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## Years of Potential Life Lost by Sex, Race, and Ethnicity North Carolina, 2000

by

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### ABSTRACT

**Objectives:** Premature deaths are a national problem and reduction of these deaths is an important objective for health policy. This study measures premature mortality in terms of years of potential life lost (YPLL), by considering the number of potential years left to live at each age of death.

**Methods:** For each North Carolina resident who died in 2000, the remaining life expectancy at the time of death was summed to calculate the total YPLL for the major causes of death. Deaths were ranked by number of deaths and by YPLL for the total population, males, females, Whites, African Americans, American Indians, other races, Hispanics, and non-Hispanics. Average YPLL per death was also calculated.

**Results:** Heart disease, cancer, and cerebrovascular disease rank high on both total number of deaths and YPLL. Causes where more young people are dying rank higher on YPLL than on number of deaths. For example, unintentional motor vehicle injuries was the ninth leading cause of death in 2000 for number of deaths, but it ranked third based on YPLL. African Americans have relatively high rankings on YPLL for perinatal conditions, homicide, and HIV disease. The relatively young age of the Hispanic population in North Carolina means that their average YPLL per death is much higher than for the non-Hispanic population, including causes of death normally associated with older people.

**Conclusions:** Calculating YPLL is a useful means for assessing the impact of deaths at younger ages. Preventing premature deaths is consistent with the national Healthy People 2010 objectives, and should be a major priority of public health programs in North Carolina.



## Introduction

Premature deaths are a national problem and reduction of these deaths is an important objective for health policy.<sup>1</sup> One way of measuring premature mortality is to calculate years of potential life lost (YPLL), which takes into account the number of potential years left to live at each age of death. This method can be used to examine years of life lost for people of all ages, since even at the oldest ages some additional years of life are expected.

Although YPLL is often calculated for deaths prior to age 65 or 75,<sup>2,3,4</sup> as a measure of years of “productive” or “working” life lost, this study looks at the loss of potential life for all deaths in North Carolina in 2000. This allows one to examine the impact of certain causes of death on the state’s entire population, not just a particular age range. In addition, by comparing YPLL between the sexes and among racial and ethnic groups, we can see that disparities in mortality go beyond just the number of deaths. It is important that community-based prevention programs account for the special needs of different populations, including minorities.<sup>3,4</sup>

## Methods

Life expectancy data for the total North Carolina population by specific age group were used to calculate YPLL<sup>5</sup> (see Appendix A). Each decedent’s remaining life expectancy at the time of death was summed to calculate the total YPLL for each cause of death. The average YPLL per death for each cause was calculated by dividing the total YPLL by the total number of deaths. Causes of death were selected to represent the 15 leading causes of death for the total North Carolina population in 2000 plus three of the leading causes of death for infants. YPLL was calculated for the following demographic groups: total population, males, females, Whites, African Americans, American Indians, other races, Hispanics, and non-Hispanics.

## Results

Tables 1-3 contain the YPLL for deaths occurring in 2000 for the total population, males, and females, ranked by YPLL. The rank of each cause of death based on number of deaths is also shown. Heart disease, cancer, and cerebrovascular disease rank high on both total number of deaths and YPLL. However, other causes have different rankings. For

**Table 1: Rank by YPLL for Total Population  
North Carolina Resident Deaths, 2000**

Cause	YPLL	# of Deaths	Avg YPLL per Death	Rank on # of Deaths
<b>All Causes</b>	1,181,176	71,732	16.5	
<b>1 Cancer</b>	259,318	15,747	16.5	<b>2</b>
<b>2 Heart Disease</b>	254,914	19,649	13.0	<b>1</b>
<b>3 Unintentional MV Injuries</b>	65,943	1,635	40.3	<b>9</b>
<b>4 Cerebrovascular Disease</b>	62,794	5,692	11.0	<b>3</b>
<b>5 Other Unintentional Injuries</b>	48,644	1,833	26.5	<b>7</b>
<b>6 Chronic Lower Respiratory Disease</b>	47,992	3,695	13.0	<b>4</b>
<b>7 Perinatal Conditions</b>	45,474	602	75.5	<b>15</b>
<b>8 Suicide</b>	34,847	952	36.6	<b>12</b>
<b>9 Diabetes Mellitus</b>	32,091	2,078	15.4	<b>5</b>
<b>10 Homicide</b>	29,960	652	46.0	<b>14</b>
<b>11 Pneumonia &amp; Influenza</b>	21,065	1,936	10.9	<b>6</b>
<b>12 Chronic Liver Disease &amp; Cirrhosis</b>	18,297	784	23.3	<b>13</b>
<b>13 Birth Defects</b>	18,052	305	59.2	<b>17</b>
<b>14 HIV</b>	17,505	462	37.9	<b>16</b>
<b>15 Nephritis/Nephrotic Syn/Nephrosis</b>	17,481	1,311	13.3	<b>10</b>
<b>16 Septicemia</b>	14,711	1,047	14.1	<b>11</b>
<b>17 Alzheimer’s Disease</b>	13,272	1,725	7.7	<b>8</b>
<b>18 SIDS</b>	7,182	95	75.6	<b>18</b>
<b>All Other Causes</b>	171,632	11,532	14.9	

**Table 2: Rank by YPLL for Males  
North Carolina Resident Deaths, 2000**

Cause	YPLL	# of Deaths	Avg YPLL per Death	Rank on # of Deaths
<i>All Causes</i>	670,322	35,227	19.0	
<b>1 Heart Disease</b>	147,426	9,618	15.3	<b>1</b>
<b>2 Cancer</b>	140,288	8,464	16.6	<b>2</b>
<b>3 Unintentional MV Injuries</b>	47,404	1,151	41.2	<b>5</b>
<b>4 Other Unintentional Injuries</b>	35,417	1,148	30.9	<b>6</b>
<b>5 Cerebrovascular Disease</b>	27,469	2,147	12.8	<b>3</b>
<b>6 Suicide</b>	27,081	735	36.8	<b>9</b>
<b>7 Chronic Lower Respiratory Disease</b>	25,466	1,931	13.2	<b>4</b>
<b>8 Perinatal Conditions</b>	24,840	329	75.5	<b>16</b>
<b>9 Homicide</b>	23,821	507	47.0	<b>11</b>
<b>10 Diabetes Mellitus</b>	15,635	914	17.1	<b>7</b>
<b>11 HIV</b>	12,498	334	37.4	<b>15</b>
<b>12 Chronic Liver Disease &amp; Cirrhosis</b>	12,367	499	24.8	<b>12</b>
<b>13 Pneumonia &amp; Influenza</b>	10,141	781	13.0	<b>8</b>
<b>14 Birth Defects</b>	10,008	165	60.7	<b>17</b>
<b>15 Nephritis/Nephrotic Syn/Nephrosis</b>	8,532	596	14.3	<b>10</b>
<b>16 Septicemia</b>	6,768	428	15.8	<b>14</b>
<b>17 Alzheimer's Disease</b>	3,713	429	8.7	<b>13</b>
<b>18 SIDS</b>	3,478	46	75.6	<b>18</b>
<i>All Other Causes</i>	87,970	5,005	17.6	

**Table 3: Rank by YPLL for Females  
North Carolina Resident Deaths, 2000**

Cause	YPLL	# of Deaths	Avg YPLL per Death	Rank on # of Deaths
<i>All Causes</i>	510,854	36,505	14.0	
<b>1 Cancer</b>	119,030	7,283	16.3	<b>2</b>
<b>2 Heart Disease</b>	107,489	10,031	10.7	<b>1</b>
<b>3 Cerebrovascular Disease</b>	35,325	3,545	10.0	<b>3</b>
<b>4 Chronic Lower Respiratory Disease</b>	22,526	1,764	12.8	<b>4</b>
<b>5 Perinatal Conditions</b>	20,635	273	75.6	<b>13</b>
<b>6 Unintentional MV Injuries</b>	18,539	484	38.3	<b>11</b>
<b>7 Diabetes Mellitus</b>	16,457	1,164	14.1	<b>6</b>
<b>8 Other Unintentional Injuries</b>	13,227	685	19.3	<b>9</b>
<b>9 Pneumonia &amp; Influenza</b>	10,923	1,155	9.5	<b>7</b>
<b>10 Alzheimer's Disease</b>	9,559	1,296	7.4	<b>5</b>
<b>11 Nephritis/Nephrotic Syn/Nephrosis</b>	8,950	715	12.5	<b>8</b>
<b>12 Birth Defects</b>	8,044	140	57.5	<b>16</b>
<b>13 Septicemia</b>	7,943	619	12.8	<b>10</b>
<b>14 Suicide</b>	7,766	217	35.8	<b>14</b>
<b>15 Homicide</b>	6,139	145	42.3	<b>15</b>
<b>16 Chronic Liver Disease &amp; Cirrhosis</b>	5,930	285	20.8	<b>12</b>
<b>17 HIV</b>	5,007	128	39.1	<b>17</b>
<b>18 SIDS</b>	3,704	49	75.6	<b>18</b>
<i>All Other Causes</i>	83,662	6,527	12.8	

example, unintentional motor vehicle (MV) injuries was the ninth leading cause of death in 2000 for number of deaths, but it ranked third based on YPLL. This is because MV injuries tend to occur among younger persons, where the potential life lost is far greater than for older persons. Causes of death where more young people are dying rank higher on YPLL than on number of deaths. A prominent example is deaths due to perinatal conditions. On a similar note, we can see that cerebrovascular disease accounts for a far greater number of deaths than unintentional MV injuries, but results in fewer YPLL. This is because cerebrovascular disease tends to affect an older population than MV injuries.

When comparing YPLL versus number of deaths for males and females, the two groups show some interesting differences. For example, when examining deaths due to heart disease, we can see that there are 413 more deaths for females than for males; however, males have almost 40,000 more years of life lost than do females. This means that males die from heart disease at a younger age than do females. Similarly, the average YPLL per death for other unintentional injuries is much lower for

women than for men due substantially to deaths among women from falls, which occur at an older age.

Tables 4-7 contain the 2000 YPLL by race, ranked by YPLL. Although the majority of causes show similar ranks by YPLL and by number of deaths across the four racial groups, there are some dissimilarities. For example, although Alzheimer's Disease ranks much higher on the number of deaths for Whites than for the other racial groups, it ranks low in YPLL for all the races—because Alzheimer's deaths occur at the oldest ages. When we compare African Americans to the other racial groups, nephritis and nephrosis rank relatively high on the number of deaths for African Americans, whereas it is lower for the other racial groups. Nephritis also ranks somewhat higher in YPLL for African Americans than it does for the other racial groups. Though African Americans have less than one-third the total number of deaths as Whites, the number and ranking of deaths and YPLL for perinatal conditions, homicide, and HIV are higher for African Americans. It should be noted that deaths to American Indians are most likely underreported due to misclassification on death certificates.<sup>1, 6</sup>

Cause	YPLL	# of Deaths	Avg YPLL per Death	Rank on # of Deaths
<b>All Causes</b>	839,839	55,241	15.2	
<b>1 Cancer</b>	198,357	12,375	16.0	<b>2</b>
<b>2 Heart Disease</b>	188,548	15,419	12.2	<b>1</b>
<b>3 Unintentional MV Injuries</b>	47,444	1,197	39.6	<b>9</b>
<b>4 Cerebrovascular Disease</b>	44,481	4,401	10.1	<b>3</b>
<b>5 Chronic Lower Respiratory Disease</b>	40,794	3,244	12.6	<b>4</b>
<b>6 Other Unintentional Injuries</b>	35,919	1,428	25.2	<b>7</b>
<b>7 Suicide</b>	29,575	836	35.4	<b>10</b>
<b>8 Perinatal Conditions</b>	21,509	285	75.5	<b>15</b>
<b>9 Diabetes Mellitus</b>	19,115	1,305	14.6	<b>8</b>
<b>10 Pneumonia &amp; Influenza</b>	16,023	1,596	10.0	<b>5</b>
<b>11 Chronic Liver Disease &amp; Cirrhosis</b>	13,536	614	22.0	<b>13</b>
<b>12 Birth Defects</b>	12,937	229	56.5	<b>16</b>
<b>13 Homicide</b>	12,434	289	43.0	<b>14</b>
<b>14 Alzheimer's Disease</b>	11,573	1,507	7.7	<b>6</b>
<b>15 Nephritis/Nephrotic Syn/Nephrosis</b>	9,526	824	11.6	<b>11</b>
<b>16 Septicemia</b>	9,190	700	13.1	<b>12</b>
<b>17 SIDS</b>	3,553	47	75.6	<b>18</b>
<b>18 HIV</b>	3,425	89	38.5	<b>17</b>
<b>All Other Causes</b>	121,901	8,856	13.8	

**Table 5: Rank by YPLL for African Americans  
North Carolina Resident Deaths, 2000**

Cause	YPLL	# of Deaths	Avg YPLL per Death	Rank on # of Deaths
<i>All Causes</i>	322,081	15,694	20.5	
1 Heart Disease	63,319	4,034	15.7	1
2 Cancer	57,520	3,204	18.0	2
3 Perinatal Conditions	22,680	300	75.6	13
4 Cerebrovascular Disease	17,737	1,250	14.2	3
5 Homicide	16,113	335	48.1	10
6 Unintentional MV Injuries	15,892	381	41.7	7
7 HIV	13,990	371	37.7	9
8 Diabetes Mellitus	12,338	735	16.8	4
9 Other Unintentional Injuries	11,746	379	31.0	8
10 Nephritis/Nephrotic Syn/Nephrosis	7,772	474	16.4	5
11 Chronic Lower Respiratory Disease	6,689	419	16.0	6
12 Septicemia	5,307	332	16.0	11
13 Pneumonia & Influenza	4,783	323	14.8	12
14 Birth Defects	4,586	69	66.5	17
15 Suicide	4,579	101	45.3	16
16 Chronic Liver Disease & Cirrhosis	4,313	155	27.8	15
17 SIDS	3,553	47	75.6	18
18 Alzheimer's Disease	1,625	208	7.8	14
<i>All Other Causes</i>	47,539	2,577	18.4	

**Table 6: Rank by YPLL for American Indians  
North Carolina Resident Deaths, 2000**

Cause	YPLL	# of Deaths	Avg YPLL per Death	Rank on # of Deaths
<i>All Causes</i>	13,346	601	22.2	
1 Heart Disease	2,477	165	15.0	1
2 Cancer	2,157	115	18.8	2
3 Unintentional MV Injuries	1,768	38	46.5	3
4 Homicide	1,224	24	51.0	7
5 Perinatal Conditions	680	9	75.6	15
6 Other Unintentional Injuries	641	16	40.0	8
7 Diabetes Mellitus	575	32	18.0	5
8 Cerebrovascular Disease	459	32	14.3	4
9 Chronic Liver Disease & Cirrhosis	448	15	29.9	10
10 Suicide	409	9	45.4	14
11 Chronic Lower Respiratory Disease	380	26	14.6	6
12 Pneumonia & Influenza	232	15	15.5	9
13 Septicemia	184	12	15.3	11
14 Birth Defects	151	2	75.6	16
15 Nephritis/Nephrotic Syn/Nephrosis	137	10	13.7	13
16 Alzheimer's Disease	74	10	7.4	12
17 HIV	38	1	38.0	17
18 SIDS	0	0	0.0	18
<i>All Other Causes</i>	1,313	70	18.8	

**Table 7: Rank by YPLL for Other Races  
North Carolina Resident Deaths, 2000**

Cause	YPLL	# of Deaths	Avg YPLL per Death	Rank on # of Deaths
<b>All Causes</b>	5,911	196	30.2	
<b>1 Cancer</b>	1,285	53	24.2	<b>1</b>
<b>2 Unintentional MV Injuries</b>	838	19	44.1	<b>3</b>
<b>3 Perinatal Conditions</b>	605	8	75.6	<b>6</b>
<b>4 Heart Disease</b>	570	31	18.4	<b>2</b>
<b>5 Birth Defects</b>	378	5	75.6	<b>10</b>
<b>6 Other Unintentional Injuries</b>	339	10	33.9	<b>4</b>
<b>7 Suicide</b>	285	6	47.5	<b>9</b>
<b>8 Homicide</b>	190	4	47.4	<b>11</b>
<b>9 Chronic Lower Respiratory Disease</b>	130	6	21.6	<b>7</b>
<b>10 Cerebrovascular Disease</b>	117	9	13.0	<b>5</b>
<b>11 AIDS</b>	76	1	75.6	<b>16</b>
<b>12 Diabetes Mellitus</b>	64	6	10.6	<b>8</b>
<b>13 HIV</b>	52	1	52.1	<b>15</b>
<b>14 Nephritis/Nephrotic Syn/Nephrosis</b>	46	3	15.5	<b>12</b>
<b>15 Septicemia</b>	30	3	10.1	<b>13</b>
<b>16 Pneumonia &amp; Influenza</b>	26	2	13.1	<b>14</b>
<b>17 Chronic Liver Disease &amp; Cirrhosis</b>	0	0	0.0	<b>17</b>
<b>18 Alzheimer's Disease</b>	0	0	0.0	<b>18</b>
<b>All Other Causes</b>	880	29	30.3	

Tables 8-9 contain the 2000 YPLL for Hispanics and non-Hispanics ranked by YPLL. When reviewing data regarding Hispanic status it is important to keep in mind that Hispanics are an ethnic group, not a racial group. Most Hispanics in North Carolina are included in the White racial group. An important fact about the Hispanic population in North Carolina is that they are relatively young. For example, approximately 87 percent of Hispanics are under age 45, compared to 67 percent for non-Hispanics. Also, deaths to Hispanics are likely underreported due to misclassification on death certificates. The relatively young age of the Hispanic population accounts for their average YPLL per death being so much higher than the non-Hispanic population, including causes of death normally associated with older people.

## Conclusions

Calculating Years of Potential Life Lost is a useful means for assessing the impact of deaths at younger ages. Some causes of death rank much higher on

YPLL than on number of deaths, particularly motor vehicle injuries and perinatal conditions.

The data presented here have some implications for health promotion programs. For example, heart disease prevention programs need to target minority groups as well as Whites because, while the number of deaths from heart disease ranks high for all racial groups, the average YPLL per death is higher for minorities. Programs to reduce deaths due to perinatal conditions among African Americans would have a relatively large impact on years of potential life lost in this population. Health prevention programs for Hispanics in North Carolina, even for chronic diseases that normally affect primarily older persons, should be oriented to this very young population.

Preventing premature deaths is consistent with the national Healthy People 2010 objectives, and should be a major priority of public health programs in North Carolina. YPLL is a good summary measure for assessing progress in this area.

**Table 8: Rank by YPLL for Hispanics  
North Carolina Resident Deaths, 2000**

Cause	YPLL	# of Deaths	Avg YPLL per Death	Rank on # of Deaths
<i>All Causes</i>	20,822	456	45.7	
1 Unintentional MV Injuries	6,604	126	52.4	1
2 Homicide	2,772	54	51.3	2
3 Other Unintentional Injuries	1,892	38	49.8	4
4 Perinatal Conditions	1,814	24	75.6	6
5 Birth Defects	1,210	16	75.6	7
6 Cancer	1,054	43	24.5	3
7 Heart Disease	764	37	20.6	5
8 Suicide	568	11	51.7	10
9 SIDS	529	7	75.6	12
10 HIV	348	8	43.5	11
11 Cerebrovascular Disease	274	11	24.9	8
12 Diabetes Mellitus	214	11	19.5	9
13 Chronic Liver Disease & Cirrhosis	139	5	27.8	14
14 Pneumonia & Influenza	116	5	23.2	13
15 Chronic Lower Respiratory Disease	109	3	36.2	15
16 Nephritis/Nephrotic Syn/Nephrosis	86	2	43.0	16
17 Alzheimer's Disease	5	1	5.4	17
18 Septicemia	0	0	0.0	18
<i>All Other Causes</i>	2,324	54	43.0	

**Table 9: Rank by YPLL for Non-Hispanics  
North Carolina Resident Deaths, 2000**

Cause	YPLL	# of Deaths	Avg YPLL per Death	Rank on # of Deaths
<i>All Causes</i>	1,160,354	71,276	16.3	
1 Cancer	258,264	15,704	16.4	2
2 Heart Disease	254,150	19,612	13.0	1
3 Cerebrovascular Disease	62,520	5,681	11.0	3
4 Unintentional MV Injuries	59,339	1,509	39.3	9
5 Chronic Lower Respiratory Disease	47,884	3,692	13.0	4
6 Other Unintentional Injuries	46,752	1,795	26.0	7
7 Perinatal Conditions	43,660	578	75.5	15
8 Suicide	34,279	941	36.4	12
9 Diabetes Mellitus	31,877	2,067	15.4	5
10 Homicide	27,189	598	45.5	14
11 Pneumonia & Influenza	20,949	1,931	10.8	6
12 Chronic Liver Disease & Cirrhosis	18,158	779	23.3	13
13 Nephritis/Nephrotic Syn/Nephrosis	17,395	1,309	13.3	10
14 HIV	17,157	454	37.8	16
15 Birth Defects	16,843	289	58.3	17
16 Septicemia	14,711	1,047	14.1	11
17 Alzheimer's Disease	13,267	1,724	7.7	8
18 SIDS	6,653	88	75.6	18
<i>All Other Causes</i>	169,308	11,478	14.8	

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## Appendix A

### Average Years of Life Remaining by Age Based on 1996-2000 Life Tables for All North Carolina Residents

<b>Age Group</b>	<b>Life Expectancy</b>
00-04	75.6
05-09	71.4
10-14	66.5
15-19	61.6
20-24	56.8
25-29	52.1
30-34	47.3
35-39	42.6
40-44	38.0
45-49	33.5
50-54	29.1
55-59	24.8
60-64	20.8
65-69	17.1
70-74	13.7
75-79	10.6
80-84	7.9
85 +	5.4



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