,000 females† (2012)
Indiana Incidence	250	7.4	240	7.1
Indiana Deaths	86	2.4	100	2.7

† Age-adjusted

Source: Indiana State Cancer Registry

Cervical Cancer

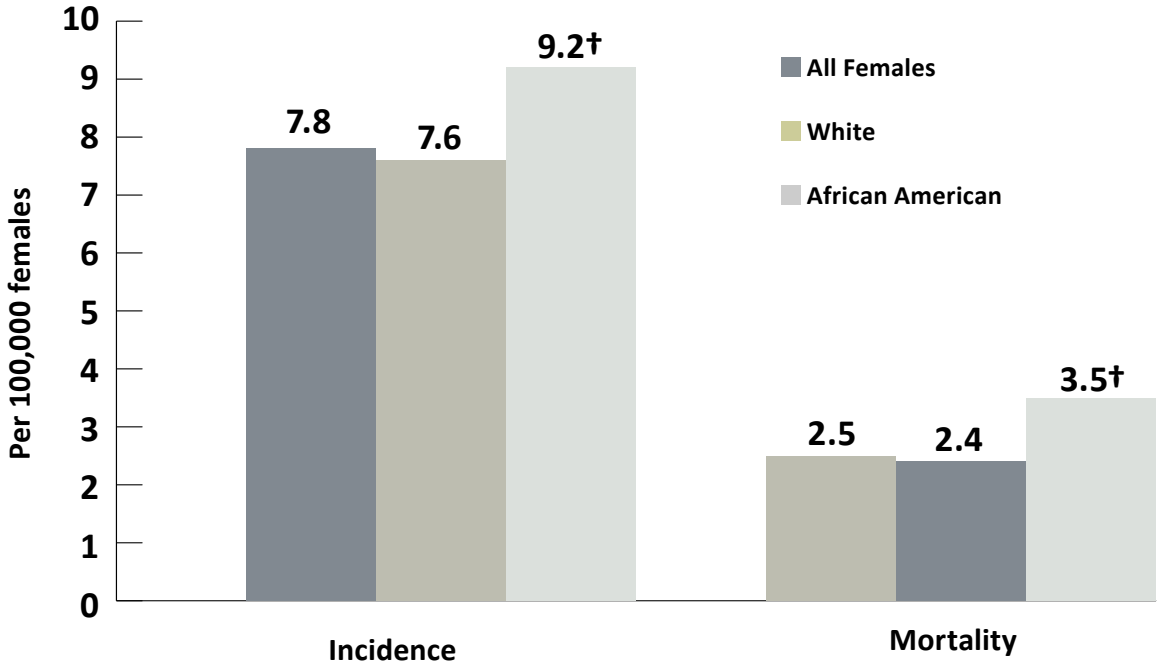
Bottom Line

Cervical cancer is almost 100 percent preventable through regular routine screening, avoidance of controllable risk factors, and vaccination against the human papillomavirus (HPV). In the US, an estimated 12,900 cases of invasive cervical cancer cases will be diagnosed in 2015 and 4,100 deaths will occur.[1] Large declines in incidence rates over most of the past several decades have begun to taper off, particularly among younger females; from 2006 to 2010, rates were stable in females younger than 50, and decreasing by only 3.1 percent in females ages 50 and older.[1] In Indiana, approximately 250 new cases of cervical cancer and 86 cervical cancer-related deaths occur annually among females [Table 6].

Who Gets Cervical Cancer?

- Infection with HPV is the single greatest risk factor for cervical cancer. Most cervical cancers are caused by persistent infection with certain types of HPV. The CDC estimates that at least 91 percent of cervical cancer cases are caused by HPV each year.[2] Other risk factors for cervical cancer include a compromised immune system and smoking.
- HPV is passed person-to-person through skin-to-skin sexual contact. Risk of transmission can be reduced by delaying first sexual activity, limiting the number of sexual partners, and using condoms.
- HPV vaccination is the best method of prevention. There are two vaccines (Cervarix and Gardasil) for females that are approved ages 9 through 26. HPV vaccination is routinely recommended for girls ages 11 and 12 and for females ages 13 through 26 who did not get any or all of the doses when they were younger. One vaccine (Gardasil) is approved for males ages 9 through 26. HPV vaccination is routinely recommended for males ages 11 and 12 and for males ages 13 through 21 who did not get any or all of the doses when they were younger. Vaccination is routinely recommended for immunocompromised males and for males who have sex with males who are ages 22-26.[3] A new vaccine, Gardasil 9, has recently been approved by the Food and Drug Administration, which would protect against nine strains of HPV and can prevent almost 90 percent of HPV-related cervical cancers. Due to the recent approval of Gardasil 9, it has not yet been included in vaccination recommendations.
- According to the National Immunization Survey (NIS), in 2013 only 54 percent of girls and 18 percent of boys ages 13 through 17 in Indiana received the first in the three dose series of HPV vaccine.[4] Only 71 percent of girls in Indiana who began the series got all three shots.[4]
- Indiana females are most often diagnosed with cervical cancer during their middle adult years. During 2012, 85 percent of cervical cancer cases occurred among Indiana females less than 65 years-old, including 38 percent of cases occurring among females ages 25 to 44 and 46 percent among females ages 45 to 64.[5]
- During 2003-2012, African American females in Indiana, compared to white females, had a 21 percent higher cervical cancer incidence rate (9.2 versus 7.6 cases per 100,000 females, respectively) and a 46 percent higher mortality

Figure 12. Cervical Cancer Incidence and Mortality (Death) Rates by Race* — Indiana, 2003–2012

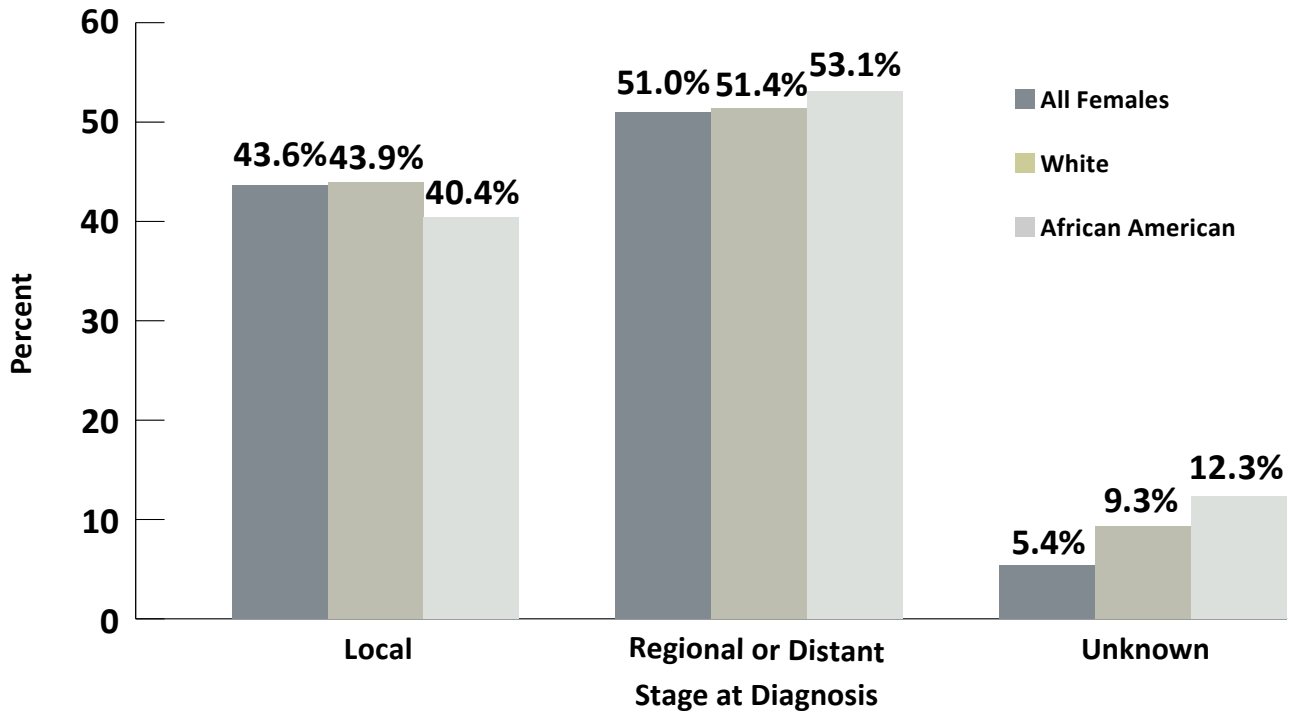


* *Age-adjusted*

† *Rate among African American females is significantly higher (P<.05) than the rate among white females*

Source: Indiana State Cancer Registry

Figure 13. Percent of Cervical Cancer Cases by Stage of Diagnosis and Race* — Indiana, 2003–2012



** Proportion of cases diagnosed in the regional or distant stage compared to the local stage is significantly higher (P<.05) among African American females than among white females*

Source: Indiana State Cancer Registry

rate (3.5 versus 2.4 deaths per 100,000 females, respectively) [Figure 12]. While many factors are probably impacting this disparity, one apparent issue is that African American females tend to be diagnosed more often after the cervical cancer is no longer localized [Figure 13].[5]

Can Cervical Cancer Be Detected Early?

In the US, the cervical cancer mortality rate declined by almost 70 percent between 1955 and 1992, mainly because of the effectiveness of Pap smear screening.[3] Pap screenings allow for early identification and treatment of abnormal cervical cells before they become cancerous. This is important because, typically, the pre-cancerous conditions do not cause pain or other symptoms and are only detected through Pap screenings.

The American Cancer Society, in collaboration with the American Society for Colposcopy and Cervical Pathology and the American Society for Clinical Pathology recommend all average-risk females ages 21 through 65 receive a routine Pap screening every three years. The preferred screening method for females ages 30 through 35 is a HPV and Pap test (called co-testing) every five years.[1]

In 2012, 73.2 percent of Indiana females ages 18 and older reported having had a Pap screen during the past three years. This rate was similar for all racial and ethnic groups.[5]

What Factors Influence Cervical Cancer Survival?

Figure 14 provides the percent of Indiana females diagnosed during each stage of cervical cancer during 2008-2012. The five-year survival rate for patients diagnosed with cervical cancer at the local stage is 91 percent.[1]

In Indiana, from 2003-2007 to 2008-2012, the incidence of cervical cancer decreased, but the mortality rate remained constant [Figure 15]. There is no clear reason for this finding; however, it might be because while routine screening is catching most cases of cervical cancer prior to it becoming invasive, there still remains a consistent group of females who are not being screened and are diagnosed after the cancer has spread. These females are at increased risk for poor health outcomes.

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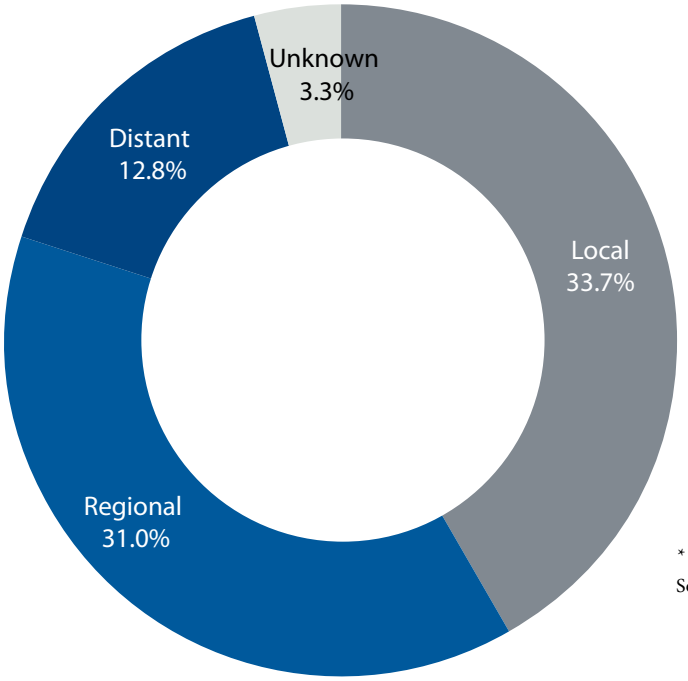
[2] Centers for Disease Control and Prevention. *How Many Cancer are Linked with HPV Each year?* Atlanta, GA. 2011. Accessed at http://www.cdc.gov/cancer/hpv/statistics/cases.htm on April 16, 2014.

[3] Centers for Disease Control and Prevention. *Human Papillomavirus.* Atlanta, GA. 2011. Accessed at http://www.

Figure 14. Percent of Cervical Cancer Cases Diagnosed During Each Stage* — Indiana, 2008–2012

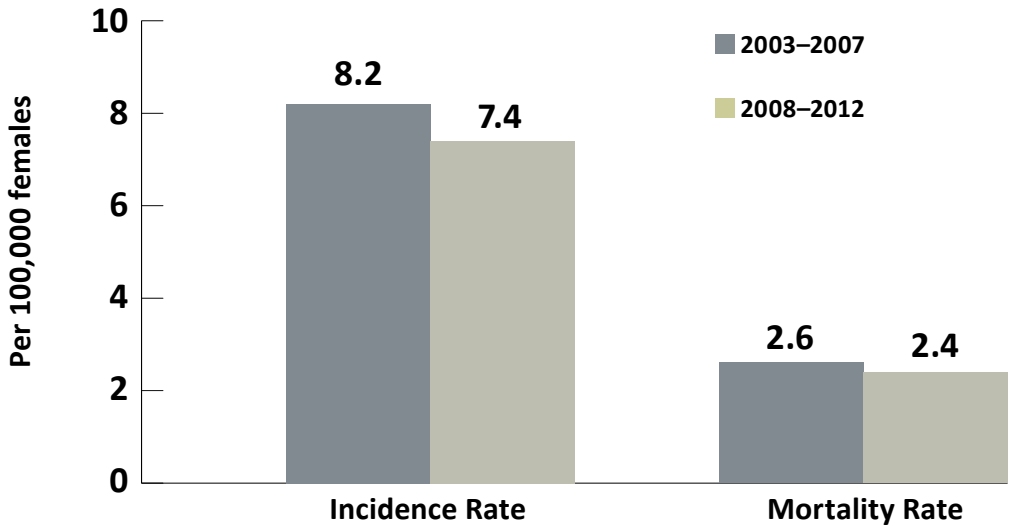


During 2008–2012, of the 1,547 Indiana females who received a diagnosis of invasive cervical cancer, 521 (33.7 percent) were diagnosed in the local stage, 677 (43.8 percent) were diagnosed in the regional or distant stage, and 51 (3.3 percent) had unknown staging.

** Only includes invasive cases; in situ cases are not reportable*

Source: Indiana State Cancer Registry

Figure 15. Changes in Cervical Cancer Incidence and Mortality (Death) Rates among Indiana Females between the Five-year Periods of 2003–2007 and 2008–2012*



** Age-adjusted*

Source: Indiana State Cancer Registry

cdc.gov/hpv/vaccine.html on April 16, 2014.

[4] Centers for Disease Control and Prevention, Immunization Managers. Accessed at http://www.cdc.gov/vaccines/imz-managers/coverage/nis/teen/figures/2013-map.html on January 12, 2015.

[5] Indiana State Cancer Registry Statistics Report Generator. Accessed at http://www.in.gov/isdh/24360.htm on June 16, 2014.

Take Charge!

What You Can Do to Help Prevent Cervical Cancer

- Get vaccinated — Protecting yourself from HPV decreases your risk for cervical and other cancers.
- Practice safe sex.
- Be smoke-free — Visit www.in.gov/quitline for free smoking cessation assistance.
- Have routine Pap screenings.
- Ask for an HPV test with your Pap smear if you are age 30 or older.
- Watch for abnormal vaginal discharge and bleeding.

What is the Impact on Indiana Residents?

Table 7. Burden of Cancer among Children Ages 0–19 Years — Indiana, 2008-2012

	Average number of cases per year (2008–2012)	Rate per 100,000 children* (2008–2012)	Number of cases (2012)	Rate per 100,000 children* (2012)
Indiana Incidence	368	20.5	378	21.1
Indiana Deaths	42	2.3	46	2.6

** Age-specific*

Source: Indiana State Cancer Registry

Bottom Line

The occurrence of cancer during childhood is rare, representing approximately one percent of all new cancer diagnoses in the US.[1] Although uncommon, cancer is the second leading cause of death among children ages five to 14, exceeded only by accidents.[1] Between 2008-2012, 368 cases of cancer and 42 cancer-related deaths occurred each year among Indiana children ages 0–19 [Table 7]. In general, childhood cancer trends in Indiana are similar to what is seen nationwide. For most cases of childhood cancer, the cause is unknown.

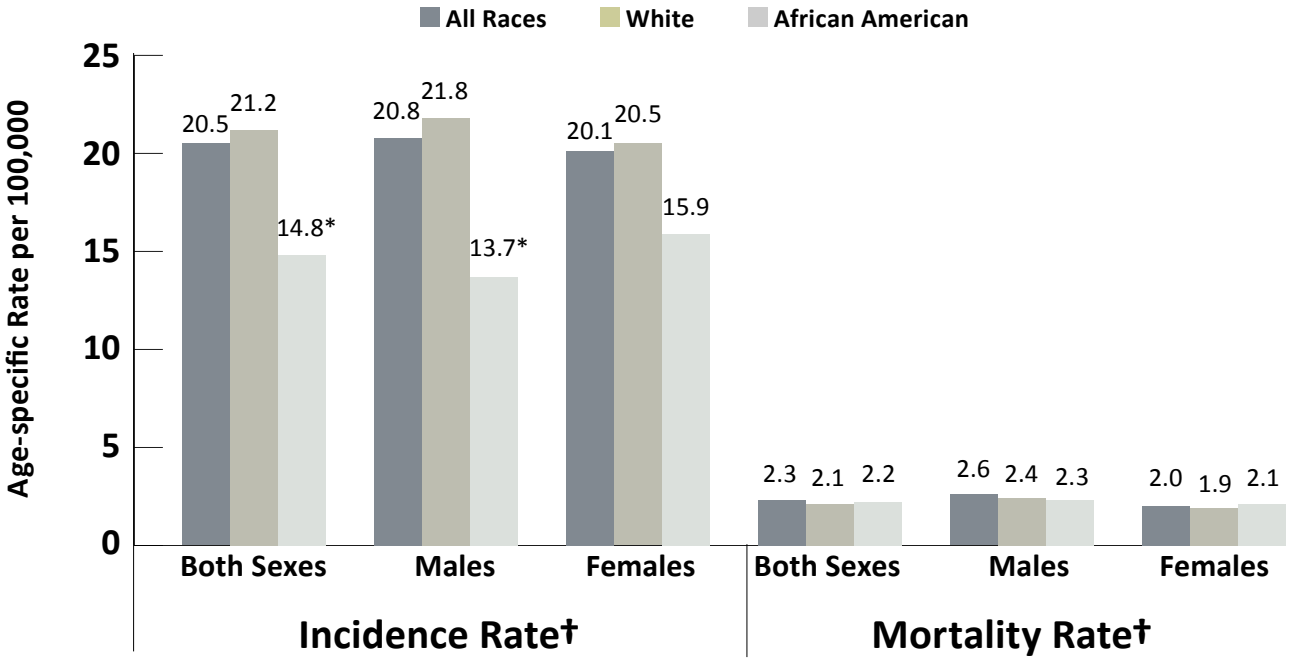
The incidence rate of cancer among Indiana children ages 0–19 during 2008-2012 was 20.5 cases per 100,000 children, which was similar to the national rate of 19.1 cases per 100,000 children for 2007–2011, the most recent years for which national data are available.[2] In Indiana, the childhood cancer mortality rate was 2.3 deaths per 100,000 children compared to the US mortality rate of 2.4 deaths per 100,000 children [Figure 16].[2]

Using the International Classification of Childhood Cancer system, the most common cancer types diagnosed among Indiana children ages 0–14 were leukemias and brain tumors. In children ages 15–19, the most common cancer types were lymphomas and a group of cancers that include epithelial cancers (cancers that develop from the cellular covering of internal and external body surfaces or related tissues in the skin, hollow viscera and other organs) and melanoma.

Who Most Often Gets Childhood Cancer?

- **White children.** During 2008-2012, in Indiana, white children had a significantly higher incidence rate than African American children (21.2 versus 14.8 per 100,000 children, respectively) [Figure 16]. This difference in rates between races is also seen nationally. The reasons for these differences are not known.[1]
- **Children born with certain genetic disorders or familial syndromes**. Children with a familial neoplastic syndrome, inherited immunodeficiency, certain genetic syndromes, and chromosomal abnormalities are at greater risk for developing various types of childhood cancer.[3]
- **Males born with undescended testes.** They are at greater risk for testicular cancer.[3]
- **Additional risk factors include:**[3]
  - Radiation exposure, especially prenatally (includes x-rays);
  - Tanning bed or sun exposure increases the risk of melanoma, one of the more common cancers among teenagers;
  - Prior chemotherapy with an alkylating agent or epipodophyllotoxin;
  - Infection with the Epstein-Barr virus is associated with certain types of lymphoma; and
  - Insecticide exposure, especially prenatally, is associated with leukemia.

Figure 16. Incidence and Mortality (Death) Rates among Children Ages 0–19 Years by Sex and Race — Indiana, 2008–2012

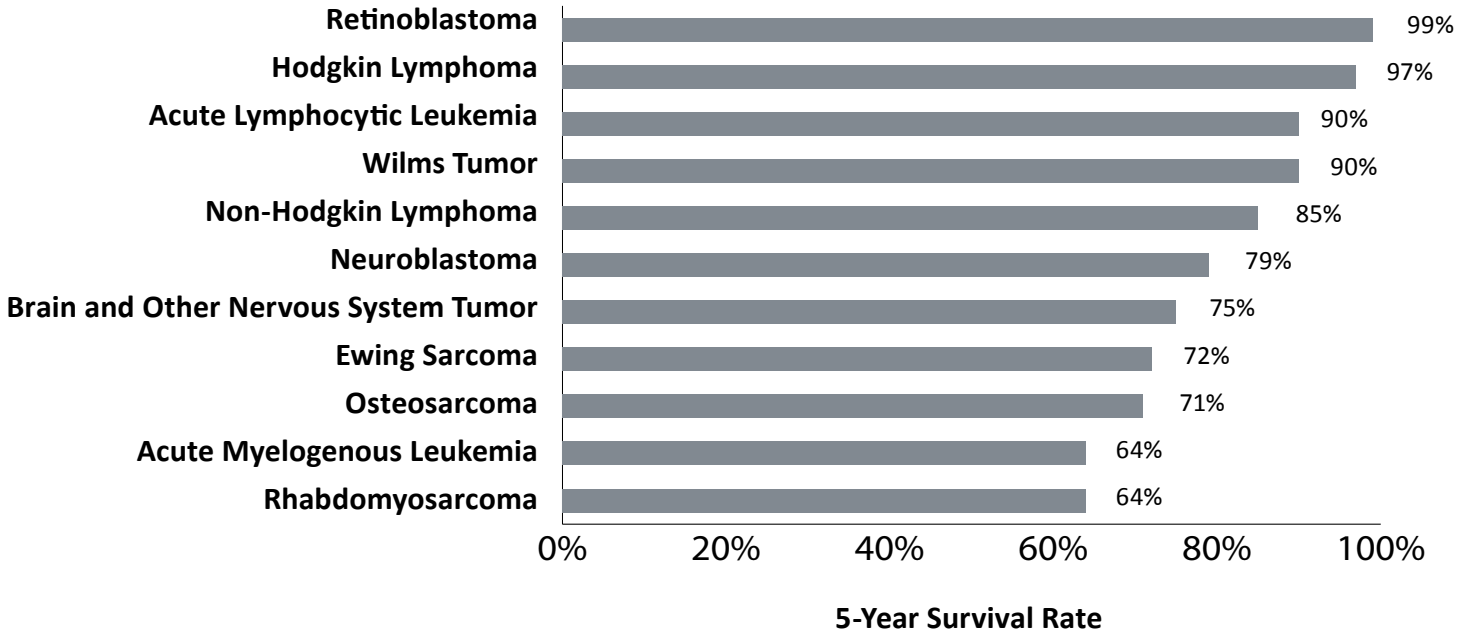


** Rate is significantly lower (P<.05) among African Americans than among whites*

† Age-specific rate per 100,000 children

Source: Indiana State Cancer Registry

Figure 17. Five-year Survival Rates for the Most Common Childhood Cancers — United States, 2003–2009



Source: American Cancer Society. Childhood Cancer. Atlanta, GA. 2011. Accessed at www.cancer.org/acs/groups/cid/documents/webcontent/002287-pdf.pdf on June 03, 2013.

Can Childhood Cancer Be Detected Early? — *see "Be Aware" box for additional information*

Early symptoms are usually nonspecific. Parents should ensure that children have regular medical checkups and should be aware of any unusual symptoms that persist.

What Factors Influence Childhood Cancer Survival?

Overall, US childhood deaths due to cancer have dropped more than 50 percent since 1975 because of improved treatment options. The five-year survival rate for childhood cancers is now 83 percent.[1] However, rates vary considerably depending on cancer type; moreover, within the major categories, cancer subtypes might vary in response to treatment or survival characteristics [Figure 17].

The earlier a cancer is diagnosed and treated, the better. Childhood cancers can be treated by a combination of therapies (surgery, radiation, and chemotherapy) chosen based on the type and stage of cancer. Treatment is coordinated by a team of experts, including pediatric oncologists, pediatric nurses, social workers, psychologists, and others. Because these cancers are uncommon, outcomes are more successful when treatment is managed by a children's cancer center.[1]

Survivors of childhood cancer might experience treatment-related side effects. Information for survivors of childhood cancer is available at www.survivorshipguidelines.org.

BE AWARE!

Common Signs and Symptoms of Childhood Cancer

Childhood cancer is rare, but your child should be examined by a health care provider if you notice any of these potential cancer-related signs and symptoms:

- Unusual mass or swelling
- Unexplained paleness or loss of energy
- Sudden tendency to bruise
- Persistent, localized pain
- Prolonged, unexplained fever or illness
- Frequent headaches, often with vomiting
- Sudden eye or vision changes
- Excessive, rapid weight loss

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What is the Impact on Indiana Residents?

Table 8. Burden of Invasive Colon and Rectum Cancer — Indiana, 2008–2012

	Average number of cases per year (2008–2012)	Rate per 100,000 people* (2008–2012)	Number of cases (2012)	Rate per 100,000 people* (2012)
Indiana Incidence (New cases)	3,097	44.4	2,825	39.6
Indiana Mortality (Deaths)	1,164	16.6	1,169	16.3

** Age-adjusted*

Source: Indiana State Cancer Registry

Colon and Rectum Cancer

Bottom Line

Colorectal cancer is the third most commonly diagnosed cancer and cause of cancer-related death among both males and females in the US and Indiana. The American Cancer Society (ACS) estimated that 2,890 Indiana residents will be diagnosed with colorectal cancer and 1,080 will die because of the disease during 2015.[1] The lifetime risk of developing colorectal cancer is 1 in 22 for females and 1 in 21 for males.[1] In Indiana, African Americans have higher colorectal cancer incidence and mortality rates than whites, and males have higher rates than females.

Who Gets Colon and Rectum Cancer?

Age and sex are the two greatest risk factors for developing colorectal cancer. During 2012, 91 percent of cases diagnosed were among Indiana residents age 50 and older. In addition, during 2008-2012, colorectal cancer incidence rates were 27 percent higher among Indiana males than females (50.3 versus 39.5 cases per 100,000 people) [Figure 18].

Additional risk factors for colorectal cancer include:

- **Race.** In Indiana, during 2008–2012, African Americans had an 18 percent higher incidence rate (51.5 versus 43.7 cases per 100,000 people) and a 37 percent higher mortality rate (22.0 versus 16.1 deaths per 100,000 people) when compared with whites [Figure 18].
- **Personal or family history.** Risk is increased by having a personal or family history of colorectal cancer or polyps, a personal history of chronic inflammatory bowel disease, or certain inherited genetic conditions (*e.g.,* Lynch syndrome, also known as hereditary nonpolyposis colorectal cancer, and familial adenomatous polyposis [FAP]).[2]
- **Smoking.** According to Surgeon General's Report, *The Health Consequences of Smoking — 50 Years of Progress*, smoking is a known cause of colorectal cancer. In addition, smoking increases the failure rates of treatment for all cancers.
- **Diabetes.** Studies have found that individuals with type 2 diabetes are at higher risk.[2] Although diabetes and colorectal cancer share similar risk factors, this increased risk remains even after those are taken into consideration.[2] Studies also suggest that the relationship may be stronger in males than in females. In addition, some research indicates that some diabetic medications independently affect colorectal cancer risk. In general, colorectal cancer patients with diabetes appear to have slightly poorer survival rates than non-diabetic patients.[2]
- **Modifiable risk factors.** Overweight and obesity, physical inactivity, a diet high in red or processed meat, and alcohol consumption have been found to increase colorectal cancer risk.[2] There are some factors that may help lower risk or even prevent colorectal cancer. Moderate daily fruit and vegetable intake has been shown to decrease risk. In addition, consumption of dairy products and higher blood levels of vitamin D appear to decrease risk.[2] Intake of dietary folate, dietary fiber, cereal fiber, and whole grains is associated with reduced risk; specifically, for every 10 grams of daily fiber consumption there is a 10 percent reduction in cancer risk.[2] Some studies suggest that long-term, regular use of non-steroidal anti-inflammatory drugs (such as aspirin), and use of postmenopausal hormones may reduce risk; however, these drugs and therapies are not recommended for the prevention of colorectal cancer because they can have serious adverse health effects.[2]

Can Colon and Rectum Cancer Be Detected Early? — *see the "Be Aware" box for additional information*

Colorectal cancer incidence rates increased from 1975 through the mid-1980s, but have been decreasing for the past two decades in the US.[2] Declines have accelerated during the past few years. From 2008 to 2010, incidence rates decreased by more than four percent per year in both males and females.[2] These declines are largely attributed to increases in the use of colorectal cancer screening tests that allow the detection and removal of colorectal polyps before they progress to cancer.[2] A similar trend has been seen in Indiana [Figure 19].

Symptoms of advanced disease include rectal bleeding, blood in the stool, a change in bowel habits, and cramping pain in the lower abdomen. In some cases, blood loss from cancer leads to anemia (low red blood cells), causing symptoms such as weakness and fatigue.

Beginning at age 50, both males and females with average risk for colorectal cancer should follow one of these testing schedules:

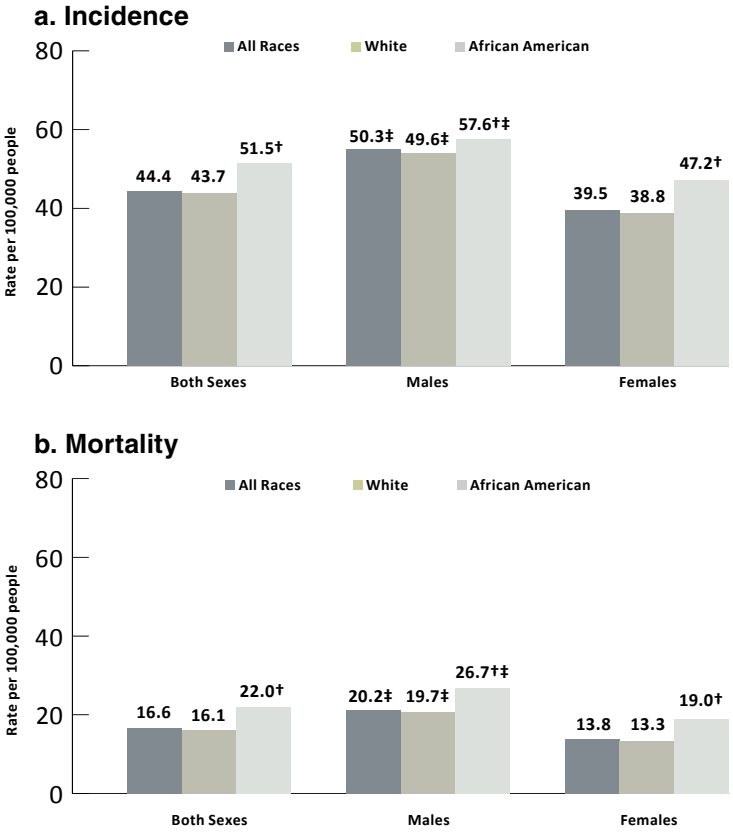
- Tests that find polyps and cancer:
  - Colonoscopy every ten years; or
  - Flexible sigmoidoscopy, double-contrast barium enema, or computed tomography (CT) colonography (also referred to as a "virtual colonoscopy") every five years. If any of these three tests are positive, a colonoscopy should be done.

BE AWARE!

Common Signs and Symptoms of Colorectal Cancer

- Early Stage: No symptoms
- Late Stage:
  - Rectal bleeding
  - Blood in stool
  - Change in bowel habits
  - Cramping pain in lower abdomen
  - Weakness
  - Extreme fatigue

Figure 18. Colorectal Cancer Incidence (a) and Mortality (Death) (b) Rates by Sex and Race* — Indiana, 2008–2012



** Age-adjusted*

† Rate among African Americans is significantly higher (P<.05) than rate among whites

‡ Rate among males is significantly higher (P<.05) than rate among females

Source: Indiana State Cancer Registry

TAKE CHARGE!

What You Can Do to Help Prevent Colorectal Cancer

- Get screened regularly
- Maintain a healthy weight
- Adopt a physically active lifestyle
- Avoid tobacco products
- Limit consumption of alcohol
- Consume a healthy diet that:
  - Emphasizes plant sources
  - Supports a healthy weight
  - Includes at least 2 ½ cups of a variety of vegetables and fruits each day
  - Includes whole grains rather than processed (refined) grains
  - Limits processed and red meats
- Tests that primarily find cancer
  - Yearly fecal occult blood test (FOBT) or fecal immunochemical test (FIT) or a stool DNA test (undetermined interval). If any of these three tests are positive, a colonoscopy should be done.
- Individuals who have an increased risk should talk to their health care provider about whether they should be screened at a younger age, more frequently, or with colonoscopy.

In recent years, colorectal cancer incidence rates have increased among younger adults in the US. Therefore, timely evaluation of symptoms consistent with colorectal cancer in adults under age 50 is important.

What Factors Influence Colorectal Cancer Survival?

Nationally, mortality rates for colorectal cancer have declined in both males and females over the past two decades.[2] In Indiana, mortality rates decreased 31 percent from 2002 to 2012 (from 21.3 to 16.6 deaths per 100,000 people) [Figure 19]. This included a 32 percent decrease among both males (from 25.9 to 19.7 deaths per 100,000) and females (from 17.9 to 13.6 deaths per 100,000).

In the US, the five- and ten-year relative survival rates for people with colorectal cancer are 65 percent and 58 percent, respectively.[2] When colorectal cancers are detected early, at the local stage, the five-year survival rate is 90 percent. In Indiana, during 2008–2012, 44.2 percent of colorectal cancers were identified early, in the in situ or local stage [Figure 20]. If the cancer has spread regionally beyond the colon or rectum, the five-year survival rate decreases to 70 percent. The five-year survival rate for colorectal cancer that is diagnosed late, or in the distant stage, is 13 percent.

Surgery is the most common treatment for colorectal cancer. Chemotherapy alone, or in combination with radiation, is given before or after surgery to patients whose cancer has deeply penetrated the bowel wall or spread to lymph nodes. Three targeted monoclonal antibody therapies, which block growth of blood vessels to the tumor or the effects of hormone-like factors that promote cancer cell growth, are approved to treat metastatic colorectal cancer.

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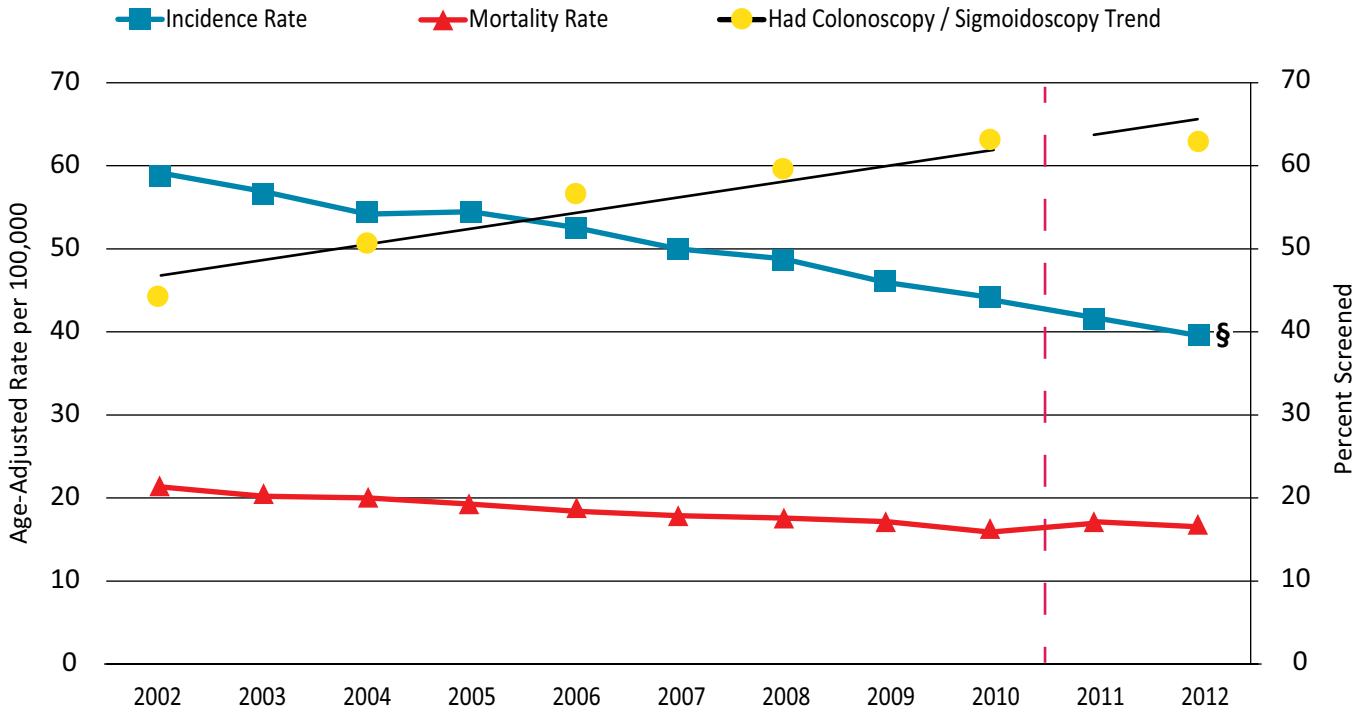
Figure 19. Trends in Colorectal Cancer Incidence* and Screening Rates† — Indiana, 2002–2012



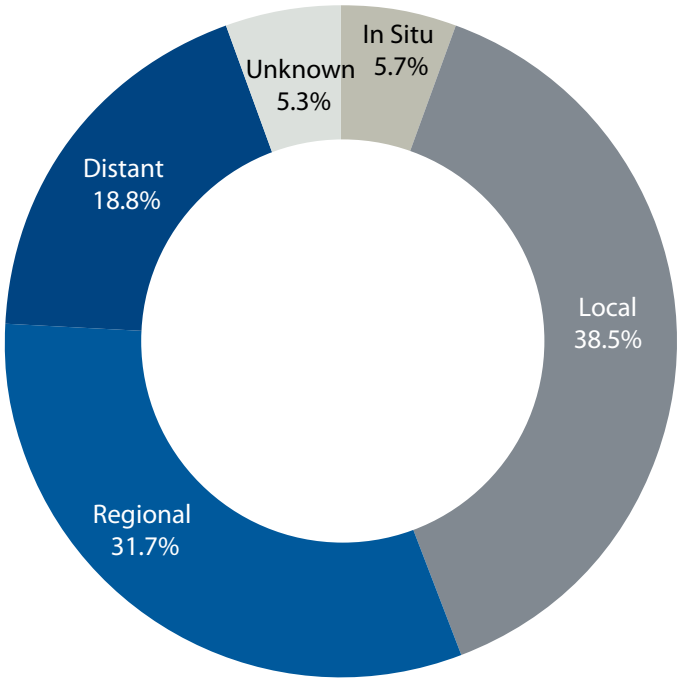
** Incidence rates are age-adjusted.*

† Persons ages 50 and older who have ever had a sigmoidoscopy or colonoscopy. Starting in 2002, these data have been collected every two years. A trend line is provided. Beginning in 2011, the BRFSS methodology changed with the inclusion of cell phone respondents and a new weighting procedure; thus, 2011 and forward are not directly comparable to previous years.

§ Incidence rate in 2012 is significantly lower (P<.05) than the rate in 2002

Sources: Indiana State Cancer Registry (Incidence data); Indiana Behavioral Risk Factor Surveillance System (Screening data)

Figure 20. Percent of Colon and Rectum Cancer Cases Diagnosed During Each Stage* — Indiana, 2008–2012



During 2008–2012, of the 16,419 Indiana residents who were diagnosed with colorectal cancer, 7,251 (44.2%) were diagnosed in the in situ or local stage, 8,290 (50.5%) were diagnosed in the regional or distant stages, and 878 (5.3%) had unknown staging.

** Includes all in situ and invasive cases*

Source: Indiana State Cancer Registry

What is the Impact on Indiana Residents?

Table 9. Burden of Invasive Lung Cancer — Indiana, 2008–2012

	Average number of cases per year (2008–2012)	Rate per 100,000 people* (2008–2012)	Number of cases (2012)	Rate per 100,000 people* (2012)
Indiana Incidence	5,167	73.9	4,674	65.4
Indiana Mortality	4,006	57.5	3,958	55.7

** Age-adjusted*

Source: Indiana State Cancer Registry

Bottom Line

Lung cancer is the leading cause of cancer deaths in the US and Indiana, killing over 158,000 Americans and approximately 4,000 Indiana residents each year. The American Cancer Society (ACS) estimated that 5,510 Indiana residents will be diagnosed with lung and bronchus cancer and 4,060 are expected to die because of the disease during 2015.[1] If all tobacco smoking were stopped, the occurrence of lung cancer would decrease by an estimated 90 percent[2]; however, in Indiana, 21.9 percent of adults continue to smoke tobacco, placing them at great risk for developing lung and other types of cancer.[3]

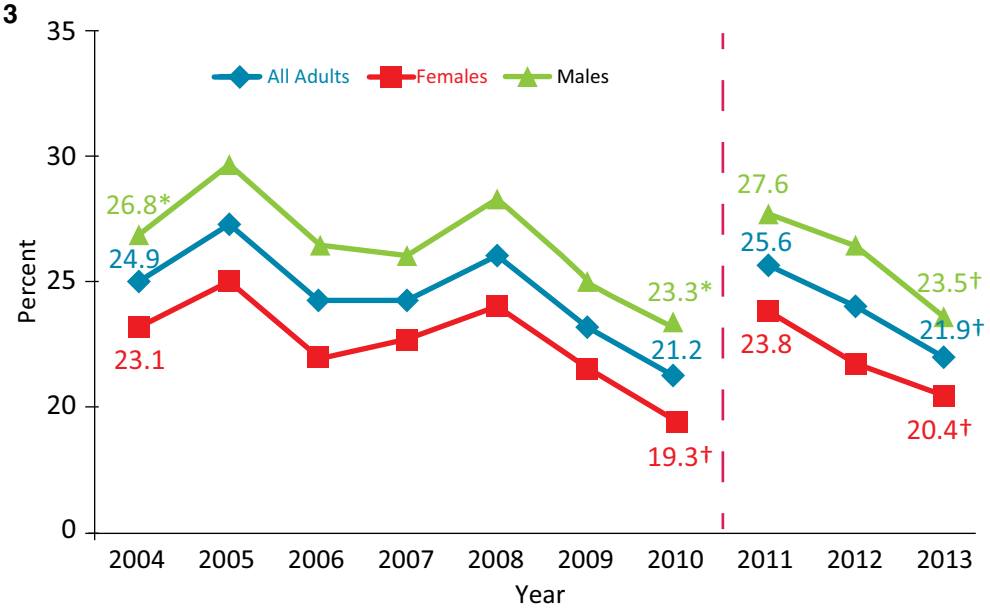
Who Most Often Gets Lung Cancer?

- **Smokers.** Smoking accounts for 87 percent of lung cancer deaths and at least 30 percent of all cancer deaths. Lung cancer mortality rates are about 23 times higher for current male smokers and 13 times higher for current female smokers when compared to people who have never smoked.[4] Over one million (21.9 percent) adults in Indiana are current smokers, and Indiana's adult smoking rate remains among the highest in the nation (median adult smoking rate in the US was 19 percent in 2013).[5]
- **Individuals exposed to secondhand smoke.** Each year, an estimated 50,000 American and 1,240 Indiana resident nonsmokers die from exposure to secondhand smoke (smoke breathed in involuntarily by someone who is not smoking).[4]
- **Individuals exposed to other cancer-causing agents.** Exposure to asbestos, radon, arsenic, talc, vinyl chloride, coal products, and radioactive ores, like uranium, can increase risk for developing lung cancer, especially if they also smoke tobacco. Radon is a naturally occurring gas that comes from rocks and dirt and can get trapped in houses and buildings. It cannot be detected by smell, taste, or sight. The Environmental Protection Agency reports radon as the cause of 20,000 cases of lung cancer each year, making it the second leading cause of lung cancer behind smoking.[9]
- **Males, especially African American males.** During 2008–2012, Indiana males, compared to females, had a 50 percent greater lung cancer incidence rate (91.3 versus 61.0 cases per 100,000 people, respectively) and a 69 percent greater mortality rate (75.1 versus 44.5 deaths per 100,000 people, respectively). This is mainly because a higher percentage of males have been smokers compared to females. In 2013, 23.5 percent of adult males and 20.4 percent of adult females reported being current smokers [Figure 21].[3] African American males in Indiana have approximately 17 percent greater incidence and 20 percent greater lung cancer mortality rates than do white males [Figure 22].

Can Lung Cancer Be Detected Early? — *see the "Be Aware" box for additional information*

Findings from the National Cancer Institute's National Lung Screening Trial established screening with the use of low-dose computed tomography in specific high-risk groups has been shown to be effective in reducing mortality from lung cancer. Individuals at high-risk are defined as those ages 55 to 74 who have a minimum 30 pack per year tobacco smoking history, who currently smoke, or have quit within the past 15 years.

Figure 21. Percent of Indiana Residents, Ages 18 Years and Older, who Reported Being Current Smokers — Indiana, 2004–2013



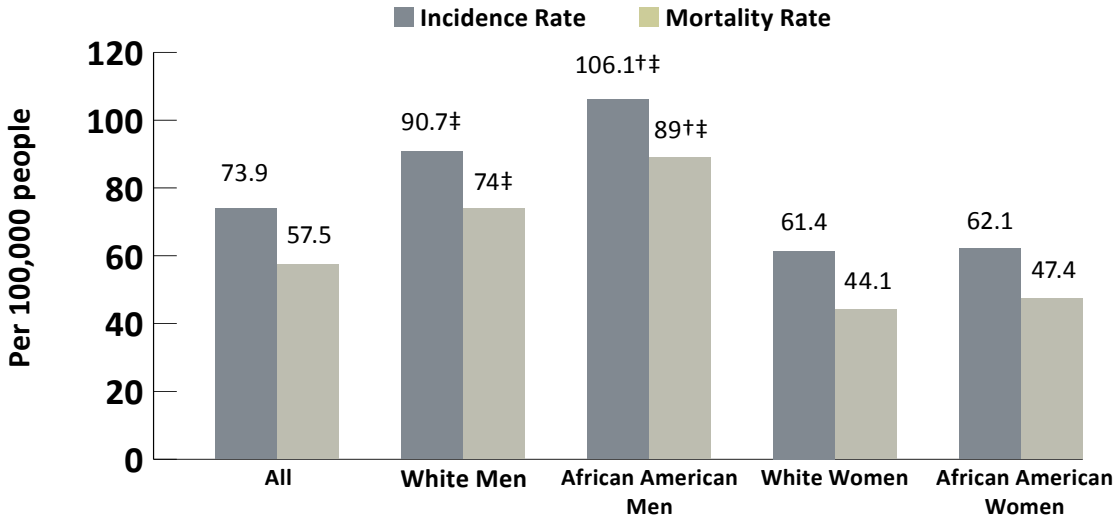
** Significantly higher (P<.05) compared to females for same year*

† Significantly lower (P<.05) compared to first year of data in trend line

Due to a change in BRFSS weighting methodology and the inclusion of cell phone individuals, results from 2011 and forward and not directly comparable with previous years.

Source: Indiana Behavior Risk Factor Surveillance System

Figure 22. Lung Cancer Incidence and Mortality (Death) Rates by Race and Sex* — Indiana, 2008–2012



** Age-adjusted*

† Significantly elevated (P<.05) compared to white males

‡ Rate among males is significantly higher (P<.05) than rate among females of the same race

Source: Indiana State Cancer Registry

What Factors Influence Lung Cancer Survival?

Lung cancer is often diagnosed at a later stage, which negatively impacts a person's odds of survival. The five-year survival rate is highest (54 percent) if the lung cancer is diagnosed when it is confined entirely within the lung (*i.e.*, localized)[6]; however, in Indiana, during 2008–2012, only 18.7 percent of lung cancers were diagnosed during this stage [Figure 23].

The one-year relative survival rate for lung cancer increased from 35 percent during 1975–1979 to 42 percent during 2002–2005, largely because of improvements in surgical techniques and combined therapies. However, the five-year survival rate for all stages combined is currently only 16 percent. The five-year survival for small cell lung cancer (6 percent) is lower than that for non-small cell lung cancer (18 percent).[7]

Treatment options are determined by the type (small cell or non-small cell) and stage of cancer, and include surgery, radiation therapy, chemotherapy, and targeted therapies such as bevacizumab (Avastin) and erlotinib (Tarceva). For localized cancers, surgery is usually the treatment of choice. Because the disease has usually spread by the time it is discovered, radiation therapy and chemotherapy are often used, sometimes in combination with surgery.

BE AWARE!

Common Signs and Symptoms of Lung Cancer

- Persistent cough
- Sputum streaked with blood
- Chest pain
- Voice changes
- Recurrent pneumonia or bronchitis
- Smokers should have an open conversation with their healthcare providers about the risks and benefits of lung cancer screening.

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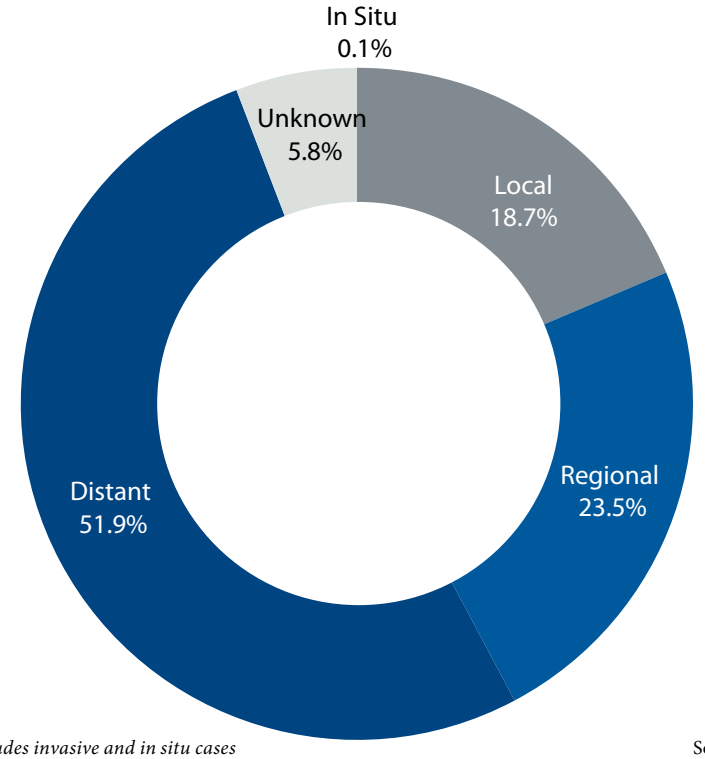
Figure 23. Percent of Lung Cancer Cases Diagnosed During Each Stage* — Indiana, 2008–2012



During 2008–2012, of the 25,859 Indiana residents who received a diagnosis of in situ or invasive lung cancer, 4,861 (18.8 percent) were diagnosed in the in situ or local stage, 19,498 (75.4 percent) were diagnosed in the regional or distant stage, and 1,500 (5.8 percent) had unknown staging.

** Includes invasive and in situ cases*

Source: Indiana State Cancer Registry

[8] Centers for Disease Control and Prevention. *The Health Consequences of Involuntary Exposure to Tobacco Smoke: A Report of the Surgeon General*. Atlanta: US Department of Health and Human Services, CDC, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2006. www.surgeongeneral.gov/library/secondhandsmoke/. Accessed Dec 21, 2011.

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TAKE CHARGE!

What You Can Do to Help Prevent Lung Cancer

- Be tobacco-free. Quitting tobacco smoking substantially decreases your risk of developing lung cancer along with ten other types of cancer, exacerbation of asthma in adults, cardiovascular disease, and chronic obstructive pulmonary disease (COPD) among many other diseases.[10] Smokers who quit, regardless of age, live longer than people who continue to smoke.[4] Visit QuitNowIndiana.com for free, evidence-based smoking cessation assistance.
- Avoid all secondhand smoke exposure.

TAKE CHARGE!

What the Community Can Do to Help Prevent Lung Cancer

- Implement comprehensive smoke-free air policies and higher taxes on tobacco products.
- Sustain tobacco control program funding to help reduce smoking rates and lessen the burden of tobacco use in Indiana. Annually, tobacco use costs the state over $2 billion in health care costs, including approximately $487 million in Medicaid payments alone.[11]
- Support the continued adoption of smoke-free workplaces. The United States Surgeon General has concluded that smoke-free workplace policies are the only effective way to eliminate exposure to secondhand smoke in the workplace and lead to less smoking among workers.[8]
- Support health care provider outreach efforts that help decrease tobacco use initiation, consumption and increase quit attempts.

What is the Impact on Indiana Residents?

Table 10. Burden of Melanoma — Indiana, 2008–2012

	Average number of cases per year (2008–2012)	Rate per 100,000 people* (2008–2012)	Number of cases (2012)	Rate per 100,000 people* (2012)
Indiana Incidence	**1,191**	**17.4**	**1,091**	**15.8**
Indiana Mortality	**214**	**3.1**	**192**	**2.7**

** Age-adjusted*

Source: Indiana State Cancer Registry

Note: The number of basal cell and squamous cell skin cancers (i.e., nonmelanoma skin cancers, or NMSC) is difficult to estimate because these cases are not required to be reported to the Indiana State Cancer Registry. According to one report, in 2006 an estimated 3.5 million cases of NMSC occurred among US residents.[2] Because of the limitations of the NMSC data, most of the data reported in this section are only for melanoma.

Melanoma/Skin Cancer

Bottom Line

Skin cancer (*i.e.*, melanoma and non-melanoma skin cancer) is an uncontrolled growth and spread of cells or lesions in the epidermis (the outer layer of skin). Excessive exposure to ultraviolet (UV) radiation from the sun or other sources, like tanning beds, is the greatest risk factor for developing skin cancer. Overall, skin cancers affect more people than lung, breast, colon, and prostate cancers combined. The two most common forms of non-melanoma skin cancers (NMSC) are basal cell and squamous cell carcinoma. Melanoma accounts for less than two percent of skin cancer cases, but causes the most skin cancer deaths.[1] Overall, the lifetime risk of getting melanoma is about one in 50 for whites, one in 1,000 for African Americans, and one in 200 for Hispanics.[2]

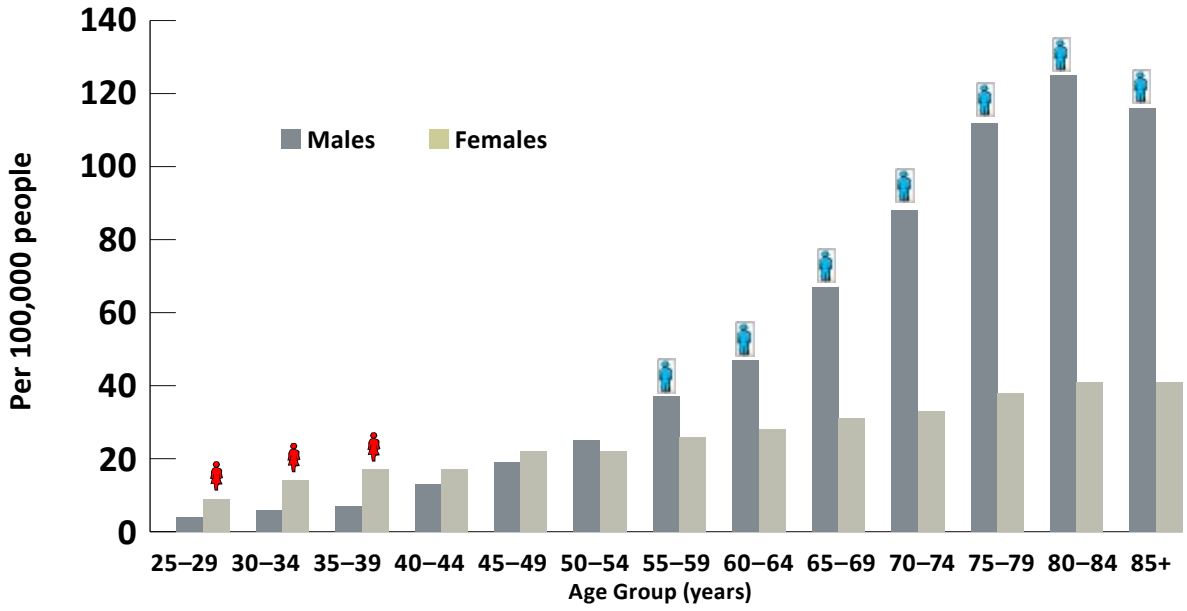
The number of non-melanoma skin cancer (*i.e.*, basal cell and squamous cell carcinoma) is difficult to estimate because these cases are not required to be reported to the Indiana State Cancer Registry. According to one report, in 2006, an estimated 3.5 million cases of NMSC occurred among US residents. Because of the limitations of the NMSC data, most of the data reported in this section are only for melanoma.

Who gets Melanoma/Skin Cancer?

People of all ages, races, and ethnicities are subject to developing skin cancer. Some risk factors include:

- **Age.** During 2008-2012, more than 74 percent of melanoma cases occurred among Indiana residents ages 50 and older [Figure 24]. However, nationally, melanoma is on the rise among younger people.[3]
- **Sex.** Overall, during 2008-2012, the incidence rate for melanoma among Indiana males was 30 percent higher than among females. However, before the age of 50, the incidence rate among females was 64 percent higher than among males. Then, among people ages 55 and older, males had more than twice the risk that females did.[3]
- **Race.** During 2008-2012, the risk of melanoma was 15 times higher for Indiana whites than for African Americans; however, anyone can develop the disease.[3]
- **Fair to light skinned complexion.** Freckles are an indicator of sun sensitivity and sun damage.
- **Hair and eye color.** People with natural blonde or red hair or blue or green eyes are more susceptible to a higher risk of developing melanoma.
- **Multiple or atypical nevi (moles).** People who have a large number of moles (more than 50) often have a higher risk of developing melanoma.
- **Family history.** The risk for developing melanoma is greater for someone who has had one or more close relatives diagnosed with the disease.
- **Excessive exposure to UV radiation from the sun and tanning beds.** The US Department of Health and Human Services and the International Agency of Research on Cancer panel has found that exposure to sunlamps or sunbeds is *known to be a human carcinogen* based on sufficient evidence of carcinogenicity from studies in humans.[4]
- **History of sunburn.** Sunburn at an early age can increase a person's risk for developing melanoma and other skin cancers.

Figure 24. Incidence of Melanoma Skin Cancer by Age Group and Sex, Indiana 2008-2012

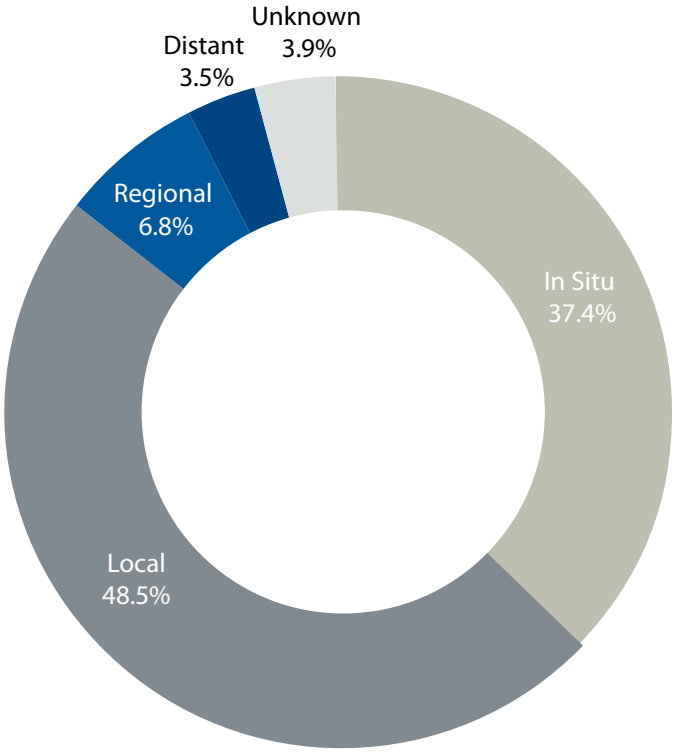


= *Significantly elevated (P<.05) among females compared to males*

= *Significantly elevated (P<.05) among males compared to females*

Source: Indiana State Cancer Registry

Figure 25. Percent of Melanoma Cases Diagnosed During Each Stage* — Indiana, 2008–2012



During 2008–2012, of the 9,506 Indiana residents who received a diagnosis of in situ or invasive melanoma, 8,166 (85.9%) were diagnosed in the in situ or local stage, 972 (10.2%) were diagnosed in the regional or distant stage, and 3.9% in the unknown stage.

** Includes invasive and in situ cases*

Source: Indiana State Cancer Registry

- **Diseases that suppress the immune system.** People who have a weakened immune system, or who are being treated with immune-suppressing medicines, have an increased risk for melanoma.[2]
- **Past history of basal cell or squamous cell skin cancers.**
- **Occupational exposure to coal tar, pitch, creosote, arsenic compounds, radium, or some pesticides.**

Can Skin Cancer be Detected Early? — *see the "Be Aware" box for additional information*

The best way to detect skin cancer early is to recognize changes in skin growths or the appearance of new growths. Adults should thoroughly examine their skin regularly, preferably once a month. New or unusual lesions or a progressive change in a lesion's appearance (size, shape, or color, for example) should be evaluated promptly by a health care provider.

Melanomas often start as small, mole-like growths that increase in size and might change color. Basal cell carcinoma might appear as growths that are flat or as small raised pink or red, translucent, shiny areas that might bleed following minor injury. Squamous cell carcinoma might appear as growing lumps, often with a rough surface, or as flat, reddish patches that grow slowly.

BE AWARE!

Common Signs and Symptoms of Melanoma

A simple **ABCDE** rule outlines some warning signs of melanoma:

A = Asymmetry: One half of the mole (or lesion) does not match the other half.

B = Border: Border irregularity; the edges are ragged, notched or blurred.

C = Color: The pigmentation is not uniform, with variable degrees of tan, brown, or black.

D = Diameter: The diameter of a mole or skin lesion is greater than 6 millimeters (or the size of a pencil eraser).

E = Evolution: When existing moles change in shape, size or color. Any sudden increase in size of an existing mole should be checked.

*Melanoma might appear differently than what is described in the **ABCDE** rule, so discuss any changes to existing moles or new growths on the skin with your health care provider.*

What Factors Influence Survival?

Most basal and squamous cell carcinomas can be cured, especially if the cancer is detected and treated early. Early stage basal and squamous cell carcinomas can be removed in most cases by one of several methods including surgical excision, electrodesiccation, and curettage (tissue destruction by electric current and removed by scraping with a curette), or cryosurgery (tissue destruction by freezing). Radiation therapy and certain topical medications may be used in some cases.

Melanoma is also highly curable if detected in its earliest stages and treated properly. Treatment involves removing the primary growth and surrounding normal tissue. Sometimes, a sentinel lymph node is biopsied to determine stage.[1] Additional, extensive lymph node surgery may be needed if lymph node metastases are present. Treatment for advanced cases of melanoma includes palliative surgery, newer targeted or immunotherapy drugs, and sometimes chemotherapy and/or radiation therapy. The treatment of advanced melanoma has changed with the US Food and Drug Administration approval of targeted drugs such as vemurafenib (Zelboraf), dabrafenib (Tafinlar), trametinib (Mekinist), and the immunotherapy drugs ipilimumab (Yervoy) and pembrolizumab (Keytruda).[1]

Melanoma is more likely than other skin cancers to spread to other parts of the body (*i.e.* legs, pelvis, spine, bones, liver, and brain). The five-year survival rate for people with melanoma is 91 percent. For localized melanoma (48.5 percent of cases diagnosed in Indiana), the five-year survival rate is 98 percent. When melanoma is spread regionally (6.8 percent of cases diagnosed in Indiana), the five-year survival rate is 62 percent. In Indiana, during 2008-2012, 3.5 percent of cases were diagnosed in the distant stage. For those diagnosed during this stage, the five-year survival rate declines to just 16 percent.

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TAKE CHARGE!

What You Can Do to Help Prevent Skin Cancer

- Limit or avoid exposure to the sun during peak hours (10 a.m. to 4 p.m.).
- Wear sunscreen with a Sun Protection Factor (SPF) of 30 or higher that protects you from both UVA and UVB rays. These are called "broad spectrum" sunscreens.
- Wear clothing that has built-in SPF in the fabric or wear protective clothing such as long sleeves and long pants (tightly woven dark fabrics protect your skin better than lightly colored, loosely woven fabrics).
- Wear a hat that protects your scalp and shades your face, neck, and ears.
- Avoid use of tanning beds and sun lamps.
- Wear sunglasses to protect your eyes from ocular melanoma (melanoma of the eye).
- ALWAYS protect your skin. Your skin is still exposed to UV rays on cloudy days and during the winter months. Use extra caution around water, snow, and sand as they reflect the sun's ultraviolet rays.

What is the Impact on Indiana Residents?

Table 11. Burden of Invasive Prostate Cancer — Indiana, 2008–2012

	Average number of cases per year (2008–2012)	Rate per 100,000 people* (2008–2012)	Number of cases (2012)	Rate per 100,000 people* (2012)
Indiana Incidence	3,529	106.9	2,844	82.6
Indiana Mortality	584	21.9	606	21.9

** Age-adjusted*

Source: Indiana State Cancer Registry

Prostate Cancer

Bottom Line

The prostate is an exocrine gland in the male reproductive system. Excluding all types of skin cancer, prostate cancer is the most commonly diagnosed cancer, and the second leading cause of cancer death among males in the US and Indiana.[1] Approximately one in six males in the US will be diagnosed with prostate cancer and one in 36 will die from it during their lifetime.

Who Gets Prostate Cancer Most Often?

- **Older males.** The chance of developing prostate cancer rises rapidly after age 50, with two out of three new diagnoses occurring among males over age 65.[7] About 60 percent of all prostate cancer cases are diagnosed in males ages 65 and older, and 97 percent occur in males 50 and older.[1]
- **African American Males.** African American males are more likely to develop prostate cancer (one in five lifetime incidence) [Table 12] than whites, and the mortality rate for African American males is twice as high as white males.[7] However, in Indiana, this disparity between African American and white males appears to be decreasing [Figure 26].
- **Males with a family history of prostate cancer.** Males with one first-degree relative (a father, brother, or son) with a history of prostate cancer are two to three times more likely to develop the disease.[2] This risk increases if more family members are diagnosed with prostate cancer.

Can Prostate Cancer Be Detected Early?

— see the "Be Aware" box for additional information

Not all medical experts agree that screening for prostate cancer will save lives. The controversy focuses on cost of screening, the age groups to be screened, and the potential for serious side effects associated with treatment after diagnosis. Not all forms of prostate cancer need treatment.

The American Cancer Society recommends that beginning at the age of 50, males who are at average risk of prostate cancer and have a life expectancy of at least 10 years have a conversation with their health care provider about the benefits and limitations of prostate-specific antigen (PSA) testing. Males should have an opportunity to make an informed decision about whether or not to be tested based on their personal values and preferences. Males at high risk of developing prostate cancer, (African Americans or males with a close relative diagnosed with prostate cancer before the age of 65), should have this discussion with their health care provider beginning at 45. Males at even higher risk (because they have several close relatives diagnosed with prostate cancer at an early age) should have this discussion with their provider at 40.[1]

- Potential benefits of prostate cancer screening include:
  - Early detection
  - Increased treatment effectiveness
- Potential risks of prostate cancer screening include:
  - False-positive test results (indicating that you have prostate cancer when you do not) — potentially leading to unneeded testing and can cause anxiety.
  - Over-diagnosis — since prostate cancer may not grow or cause symptoms. Typical growth is slow and may not cause health problems.
  - Over-treatment of some prostate cancers that might not affect a man's health if left untreated. Also, treatment might lead to serious side effects such as impotence (inability to keep an erection) and incontinence (inability to control the flow of urine, resulting in leakage).[8]
- Given the potential risks linked to prostate cancer screening, it is vital for males to talk with their health care provider to become informed decision makers. Each man should:
  - Understand his risk of prostate cancer.
  - Understand the risks, benefits, and alternatives to screening.
  - Participate in the decision to be screened or not at a level he desires.
  - Makes a decision consistent with his preferences and values.
- Tests commonly used to screen for prostate cancer include:
  - **Digital rectal exam (DRE).** A doctor or nurse inserts a gloved, lubricated finger into the rectum to feel the prostate. This allows the examiner to estimate the size of the prostate and feel for any lumps or other abnormalities.
  - **PSA test.** This is a blood test that measures levels of PSA, a substance made by the prostate. While high PSA levels may indicate the presence of prostate cancer, it may also indicate other noncancerous conditions.
  - If PSA or DRE tests are abnormal, doctors may perform additional tests, including use of transrectal ultrasounds and biopsies.

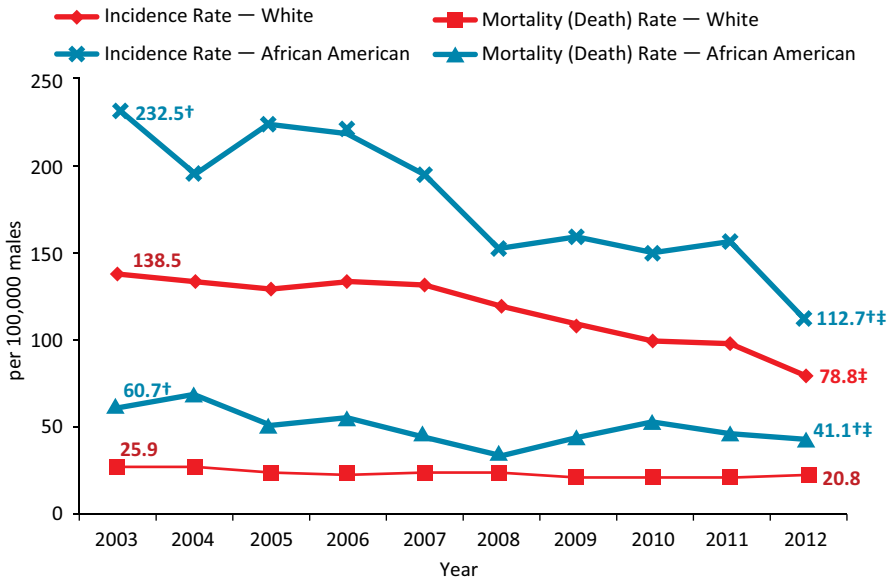
Table 12. Probability of Developing Prostate Cancer Over Selected Age Intervals by Race — US, 2009–2011*

Age	White		African American	
30 to 39	0.01	(1 in 12,288)	0.03	(1 in 4,000)
40 to 49	0.29	(1 in 390)	0.73	(1 in 138)
50 to 59	2.11	(1 in 47)	3.92	(1 in 25)
60 to 69	5.96	(1 in 16)	9.51	(1 in 10)
70 to 79	7.04	(1 in 14)	10.30	(1 in 9)
Lifetime risk	14.16	(1 in 7)	19.08	(1 in 5)

** For people free of cancer at beginning of age interval. Percentages and "1 in" numbers might not be equivalent because of rounding.*

Source: DevCan: Probability of Developing or Dying of Cancer Software, Version 6.8.0. Statistical Research and Applications Branch, National Cancer Institute, August 2014. http://surveillance.cancer.gov/devcan/).

Figure 26. Prostate Cancer Incidence and Mortality (Death) Rates by Race* — Indiana, 2003–2012



** Age-adjusted*

† Significantly elevated (P<.05) compared to white males

‡ Significantly lower (P<.05) compared to 2003

Source: Indiana State Cancer Registry

What Factors Influence Prostate Cancer Survival?

- **Stage of diagnosis.** After prostate cancer has been diagnosed, tests are performed to determine whether the cancer cells remain within the prostate or have spread to other parts of the body [Figure 27]. The grade assigned to the tumor, typically called the Gleason score, indicates the likely aggressiveness of the cancer.
- **Treatment options** vary depending on age, stage, and grade of cancer. The most common treatments for localized prostate cancer (confined to the prostate) include:
  - ***Active surveillance (watchful waiting).*** The patient's prostate cancer is closely monitored by performing the PSA and DRE tests regularly. Treatment occurs only if and when the prostate cancer causes symptoms or shows signs of growing. This can be more appropriate for males with less aggressive tumors and older males.
  - ***Surgery (radical prostatectomy).*** Prostatectomy is surgery to remove the prostate completely. Radical prostatectomy removes the prostate as well as the surrounding tissue.
  - ***Radiation therapy.*** Radiation destroys cancer cells, or prevents them from growing, by directing high-energy X-rays (radiation) at the prostate. There are two types of radiation therapy:
    - ***External radiation therapy.*** A machine outside the body directs radiation at the cancer cells.
    - ***Internal radiation therapy (brachytherapy).*** Radioactive seeds or pellets are surgically placed into or near the cancer to destroy the cancer cells.
  - ***Hormone therapy.*** This treatment, called androgen deprivation therapy (ADT), alters the effects of male hormones on the prostate through medical or surgical castration (elimination of testicular function) or administration of antiandrogen medications.
  - ***Cyrotherapy.*** This treatment involves the controlled freezing of the prostate gland in order to destroy cancerous cells.[5]

BE AWARE!

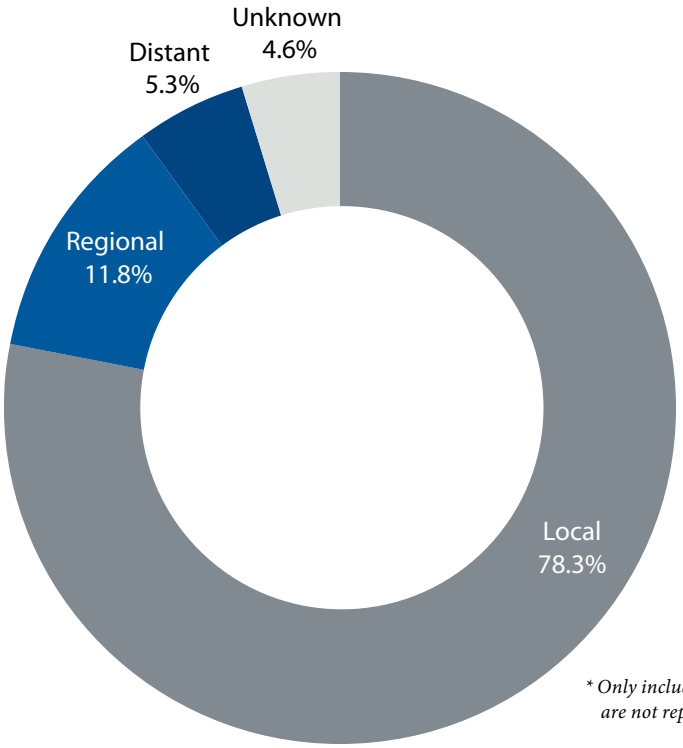
Common Signs and Symptoms of Prostate Cancer

- In early stages, prostate cancer may not cause symptoms. It is important to know that some males have no symptoms at all. [1,5]
- Symptoms* of prostate cancer can include:
  - Difficulty starting urination
  - Weak or interrupted flow of urine
  - Frequent urination, especially at night
  - Inability to empty the bladder completely
  - Pain or burning during urination
  - Blood in the urine or semen
  - Painful ejaculation
  - Trouble having an erection
  - Pain in the back, hips, or pelvis that doesn't go away**

**These symptoms also occur frequently as a result of non-cancerous conditions, such as prostate enlargement or infection and none are specific for prostate cancer*

***This symptom is most associated with advanced prostate cancer since it commonly spreads to the bones.*

Figure 27. Percent of Prostate Cases Diagnosed During Each Stage* — Indiana, 2008–2012



During 2008–2012, of the 17,643 Indiana residents who received an invasive prostate cancer diagnosis, 13,819 (78.3%) were diagnosed in the local stage, 2,090 (11.8%) were diagnosed in the regional stage, 928 were diagnosed in the distant stage (5.3%), and 806 (4.6%) had unknown staging.

** Only includes invasive cases; in situ cases are not reportable*

Source: Indiana State Cancer Registry

- **Overall survival.** The majority (93 percent) of prostate cancers are discovered in the local or regional stages.[1] In the US, the five-year relative survival rate for prostate cancer among African Americans is 96 percent and nearly 100 percent among whites.[2] Obesity and smoking are associated with an increased risk of dying from prostate cancer.[1]

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TAKE CHARGE!

What You Can Do to Help Prevent Prostate Cancer

- Stay active, eat well, and maintain a healthy body weight. In particular:
  - Eat at least five servings of fruits and vegetables each day.
  - Limit intake of red meats (especially processed meats such as hot dogs, bologna, and lunch meat).
  - Avoid excessive consumption of dairy products (>3 servings/day) and calcium (>1,500 mg/day).
  - Include recommended levels of lycopene (antioxidants that help prevent damage to DNA which are found in tomatoes, pink grapefruit, and watermelon) and vitamin E in your diet.
  - Meet recommended levels of physical activity. (http://www.cdc.gov/physicalactivity/everyone/guidelines/index.html)[6]

What is the Impact of Cancer on African Americans in Indiana?

Table 13. Burden of Cancer among African Americans — Indiana, 2008–2012

	Average number of cases per year (2008–2012)	Rate per 100,000 people* (2008–2012)	Number of cases (2012)	Rate per 100,000 people* (2012)
Indiana Incidence	2,338	479.6	2,181	430.8
Indiana Mortality	995	221.2	1,063	228.6

** Age-adjusted*

Source: Indiana State Cancer Registry

Bottom Line

African Americans have the highest mortality rate and shortest survival of any racial and ethnic group in the US for most cancers.[1] The causes of these inequalities are complex and are thought to reflect social and economic disparities more than biologic differences associated with race. These include inequities in work, wealth, income, education, housing, and overall standard of living, as well as barriers to high-quality cancer prevention, early detection, and treatment services.[1] In Indiana, while the overall racial disparities in cancer incidence and mortality rates have been gradually decreasing, during 2008–2012 African Americans still had almost a four percent greater incidence of cancer than whites, and over a 21 percent higher mortality rate.

What Types of Cancer Impact the African American Community the Most?

Table 14 provides an overview of the leading types of cancer that impacted African Americans in Indiana during 2012. Prostate cancer was the most common cancer diagnosed in African American males. Breast cancer was the most common cancer diagnosed in African American females. The leading cause of cancer death among males and females was lung cancer. Colorectal cancer was the third leading cause of cancer deaths among males and third leading cause of cancer death for females. Breast cancer was the second leading cause of cancer death for females.

Table 14. Leading Sites of New Cancer Cases and Deaths among African Americans by Sex — Indiana, 2012

Number (%) of New Cases

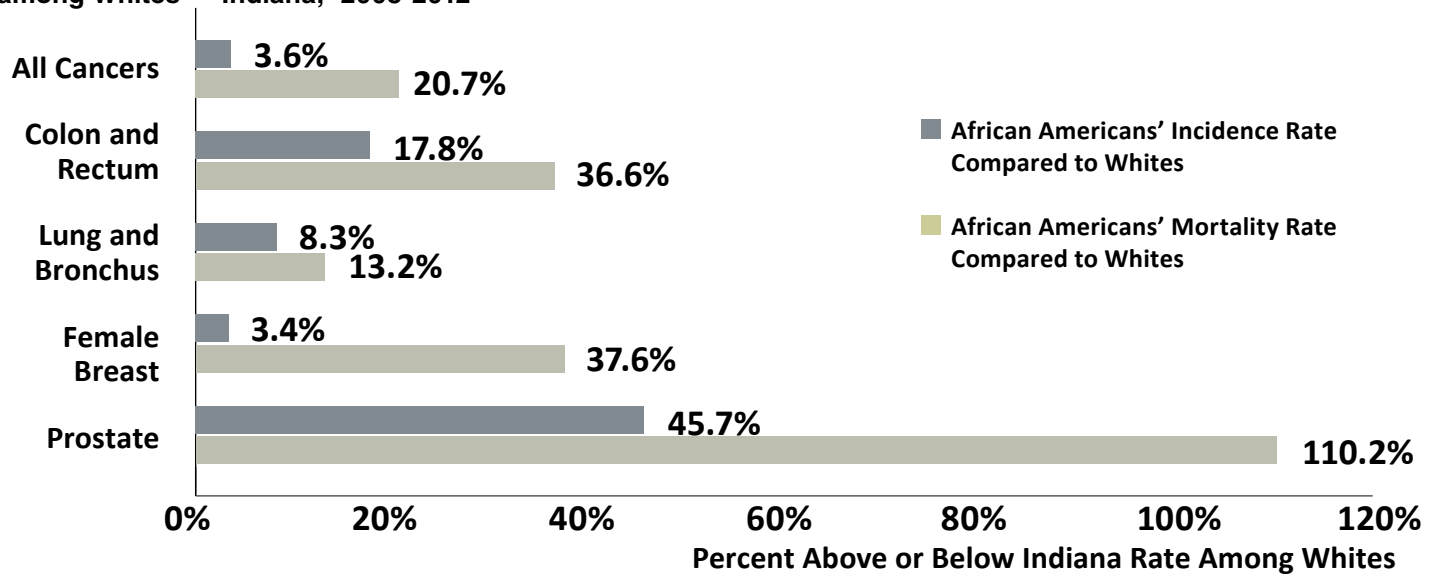
Male	Count	%	Female	Count	%
Prostate	257	26.1%	Breast	359	30.0%
Lung and Bronchus	171	17.3%	Lung and Bronchus	148	12.4%
Colon and Rectum	94	9.5%	Colon and Rectum	117	9.8%
Kidney and Renal Pelvis	59	6.0%	Pancreas	42	3.5%
Urinary Bladder	34	3.4%	Non-Hodgkin Lymphoma	41	3.4%
Pancreas	30	3.0%	Thyroid	29	2.4%
Non-Hodgkin Lymphoma	29	2.9%	Kidney and Renal Pelvis	28	2.3%
Oral Cavity and Pharynx	27	2.7%	Cervix Uteri	23	1.9%
Leukemia	20	2.0%	Ovary	20	1.7%
Melanoma of the Skin	2	0.2%	Melanoma of the Skin	4	0.3%
All Sites	**986**		**All Sites**	**1,195**	

Number (%) of Deaths

Male	Count	%	Female	Count	%
Lung and Bronchus	158	29.9%	Lung and Bronchus	148	27.7%
Prostate	65	12.3%	Breast	98	18.4%
Colon and Rectum	53	10.0%	Colon and Rectum	56	10.5%
Pancreas	34	6.4%	Pancreas	36	6.7%
Liver	30	5.7%	Ovary	21	3.9%
Leukemia	18	3.4%	Leukemia	16	3.0%
Kidney and Renal Pelvis	12	2.3%	Non-Hodgkin Lymphoma	13	2.4%
Non-Hodgkin Lymphoma	9	1.7%	Cervix Uteri	11	2.1%
Urinary Bladder	7	1.3%	Kidney and Renal Pelvis	7	1.3%
Oral Cavity and Pharynx	7	1.3%	Urinary Bladder	6	1.1%
All Sites	**529**		**All Sites**	**534**	

Source: Indiana State Cancer Registry

Figure 28. Comparison of Cancer Incidence and Mortality (Death) Rates among African American to those among Whites — Indiana,* 2008-2012



** Age-adjusted incidence and mortality rates are significantly elevated (P<.05) among African Americans compared to whites for all cancer types except for female breast cancer incidence*

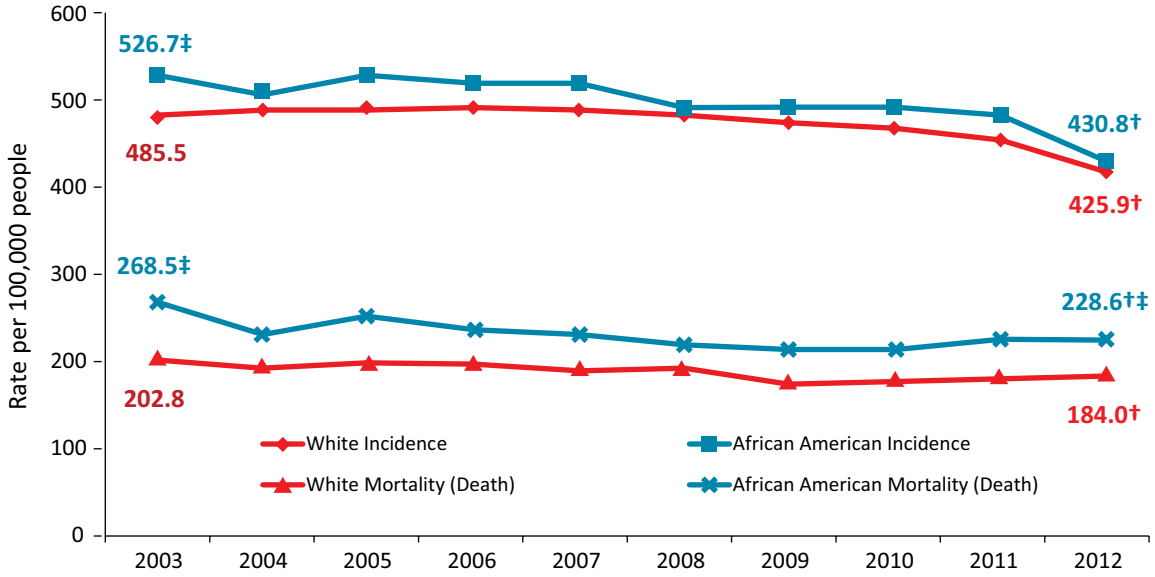
Source: Indiana State Cancer Registry

What are the Cancer Disparities in Indiana Relating to Race?

While African Americans, compared to whites, continue to be unequally burdened by cancer in Indiana [Figure 28], the disparities between the two groups have been gradually decreasing [Figure 29]. Despite these gains, continued work needs to be done to address the differences among the races, especially the difference in cancer mortality rates. Some additional information about the impact of specific cancer types among African Americans during 2008-2012 is provided below.

- **Colon and Rectum Cancer.** In comparison to whites, African Americans had an 18 percent higher incidence rate (51.5 versus 43.7 cases per 100,000 people, respectively) and a 37 percent higher mortality rate for colon and rectum cancer (22.0 versus 16.1 deaths per 100,000 people, respectively). African American males, in particular, were at greater risk, as their age-adjusted incidence rate was 16 percent greater than white males (57.6 versus 49.6 cases per 100,000 males, respectively) and their mortality rate was 36 percent higher (26.7 versus 19.7 deaths per 100,000 males, respectively). African American females had similar rates to white males, but, compared to white females, they had a 22 percent greater incidence rate (47.2 versus 38.8 cases per 100,000 females, respectively) and a 43 percent greater mortality rate (19.0 versus 13.3 deaths per 100,000 females, respectively).
- **Lung Cancer.** In comparison to whites, African Americans had an eight percent higher incidence rate (80.0 versus 73.9 cases per 100,000 people, respectively) and a 13 percent higher mortality rate (64.3 versus 56.8 deaths per 100,000 persons, respectively). Additionally, the age-adjusted mortality rate for lung cancer was nearly two times greater for African American males compared to African American females (89.0 versus 47.4 deaths per 100,000 females, respectively).
- **Prostate Cancer.** The age-adjusted incidence rate for prostate cancer was 46 percent higher among African American males compared to white males (146.3 versus 100.4 cases per 100,000 males, respectively). Moreover, the death rate for prostate cancer was more than two times greater (43.1 versus 20.5 deaths per 100,000 males, respectively).
- **Breast Cancer.** African American females had similar incidence rates to white females for breast cancer (122.0 versus 118.0 cases per 100,000 females, respectively). However, the mortality rate for African American females was 38 percent high than the rate for white females (30.0 versus 21.8 deaths per 100,000 females, respectively). Breast cancers diagnosed in African American females are more likely to have factors associated with poor prognosis (*i.e.*, higher grade, advanced stage, and negative hormone estrogen[ER] and progesterone [PR]) receptor status) than those diagnosed in white females. Studies have shown that certain reproductive patterns that are more common among African American females (*i.e.*, giving birth to more than one child, younger age at menarche, early age at first pregnancy), may be associated with increased risk for aggressive subtypes of breast cancer.[1]

Figure 29. Cancer Incidence and Mortality (Death) Rates by Race* — Indiana, 2003-2012



** Age-adjusted*

† Rate is significantly lower than in 2003

‡ African American rate is significantly higher (P<.05) than the white rate

Source: Indiana State Cancer Registry

Can Cancer Be Prevented? — *see the "Take Charge" box for additional information*

Figure 30 describes the burden of some lifestyle and external factors among African American adults in Indiana. Additional information about the impact of cancer risk factors on African Americans in Indiana is provided below.

- **Body Weight, Diet, and Physical Activity.** Scientific evidence suggests that nationally about one-third of cancer deaths are related to overweight or obesity, physical inactivity, and poor nutrition, and thus could be prevented.[2] In particular, being obese has been linked with increased risk for developing cancers of the breast (in postmenopausal females), colon, endometrial, kidney, and esophagus. In 2013, in Indiana, African American adults were 36 percent more likely than white adults to be considered obese based on body mass index (BMI) (41.7 percent versus 30.6 percent, respectively).[3] Additionally, 58 percent of African American adults did not get their recommended 150 minutes of exercise per week, and almost 80 percent failed to eat the recommended daily servings of fruits and vegetables (*i.e.*, 2 cups of fruit and 2½ cups of vegetables per day).[3]
- **Tobacco.** Smoking is the most preventable cause of premature death in the US and is responsible for about 30 percent of all cancer deaths.[4] In 2013, 24.8 percent of African American adults were current smokers, with 26.4 percent of males and 23.4 percent of females reporting current smoking.[3]
- **Health Care Coverage.** Uninsured and underinsured patients are substantially more likely to be diagnosed with cancer at a later stage, when treatment can be more extensive and more costly.[1] In 2013, in Indiana, African American adults were 70 percent more likely than white adults to not see a doctor during the year because of cost (22.8 percent versus 13.4 percent, respectively) and African Americans, ages 18–64, were 66 percent more likely than white adults to not have any form of health care coverage (28.8 percent versus 17.3 percent, respectively).[3]

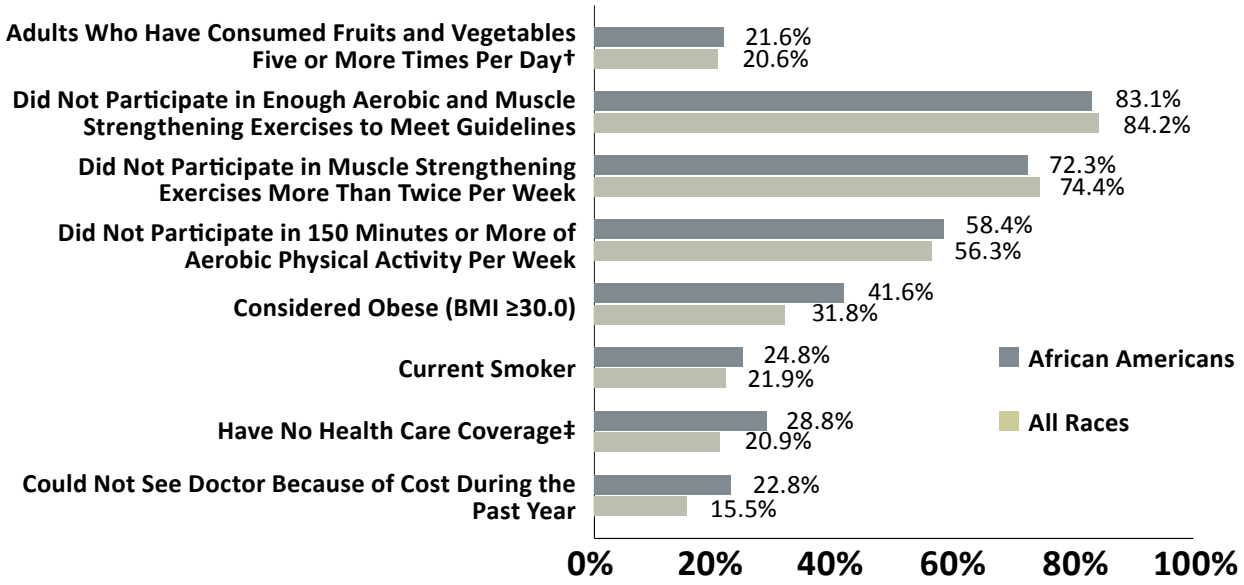
Can Cancer Be Detected Early?

Early detection tests can lead to the prevention of cancer through the identification and removal of precancerous lesions, particularly for cancers of the cervix and colon and rectum. Screening can detect cancer at an earlier stage, which can reduce the extent of treatment, improve the chances of cure, extend life, and thereby improve the quality of life for cancer survivors. In general, race did not play a role in cancer screening rates among Indiana adults during 2012 [Figure 31].

What Factors Influence Cancer Survival?

Despite having similar screening rates, African Americans are less likely than whites to survive five years at each stage of diagnosis [Figure 32] for most cancer types.[2] Based on data from the Surveillance, Epidemiology, and End Results (SEER) Program's nine population-based cancer registries the five-year survival rate for all cancer sites for whites was 69.7 percent compared to 60.7 percent for African Americans during 1973-2011.[5] Much of the difference in survival is believed to be because of barriers that prevent timely and high-quality medical care, including delayed diagnoses after screenings, greater frequency of having later stage diagnoses, and disparities in treatment.

Figure 30. Preventative Cancer Behaviors and Access to Medical Care among African American Adults* — Indiana, 2013



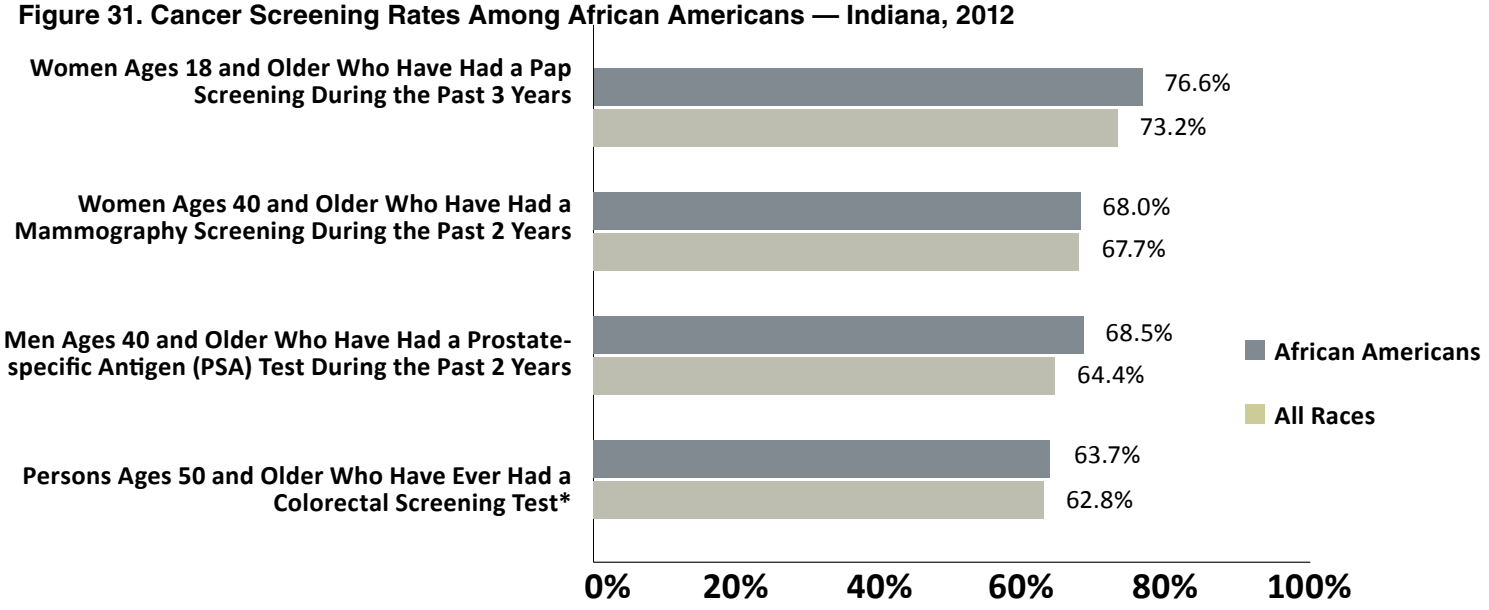
** Adults are people ages 18 and older*

† Data from 2009

‡ Adults ages 18–64

Source: Indiana Behavioral Risk Factor Surveillance System

Figure 31. Cancer Screening Rates Among African Americans — Indiana, 2012



** Sigmoidoscopy or colonoscopy*

Source: Indiana Behavioral Risk Factor Surveillance System

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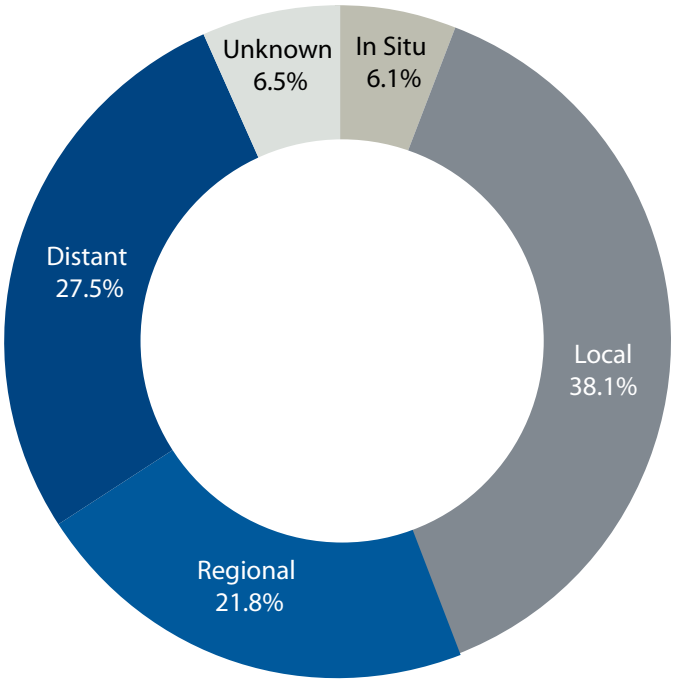
Figure 32. Percent of Cancer Cases Diagnosed among African Americans During Each Stage* — Indiana, 2008-2012



During 2008–2012, of the 11,808 African-American Indiana residents who received a diagnosis of in situ or invasive cancer, 5,218 (44.2 percent) were diagnosed in the in situ or local stage, 5,822 (49.3 percent) were diagnosed in the regional or distant stage, and 768 (6.5 percent) had unknown staging.

** Includes all in situ and invasive cancers except for basal and squamous cell skin cancers and in situ bladder, cervical, and prostate cancers, which are not reportable*

Source: Indiana State Cancer Registry

TAKE CHARGE!

What You Can Do to Help Prevent Cancer and Improve Care Among African Americans:

- Maintain a healthy body weight.
- Increase physical activity levels.
- Eat the recommended daily servings of fruits and vegetables.
- Be smoke-free — Visit www.in.gov/quitline for free smoking cessation assistance.
- Identify a primary health care provider and regularly talk about your cancer screening options.
- Talk to your primary health care provider regularly about your cancer screening options.
- Seek treatment early and avoid delaying follow-up care if you are diagnosed with cancer.
- Support the development of culturally relevant resources and support programs for African Americans that focus on early detection and treatment of cancer, as well as, improved access to services.
- Encourage health care providers to be culturally competent (*i.e.*, respectful and responsive to cultural beliefs that influence the health practices of racial and ethnic minority patients).
- Work to decrease the disparities in socioeconomic factors such as employment, income, and insurance status, which influence health behaviors and outcomes.
- Health care providers are encouraged to ask African American patients about their life, encourage them to ask questions, take seriously the responsibility and respect conferred on the provider, and involve family members.

What is the Impact of Cancer on Hispanics in Indiana?

Table 15. Burden of Cancer among Hispanics — Indiana, 2007-2011

	Average number of cases per year (2007-2011)	Rate per 100,000 people* (2007-2011)	Number of cases (2011)	Rate per 100,000 people* (2011)
Indiana Incidence	554	342.3	578	315.1
Indiana Mortality	127	99.7	139	91.9

** Age-adjusted*

Source: US Cancer Statistics Working Group. US Cancer Statistics: 1999–2011 Incidence and Mortality Web-based Report. Atlanta: US Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute; 2011. Accessed at wonder.cdc.gov on February 5, 2014.

Bottom Line

Hispanics are the largest, fastest-growing, and youngest minority group in the US and the second largest minority group in Indiana. In 2013, 420,577 Indiana residents (6.4 percent) identified themselves as Hispanic or Latino; up from 3.5 percent in 2000.[1] Hispanics' median age was 24.1 years in 2013 compared to 37.3 years among all Indiana residents. Nationally, about one in two Hispanic males and one in three Hispanic females will be diagnosed with cancer during their lifetime.[2] Additionally, cancer is the leading cause of death among Hispanics in the US, accounting for 21 percent of deaths overall and 15 percent of deaths among children.[2]

Cancer Data for Hispanics in Indiana

The Indiana State Cancer Registry (ISCR) collects data on all cancer cases in Indiana to study trends of the disease and assist in the prevention of cancer and the care of patients impacted by it. There are some unique characteristics of the Hispanic population, and limitations in data collection that impact the ability to describe the burden of cancer for this group. First, while the ISCR does collect data on the ethnicity (Hispanic versus non-Hispanic) of patients, there is potential underreporting of this variable. Additionally, the rapidly changing and increasing Hispanic population tends to be younger and more mobile, thus making them less at risk for developing cancer (age-related) and more difficult to assign to a specific geographic area (mobility-related). Finally, most cancer data in Indiana and the US are reported for Hispanics as an aggregate group, which masks important differences that exist among Hispanic subpopulations according to country of origin. According to the 2013 American Community Survey, 75 percent of the Hispanic population in Indiana was born in Mexico. Because of these factors, the rates and numbers reported for Hispanics in Indiana can vary considerably year-to-year, and the burden of cancer might be slightly higher than is reported.

Table 16. Leading Sites of New Cancer Cases and Deaths among Hispanics by Sex — Indiana, 2007–2011

Number (%) of New Cases

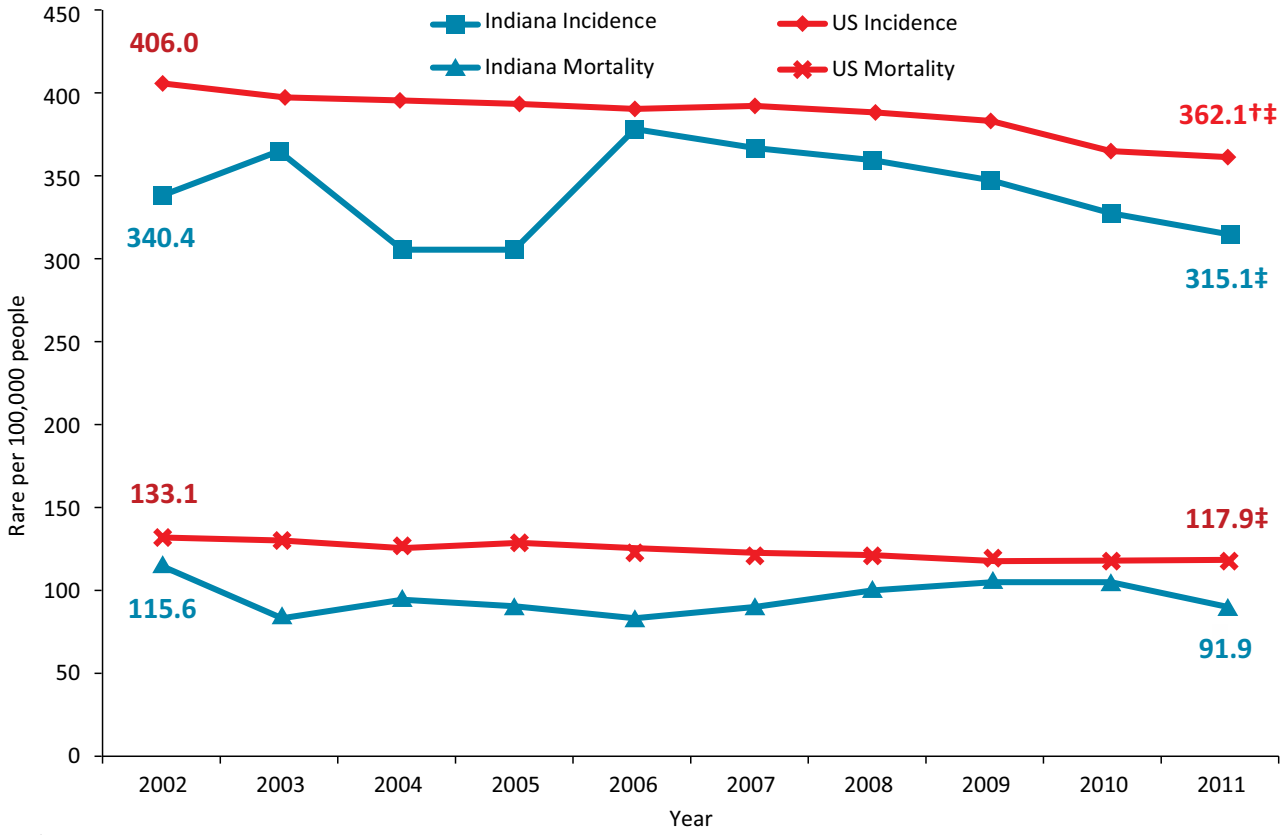
Male	Count	%	Female	Count	%
Prostate	292	23.0%	Breast	391	27.9%
Lung and Bronchus	123	9.7%	Colon and Rectum	133	9.5%
Colon and Rectum	122	9.6%	Thyroid	107	7.6%
Kidney and Renal Pelvis	80	6.3%	Lung and Bronchus	98	7.0%
Non-Hodgkin Lymphoma	63	5.0%	Corpus Uteri	83	5.9%
Urinary Bladder	61	4.8%	Kidney and Renal Pelvis	57	4.1%
Leukemias	55	4.3%	Leukemias	55	3.9%
Liver	46	3.6%	Cervix Uteri	54	3.8%
Stomach	44	3.5%	Ovary	46	3.3%
All Sites	**1,270**		**All Sites**	**1,402**	

Number (%) of Deaths

Male	Count	%	Female	Count	%
Lung and Bronchus	56	18.5%	Breast	42	14.5%
Prostate	36	10.6%	Lung and Bronchus	37	12.8%
Colon and Rectum	33	8.8%	Colon and Rectum	30	10.3%
Pancreas	31	7.3%	Pancreas	26	9.0%
Liver	25	7.3%	Leukemias	22	7.6%
All Sites	**346**		**All Sites**	**290**	

Source: US Cancer Statistics Working Group. US Cancer Statistics: 1999–2011 Incidence and Mortality Web-based Report. Atlanta: US Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute; 2011. Accessed at wonder.cdc.gov on November 21, 2014.

Figure 33. Cancer Incidence and Mortality (Death) Rates for Hispanics* — Indiana and US, 2002–2011



** Age-adjusted*

† US rate is significantly higher (P<.05) than the Indiana rate.

‡ Rate is significantly lower than in 2002.

This section uses national and Indiana-specific results reported by the National Program of Cancer Registries, who develops them based on data supplied annually by the ISCR and other state cancer registries.

What Types of Cancer Impact the Hispanic Community the Most?

The cancer burden among Hispanics living in the US is similar to that seen in their countries of origin.[2] Compared to rates in the US, incidence of breast, colorectal, lung, and prostate cancers are lower in Puerto Rico, Cuba, and Central and South America, whereas incidence rates of cervical, liver, and stomach cancers are higher.[3] There is some evidence that descendants of Hispanic migrants have cancer rates that approach those of non-Hispanic whites because of acculturation.[4-6] "Acculturation" refers to the process by which immigrants adopt the attitudes, values, customs, beliefs, and behaviors of their new culture. The effects of acculturation are complex and can be associated with both positive and negative influences on health.[2] Among Hispanic immigrants to the US, these changes might include increases in smoking, obesity, and alcohol intake and decreases in dietary quality and physical activity.[7] One study found that overall cancer death rates among Hispanics were 22 percent higher among those who were US-born compared to those who were foreign-born.[8] Table 16 provides an overview of the leading types of cancer that have impacted Hispanics in Indiana. Overall, cancer was the leading cause of death among Indiana Hispanics from 2008-2012.[9,10] Lung and bronchus cancer was the most common cause of cancer-related death among Hispanic males and breast cancer was the most common among Hispanic females.[10]

What are the Cancer Disparities Relating to Ethnicity?

In Indiana and the US, for all cancers combined, and for the most common cancers (prostate, female breast, colorectal, and lung), incidence and death rates are lower among Hispanics than among non-Hispanic whites.[11] Cancers for which national rates are higher among Hispanics include stomach, cervix, liver, acute lymphocytic leukemia, and gallbladder.[2]

For 2007-2011, the overall cancer incidence rate for Indiana Hispanics was significantly lower than the national rate for Hispanics (342.3 versus 377.7 per 100,000, respectively).[11] The cancer mortality rate among all Indiana residents was 190.1 deaths per 100,000 people, while it was 91 percent lower among Hispanic Indiana residents at 99.7 deaths per 100,000

people.[10] Additional information about the impact of specific cancer types among Hispanics in the US and Indiana is provided below.

- **Prostate Cancer.** During 2007-2011, the prostate cancer incidence rate among Hispanics in the US was about 20 percent lower than the rate among non-Hispanic whites.[2] In Indiana, during 2007–2011, the incidence rate among Hispanics was significantly lower than the national rate (95.1 versus 120.5 cases per 100,000 males, respectively).[11] During that same time period, the mortality rate in Indiana was similar the national rate (17.0 versus 18.5 deaths per 100,000 males, respectively).[10]
- **Breast Cancer.** The US breast cancer incidence rate among Hispanic females was 37 percent lower than that among non-Hispanic white females.[2] It has been estimated that about seven percent of this difference might be explained by more protective reproductive patterns (lower age at first birth and larger number of children) among Hispanic females.[12, 13] It might also reflect less use of menopause hormone replacement therapy and under-diagnosis because of lower utilization of mammography.[14, 15] Recent studies suggest that ethnic variation in genetic factors that influence breast cancer development might also contribute to some of the difference.[16-18] However, Hispanic females are about 20 percent more likely to die of breast cancer than non-Hispanic white females diagnosed at a similar age and stage.[2] Differences in access to care and treatment likely contribute to this disparity.[20] In Indiana, during 2007–2011, the incidence rate for Hispanics was similar to the national rate for Hispanics (84.2 versus 91.8 cases per 100,000 females, respectively). Additionally, during 2007–2011, the mortality rates were statistically similar (10.9 versus 14.5 deaths per 100,000 females, respectively).
- **Colon and Rectum Cancer.** In the US, colorectal cancer incidence rates for Hispanic males and females are ten percent and 21 percent lower, respectively, than those for non-Hispanic whites.[2] However, the rates for Hispanics in the US are higher than those for residents of Puerto Rico and Spanish-speaking countries in South and Central America.[3,19] Colorectal cancer is rare in developing countries but common in affluent countries, where diets tend to be higher in fat, refined carbohydrates, and animal protein, and levels of physical activity are low. In Indiana, during 2007–2011, the incidence rate for Hispanics was similar to the national rate for Hispanics (37.0 versus 37.9 cases per 100,000 people, respectively). Additionally, during 2007–2011, the mortality rates for Indiana were statistically similar to the national rate (10.7 versus 12.4 deaths per 100,000 people, respectively).
- **Lung Cancer.** In the US, the lung cancer rates for Hispanics are about half those for non-Hispanic whites, because of traditionally lower rates of cigarette smoking and because Hispanics who do smoke are less likely to be daily smokers.[2] In Indiana, during 2007–2011, the incidence rate for Hispanics was similar to the national rate for Hispanics (34.1 versus 34.3 cases per 100,000 people, respectively). During 2007–2011, the mortality rate in Indiana was also similar to the national rate (10.7 versus 12.4 deaths per 100,000 people).

What are the Indiana and US Trends in Cancer Rates for Hispanics?

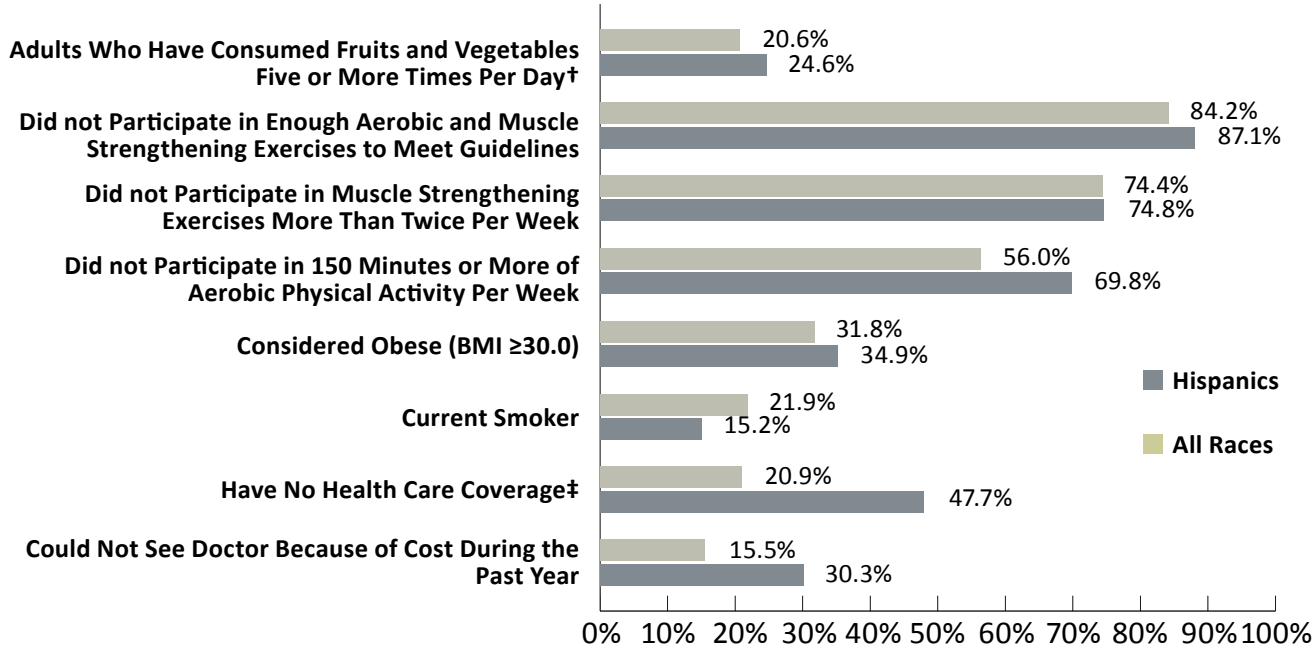
Figure 33 shows how cancer incidence and mortality rates for Hispanics in Indiana and the US have gradually decreased over time. From 2002 to 2011, the incidence rate decreased 33 percent in Indiana and 12.5 percent in the US.[10,11] From 2002 to 2011, the mortality rate decreased 12.3 percent in Indiana and 12.9 percent in the US. There is no clear explanation for why these rates have decreased, although it is important to note that the demographic characteristics of this population changed considerably during those periods.

Can Cancer Be Prevented? *— see the "Take Charge" box for additional information*

Figure 34 describes the burden of some lifestyle and external factors for Hispanic adults in Indiana. Additional information about the impact of cancer risk factors on Hispanics in Indiana include:

- **Body Weight, Diet, and Physical Activity.** Scientific evidence suggests that nationally about one-third of cancer deaths are related to overweight or obesity, physical inactivity, and poor nutrition and thus could be prevented.[20] During 2013, in Indiana, 34.9 percent of Hispanic adults were considered to be obese based on body mass index (BMI).[21] Additionally, in 2013, 68.9 percent of Hispanic adults did not get their recommended 30+ minutes of moderate physical activity five or more days per week (or vigorous physical activity for 20+ minutes three or more days per week). In 2009, about 75 percent of Hispanic adults did not eat the recommended daily servings of fruits and vegetables (*i.e.*, 2 cups of fruit and 2½ cups of vegetables per day).[21]
- **Tobacco.** Cigarette smoking is the major risk factor for lung cancer, accounting for about 87 percent and 70 percent of the cases among males and females, respectively.[22] Hispanics traditionally have a lower smoking rate than other groups. In 2013, 15.2 percent of adult Hispanics reported being current smokers, significantly lower than the rate of 21.9 percent for all Indiana adults.[21] While there was no difference in smoking prevalence between Hispanic males and white, non-Hispanic males (21.5 percent versus 23.5 percent, respectively), Hispanic females were less likely to be current smokers than white, non-Hispanic females (9.1 percent versus 20.7 percent, respectively).
- **Health Care Coverage.** Hispanics are less likely to have health insurance than any other racial or ethnic group,

Figure 34. Preventive Cancer Behaviors and Access to Medical Care for Hispanic Adults* — Indiana, 2013



** Data from 2013*
† Data from 2009
‡ Adults ages 18–64
Note: Adults are ages 18 years and older

Source: Indiana Behavioral Risk Factor Surveillance System

partially because they are much more likely than whites to work in agriculture, construction, domestic and food services, and other low-wage occupations, which are less likely to offer employer-based health insurance benefits.[23] If health coverage is available, it might not be widely affordable. In 2013, in Indiana, Hispanic adults were twice as likely as the total adult prevalence to not see a doctor during the year because of cost (30.3 percent versus 15.5 percent, respectively).[21] In 2013, Indiana Hispanics ages 18–64, were over two times more likely than adults ages 18-64 overall to not have health insurance (47.7 percent versus 20.9 percent, respectively).[21]

Can Cancer Be Detected Early?

Early detection tests can lead to the prevention of cancer through the identification and removal of precancerous lesions. Screening can detect cancer at an earlier stage, which can reduce the extent of treatment, improve the chances of cure, extend life, and thereby improve the quality of life for cancer survivors. The percentage of Hispanic females having a cervical cancer screening (Pap test) within the past three years was similar to the overall female prevalence (71.0 percent versus 73.2 percent, respectively). [21]

What Factors Influence Cancer Survival?

In general, the further a cancer has spread, the less likely that treatment will be effective. Although Hispanics have lower incidence and death rates than non-Hispanic whites for the most common cancers, they are more likely to be diagnosed with a more advanced stage of disease. Overall, the lifetime probability of dying from cancer among Hispanics is 1 in 5 for males and about 1 in 6 for females.[2]

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TAKE CHARGE!

What You Can Do to Help Prevent Cancer and Improve Care for Hispanics

- Maintain a healthy body weight.
- Increase physical activity levels.
- Eat the recommended daily servings of fruits and vegetables.
- Be smoke-free — Visit www.in.gov/quitline for free smoking cessation assistance.
- Identify a primary health care provider and regularly talk about your cancer screening options.
- Seek treatment early and avoid delaying follow-up care if you are diagnosed with cancer.
- Encourage health care providers to identify ways to be able to clearly communicate health information for people with limited English proficiency in their primary language and to be culturally competent (*i.e.,* respectful and responsive to cultural beliefs that influence the health practices of racial and ethnic minority patients).
- Work to decrease the disparities in socioeconomic factors such as employment, income, and insurance status, which influence health behaviors and outcomes.
- Health care providers are encouraged to ask Hispanic patients about their life, encourage them to ask questions, take seriously the responsibility and respect conferred on the provider, and involve family members.[2]

What is a Survivor?

Due to advances in treatment and earlier screenings, more and more people are living after a cancer diagnosis. The American Cancer Society (ACS) defines a cancer survivor as any person who has been diagnosed with cancer, from the time of diagnosis through the balance of life. Survivorship, like cancer itself, is complex and can be difficult to navigate.

There are three phases of cancer survival — the time from diagnosis to the end of initial treatment, the transition from treatment to extended survival, and long term survival.[1] More often than not, the terms "survivor" and "survivorship" are associated with the transitional period after treatment ends. However, survivorship includes a wide range of cancer experiences and paths[2], including:

- Living cancer-free for the remainder of life;
- Living cancer-free for many years, but experiencing one or more serious, late complications of treatment;
- Living cancer-free for many years, but dying after a late recurrence;
- Living cancer-free after the first cancer is treated, but developing a second cancer;
- Living with intermittent periods of active disease requiring treatment; and
- Living with cancer continuously without a disease-free period.

The preferred path for most cancer patients is to receive treatment and be "cured". This is the primary goal of all cancer treatment when possible. For many cancer patients, the initial course of treatment is successful and the cancer does not return.

Many of survivors must still cope with the mid- and long-term effects of treatment, as well as any psychological effects — such as fear of returning disease.[2] It is important that cancer patients, caregivers, and survivors have the information and support needed to help minimize these effects and improve quality of life and treatment.

Survivorship by the Numbers

An estimated 13.7 million Americans with a history of cancer were alive on January 1, 2012, according to the ACS. This estimate does not include carcinoma in situ (non-invasive cancer) of any site, except urinary bladder, and does not include basal and squamous cell carcinomas. If current estimates continue, by January 1, 2022, the population of cancer survivors will increase to almost 18 million nationwide.

According to the Indiana State Cancer Registry, as of December 31, 2012, there were an estimated 286,973 cancer survivors for all cancers combined [Table 17]. The four highest-burden cancers for the state (lung, breast, colorectal and prostate) account for approximately 56 percent of these survivors [Table 18].

Table 17. Indiana Cancer Survivor Counts*

Cancer Type	Counts
Female Breast	63,051
Cervical	4,190
Colorectal	30,491
Lung	16,812
Melanoma	14,950
Prostate	47,482
All Types	**286,973**

** Survivors (anyone treated for an invasive cancer, and still living) as of December 31, 2012*

Source: Indiana State Cancer Registry

Table 18. Percent of Survivors from Four Highest-Burden Cancers*

Cancer Type	Survivorship (Counts)	Survivorship (Percentage)
Female Breast	63,051	22%
Colorectal	30,491	11%
Lung	16,812	6%
Prostate	47,482	17%

** Survivors (anyone treated for an invasive cancer, and still living) as of December 31, 2012.*

Source: Indiana State Cancer Registry

Female Breast

Breast cancer is the second leading cause of cancer death, and, excluding skin cancers, the most frequently diagnosed cancer among Indiana females, with about 4,400 cases diagnosed each year. Sex and age are the two greatest risk factors for developing breast cancer. Females have a much greater risk of developing breast cancer than do males, and that risk increases with age. *[See the breast cancer section of this report for more information.]*

The overall five-year relative survival rate for female breast cancer patients has improved from 75 percent between 1975 and 1977 to 91 percent during 2004 through 2010.[2] For the most part, this is attributed to improvements in treatment and increased use of mammography screening.[3]

According to the ACS, the five-year relative survival rate varies depending on the cancer stage. When breast cancer is detected early, in the local stage, the five-year survival rate is 99 percent. If the cancer has spread regionally (*e.g.*, to a nearby lymph node), that rate decreases to 84 percent. In instances where the breast cancer has spread to distant lymph nodes or organs (the distant stage), the five-year survival rate decreases to 23 percent. Other factors, such as tumor grade, hormone

receptor status, and increased human epidermal growth factor receptor 2 (HER2) protein made by the cancer cells, can influence survival rates.

A common side effect of breast cancer surgery and radiation therapy is lymphedema of the arm. Lymphedema is a buildup of lymph fluid in the tissue under the skin caused by the removal or damage of the lymph nodes under the arm (called the axillary lymph nodes). It can develop soon after treatment, or even several years later. Lymphedema risk can be reduced when only the first lymph nodes to which cancer is likely spread are removed, rather than removing many lymph nodes to determine whether or not the cancer has spread. For patients with lymphedema, there are a number of effective therapies that can be used. Some evidence also suggests that upper-body exercise and physical therapy may reduce the severity and risk of developing this condition.[4]

Other long-term local effects of surgery or radiation treatment include numbness or tightness and pulling or stretching in the chest wall, arms or shoulders. In addition, women diagnosed and treated for breast cancer at a younger age may experience impaired fertility and premature menopause, and are at increased risk of osteoporosis. Aromatase inhibitor treatment can cause muscle pain, joint stiffness and/or pain, and sometimes osteoporosis.

Colorectal Cancer

Colorectal cancer is the third most commonly diagnosed cancer and cause of cancer-related death among both males and females in Indiana. In 2014, the ACS estimated that 3,020 Indiana adults would be diagnosed with colorectal cancer, and 1,090 would die because of the disease. The lifetime risk of developing colorectal cancer is about five percent for both males and females in the United States. Sex and age are the two greatest risk factors. In addition, the *The Health Consequences of Smoking — 50 Years of Progress: A Report of the Surgeon General* indicates that smoking causes colorectal cancer and increases the failure rate of treatment for all cancers. In Indiana, African Americans have higher colorectal cancer incidence and mortality rates than whites, and males have higher rates than females. *[See the colorectal cancer section of this report for more information.]*

The ACS reports that the one- and five-year survival rates for colorectal cancer are 83 percent and 65 percent, respectively. The ten-year survival rate decreases to 58 percent. When colorectal cancer is detected early (in the local stage), the five-year survival rate is 90 percent.[2] When the cancer has spread regionally, the five-year survival rate decreases to 70 percent. The five-year survival rate decreases to only 13 percent when colorectal cancer spreads distantly.

While most long-term survivors report a high quality of life, some are troubled by bowel dysfunction and other health-related issues. For those with a permanent colostomy (a surgical procedure that brings one end of the large intestine out through the abdominal wall), some issues such as problems around intimacy and sexuality, embarrassment, social inhibition, and body-image disturbances may occur.

According to the ACS, as many as 40 percent of patients treated for localized colorectal cancer, and colorectal cancer that has spread to nearby organs, are also at increased risk of second primary cancers of the colon and rectum.

Lung Cancer

Lung cancer is not a single disease; rather, it is a group of cancers that originate in the lung and associated tissues. Lung cancer is the leading cause of preventable and premature cancer deaths in Indiana, killing an estimated 4,000 Indiana residents every year. Smoking accounts for 87 percent of lung cancer deaths and at least 30 percent of all cancer deaths. However, in Indiana, about 22 percent of adults continue to smoke tobacco, placing them at great risk for developing lung and other types of cancer.[5] *[See the lung cancer section of this report for more information.]*

The ACS reports that the one-year relative survival rate for all lung cancers combined increased from 37 percent during 1975-1979 to 45 percent during 2006-2009, largely due to improvements in surgical techniques and combined therapies. The five-year survival rate is highest (54 percent) if the lung cancer is diagnosed when it is confined entirely within the lung (localized). The overall five-year survival rate for small cell lung cancer is six percent, which is lower than that for non-small cell lung cancer (18 percent).

Lung cancer survivors often have impaired lung function, especially if surgery is part of treatment. Respiratory therapy and medications can improve the ability to resume to normal daily activities and improve fitness. Lung cancer survivors who continue to smoke should be encouraged to quit. Survivors of smoking-related cancers are at an increased risk for additional smoking-related cancers, especially in the head, neck and urinary tract. Some survivors may feel stigmatized because of the connection between smoking and lung cancer. This is especially difficult for lung cancer survivors who never smoked.

Prostate Cancer

Prostate cancer is an uncontrolled growth and spread of cells in the prostate, an exocrine gland in the male reproductive system. Excluding all types of skin cancer, prostate cancer is the most commonly diagnosed cancer and the second leading cause of cancer death among Indiana males. There were approximately 2,844 new cases of prostate cancer diagnosed in Indiana during 2012, and there were 606 deaths due to prostate cancer during that same year. The ACS estimates that there were nearly three million males with a history of prostate

cancer living in the US as of January 1, 2014. Older males, African American males, and males with a family history of prostate cancer have a higher risk of being diagnosed. *[See the prostate cancer section of this report for more information.]*

The five-year survival rate of prostate cancer is almost 100 percent when discovered in the local or regional stages. The ACS reports that the five-year survival rate for all stages combined has increased over the past 25 years from 68 percent to almost 100 percent. According to the most recent data, the 10- and 15-year survival rates are 99 percent and 94 percent, respectively.

Many prostate cancer survivors who have been treated with surgery or radiation therapy experience side effects from treatment. These include incontinence, erectile dysfunction and bowel complications. Patients who received hormonal treatment may experience symptoms similar to menopause in women such as loss of libido, hot flashes, night sweats, irritability, and osteoporosis. In the long term, hormone therapy also increases risk of diabetes, cardiovascular disease, and obesity.[6]

Resources

The National Cancer Survivorship Resource Center is a collaboration between the ACS and the George Washington Cancer Institute, funded by the CDC. Its goal is to shape the future of post-treatment cancer survivorship care, and to improve the quality of life for cancer survivors. Staff and more than 100 volunteer survivorship experts nationwide developed tools for cancer survivors, caregivers, health care professionals, and policy and advocacy efforts. For more information, visit www.cancer.org/survivorshipcenter.

The National Coalition for Cancer Survivorship offers free publications and resources that empower people to become strong advocates for their own care or the care of others. The coalition's Cancer Survival Toolbox is a self-learning audio series developed by leading cancer organizations to help people develop crucial skills to understand and meet the challenges of their illness. For more information, visit www.canceradvocacy.org.

The Patient Advocate Foundation is a national nonprofit organization that seeks to safeguard patients through effective mediation assuring access to care, maintenance of employment, and preservation of financial stability. The foundation serves as an active liaison between patients and their insurer, employer and/or creditors to resolve insurance, job retention and debt crisis matters relative to their diagnosis through professional cancer managers, doctors and health care attorneys. For more information, visit www.patientadvocate.org.

Visit the Indiana Cancer Consortium website at IndianaCancer.org to learn more about local resources in your area.

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Recommended Cancer Screening Guidelines

Cancer Type	Risk Factors	Early Detection	Signs and Symptoms
Breast	Sex and age are the two greatest risk factors for developing breast cancer. Females have a much greater risk of developing breast cancer, and that risk increases with age. Factors associated with increased breast cancer risk include weight gain after the age of 18, being overweight or obese, use of menopausal hormone therapy, physical inactivity, and alcohol consumption. Research also indicates that long-term, heavy smoking increases breast cancer risk, particularly among females who start smoking before their first pregnancy. Additional risk factors may include: having one or more first degree relatives who have been diagnosed with breast cancer; having a family member who carries the breast cancer susceptibility genes (BRCA) 1 or 2; being African-American; having a long menstrual history (menstrual periods that start early and/or end later in life); have recently used oral contraceptives or Depo-Provera; have never had children, or had the first child after the age of 30; and certain medical findings such as high breast tissue density, high bone mineral density, Type 2 diabetes, certain benign breast conditions, and lobular carcinoma in situ. In addition, high dose radiation to the chest for cancer treatment increases risk. Factors associated with a decreased risk of breast cancer include breastfeeding, regular moderate or vigorous physical activity, and maintaining a healthy body weight.	Women should have frequent conversations with their health care provider about risks for breast cancer and how often they should be screened. In general, women should follow these recommendations: breast self-awareness (women in their 20s should be aware of the look and feel of their breasts); clinical breast exams (women in their 20s and 30s should have regular exams by a physician); screening mammograms.	The most common symptom of breast cancer is a new lump or mass. It's important to have anything new or unusual checked by a doctor. Other symptoms of breast cancer may include: hard knots, or thickening; swelling, warmth, redness, or darkening; change in size or shape; dimpling or puckering of the skin; itchy, scaly sore, or rash on the nipple; pulling in of the nipple or other parts of the breast; nipple discharge that starts suddenly; or new pain in one spot that doesn't go away. Although these symptoms can be caused by things other than breast cancer, it is important to have them checked out by your doctor.
Cervical	Infection with HPV is the single greatest risk factor for cervical cancer.	Average-risk women, ages 21 to 65 years, should receive a routine Pap test every three years. For women ages 30 and over, who want to extend the time periods between tests, a Pap smear combined with HPV co-testing can be done every five years.	Early stage cervical cancer often has no symptoms. The most common symptom is irregular vaginal bleeding (bleeding that starts and stops between periods, or after intercourse). Bleeding after menopause or increased vaginal discharge may also be symptoms
Colon and Rectum (Colorectal)	Indiana residents may have an increased risk if they are age 50 or over; male; African-American; have a personal history of cigarette smoking; have a personal or family history of colorectal cancer, inflammatory bowel disease, or certain inherited genetic conditions; have diabetes; are obese; are physically inactive; eat a diet high in red or processed meat and/or low in whole-grain fiber, fruits and vegetables; and have heavy alcohol consumption.	Beginning at age 50, both men and women with average risk for colorectal cancer should follow one of these schedules: 1) Tests that find polyps and cancer, such as a colonoscopy every ten years or a flexible sigmoidoscopy, double-contrast barium enema, or computed tomography colonography every five years. Or, 2) Tests that primarily find cancer such as yearly fecal occult blood test (FOBT) or fecal immunochemical test (FIT).	Early stage colorectal cancer typically has no symptoms. Later stage colorectal cancer symptoms include rectal bleeding, blood in stool, change in bowel habits, cramping pain in lower abdomen, decreased appetite or weight loss, weakness, and extreme fatigue.

Prevention	United States Preventive Services Task Force (USPSTF) Screening Guidelines	American Cancer Society Screening Guidelines
Individuals can take charge of their health by knowing their risk and talking to their doctor about personal and family history; getting screened regularly; avoiding tobacco use; maintaining a healthy weight; getting the recommended levels of moderate or vigorous physical activity; limiting alcohol consumption; limiting postmenopausal hormone use; and breastfeeding.	The USPSTF recommends biennial mammography for women ages 50-74. In addition, women should talk to their doctors about whether or not earlier screenings are needed.	The ACS recommends breast self-examination for women beginning in their 20s (women should be informed of the benefits and limitations of self-exams); clinical breast exams for women in their 20s and 30s, preferably every three years; and begin screening mammograms yearly at age 40.
Individuals can help prevent cervical cancer by getting the HPV vaccination, practicing safe sex, avoiding tobacco, getting routine screenings, getting HPV and Pap co-testing (women over the age of 30); and watch for abnormal vaginal discharge or bleeding.	The USPSTF recommends screening for cervical cancer in women age 21 to 65 years with cytology (Pap smear) every 3 years or, for women age 30 to 65 years who want to lengthen the screening interval, screening with a combination of cytology and HPV testing every five years.	The ACS recommends Pap test screening for women ages 21-29. For women ages 30-65, screening should be done every five years with both the HPV test and the Pap test, or every three years with the Pap test alone.
Individuals can take charge of their health by getting regular, routine screenings, maintaining a healthy weight, adopting a physically active lifestyle, avoiding tobacco products, limiting alcohol consumption, and consuming a healthy diet that emphasizes plant sources, supports a healthy weight, includes at least two and a half cups of a variety of vegetables and fruits each day, includes whole grains and limits processed and red meats.	The USPSTF recommends colorectal cancer screening for adults aged 50-75 using high-sensitivity FOBT once a year, flexible sigmoidoscopy every five years (when done in combination with a high-sensitivity FOBT, the FOBT should be done every three years), or colonoscopy every 10 years. Colonoscopy is also used as a follow-up test if anything unusual is found during one of the other screening tests.	The ACS recommends screening for men and women beginning at age 50 using a FOBT or FIT every year, a stool DNA test every three years, a double-contrast barium enema every five years, a colonoscopy every ten years, or a CT colonography every five years.

Recommended Cancer Screening Guidelines

Cancer Type	Risk Factors	Early Detection	Signs and Symptoms
Lung	Smoking is the greatest risk factor for lung cancer. In addition, individuals at increased risk include those exposed to second-hand smoke; those exposed to other cancer-causing agents (such as asbestos, radon, arsenic, talc, vinyl chloride, coal products, and radioactive ores); males; and African-Americans.	Findings from the National Cancer Institute's National Lung Screening Trial established screening with the use of low-dose computed tomography in specific high-risk groups has been shown to be effective in reducing mortality.	Lung cancer symptoms do not usually occur until the cancer is advanced. Common signs and symptoms of lung cancer include a persistent cough, sputum streaked with blood, chest pain, voice changes, and recurrent pneumonia or bronchitis.
Melanoma/Skin Cancer	People of all ages, races and ethnicities are subject to developing skin cancer. Indiana residents may have increased risk if they are ages 50 or older; male; white; have fair to light skinned complexions; have natural blond or red hair; have blue or green eyes; have a large number of moles (more than 50); have a family history of melanoma; have excessive exposure to UV radiation from the sun or tanning beds; have a history of sunburn at an early age; have a weakened immune system or are being treated with immune-suppressing medicines; have a past history of basal or squamous cell skin cancers; and have an occupational exposure to coal tar, pitch, creosote, arsenic compounds, radium or some pesticides.	Indiana residents should be aware of any changes in skin growths or the appearance of new growths. Adult should thoroughly examine their skin regularly, preferably once a month. New or unusual lesions or a progressive change in a lesion's appearance (size, shape, or color for example) should be evaluated promptly by a health care provider.	A simple ABCDE rule outlines some warning signs of melanoma: A for Asymmetry (one half of the mole or lesion does not match the other half); B for Border (border irregularity, edges that are ragged, notched or blurred); C for Color (the pigmentation is not uniform, with variable degrees of tan, brown or black); D for Diameter (if the diameter is greater than 6 millimeters - or the size of a pencil eraser); and E for Evolution (moles that change in shape, size or color).
Prostate	Indiana residents may have an increased risk for prostate cancer if they are; over the age of 50; African American; or if they have a first-degree relative (a father, brother or son) with a history of prostate cancer.	Not all experts agree that screening for prostate cancer will save lives. The controversy focuses on the cost of screening, the age groups to be screened, and the potential for serious side effects associated with treatment after diagnosis. Not all forms of prostate cancer need treatment.	In the early stage, prostate cancer may not cause symptoms. It is important to know that some men have no symptoms at all. Other symptoms can include difficulty starting urination; weak or interrupted flow of urine; frequent urination (especially at night); inability to empty the bladder completely; pain or burning during urination; blood in the urine or semen; painful ejaculation; trouble having an erection; pain in the back, hips, or pelvis that doesn't go away.

Prevention	United States Preventive Services Task Force (USPSTF) Screening Guidelines	American Cancer Society Screening Guidelines
Individuals can help prevent lung cancer by being tobacco free and avoiding exposure to second-hand smoke.	The USPSTF recommends annual screening for lung cancer with low-dose computed tomography (LDCT) in adults aged 55 to 80 years who have a 30 pack-year smoking history and currently smoke or have quit within the past 15 years. Screening should be discontinued once a person has not smoked for 15 years or develops a health problem that substantially limits life expectancy or the ability or willingness to have curative lung surgery.	The ACS recommends LDCT for current smokers, or former smokers (who have quit within the past 15 years), ages 55-74 with at least a 30 pack-per-year history.
Individuals can take charge of their health by limiting or avoiding exposure to the sun during peak hours (10 a.m. to 4 p.m.); wearing sunscreen with a SPF of 30 or higher that protects from both UVA and UVB rays; wearing clothing that has built-in SPF in the fabric, or wearing protective clothing such as long sleeves and long pants; wearing a hat that protects your scalp and shades your face, neck and ears; avoiding use of tanning beds and sun lamps; wearing sunglasses to protect your eyes; and always protecting skin. In addition, any new or unusual lesions or a progressive change in a lesion's appearance should be evaluated by a physician.	The USPSTF recommends counseling children, adolescents, and young adults aged 10 to 24 years who have fair skin about minimizing their exposure to ultraviolet radiation to reduce risk for skin cancer.	
Individuals can help prevent prostate cancer by eating a healthy diet with at least five servings of fruits and vegetables each day; limiting their intake of red and processed meats; avoiding excessive consumption of dairy products; include lycopene and vitamin E in the diet; and meet recommended levels of physical activity.	The USPSTF recommends against prostate-specific antigen (PSA)-based screening for prostate cancer.	Beginning at age 50, men who have at least a 10-year life expectancy should have an opportunity to make an informed decision with their health care provider about whether to be screened for prostate cancer, after receiving information about the potential benefits, limitations, and uncertainties associated with prostate cancer screening. Men at high risk should have this discussion with their health care provider beginning at age 45.

The Impact of Cancer in Indiana

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Average Cases Per Year

(2008-2012)

About 2 in 5 people now living in Indiana will eventually develop cancer. Nationally, men have almost a 1 in 2 chance of developing cancer during their lifetime; women's lifetime risk of developing cancer is slightly more than 1 in 3.

The Indiana Cancer Facts and Figures 2015 provides the most up-to-date cancer information available and identifies current cancer trends and their potential impact on Indiana residents. Download a free copy at IndianaCancer.org.

32,620 Hoosiers were diagnosed with cancer each year

16,203 of those Hoosiers were male

16,417 of those Hoosiers were female

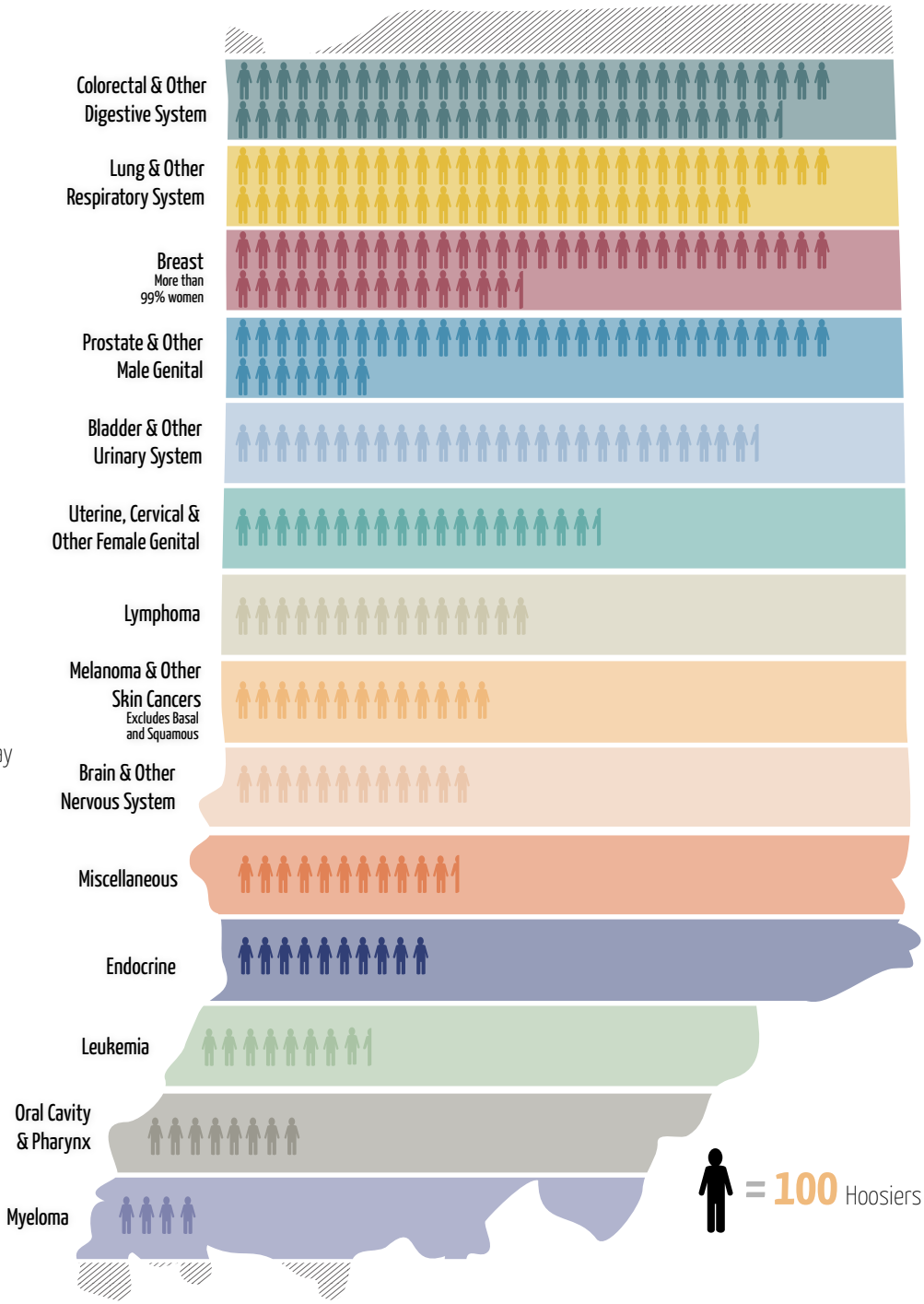
Meaning approximately...

89 Hoosiers were diagnosed with cancer every day

Estimated economic impact* ...

$1.92 billion is estimated to be spent in 2015 on direct costs of treating cancer in Indiana

$2.76 billion is the estimated amount of money Hoosiers will spend on direct costs for cancer care in 2023 if current trends continue



Data from: 2008-2012 Indiana State Cancer Registry (accessed April 6, 2015) and *The Milken Institute

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