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# Asthma Burden Report New Hampshire 2010

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## Chapter 6: Asthma Mortality



## Preface

In order to get these data to you in a timely manner, the New Hampshire Asthma Control Program has decided to publish chapters of the *Asthma Burden Report – New Hampshire 2010* as they are completed. When new chapters are published, the appendices will be updated if needed. The primary purpose of this report is to disseminate data to the Asthma Control Program’s partners, health care providers, insurers and public health professionals so this information can be used to develop, plan, implement and evaluate asthma-related activities.

## Acknowledgements

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# Asthma Mortality

## Highlights:

- Between 2000 and 2006, an average of 15 deaths occurred among NH residents each year with asthma as the underlying cause of death.
- Asthma deaths declined 50% from 1995-1997 to 2004-2006. This decline takes into account the change in ICD codes described below.
- For those deaths with asthma listed as a contributing cause of death, 41.3% of the underlying causes of death were related to the circulatory system (i.e., heart disease).

Asthma-related deaths represent the most extreme consequence of asthma and are rare. This chapter presents information on the number and rate of deaths due to asthma among New Hampshire residents from 1990 to 2006. It was not possible to determine whether asthma mortality rates in New Hampshire varied by geographic location due to the small number of deaths in each population subgroup during this time period.

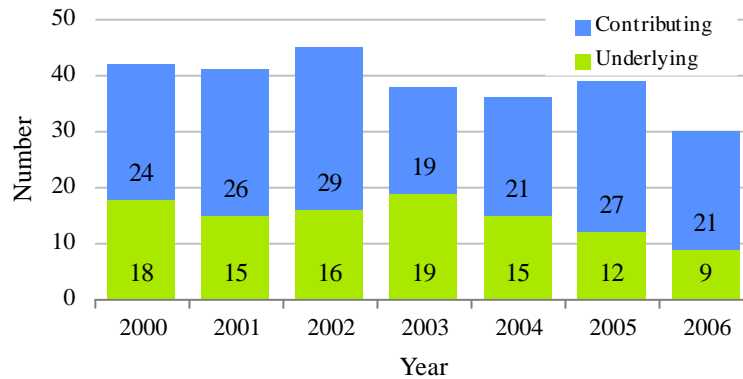
Death data from 1990-1998 were coded under the Ninth Revision of the International Classification of Diseases (ICD-9); a diagnosis code for 493.0-493.9 was used to identify asthma deaths during these years. ICD Revision 10 was implemented in 1999; the ICD-10 asthma diagnosis codes J-45 and J-46 were used to identify asthma deaths that occurred from 1999-2006. In order to account for the effect of implementing ICD-10 codes, comparability ratios for selected causes of death were calculated by the National Center for Health Statistics, National Vital Statistics System. The comparability ratio for asthma is 0.8938. This means that changes in the selection and grouping of underlying causes of death under ICD-10 reduced the possibility of asthma being coded as the underlying cause of death by 11%. For the purposes of this report, the comparability ratio was applied to rate calculations seen in Tables 6.2 and 6.3 to account for the change in ICD coding; it was not applied to Figures 6.1 and 6.2 which show reported number of deaths.

## Definitions:

Asthma death	= Asthma listed as the underlying cause of death.
Underlying cause of death	= The disease or injury that initiated the chain of events leading directly to death or the circumstance of the accident or violence that produced the injury.
Contributing cause of death	= A significant condition that unfavorably influences the course of the morbid process and thus contributes to the fatal outcome, but which is not related to the disease or condition directly causing death.
Comparability ratio for asthma deaths	= Used to adjust the number of asthma deaths that occurred before 1999 so that they can be compared to those that occurred from 1999 onward.

See Appendix A for a description of data sources and Appendix B for technical notes and methods used to analyze the data; these documents are located at [www.dhhs.nh.gov/dphs/cdpc/asthma/publications.htm](http://www.dhhs.nh.gov/dphs/cdpc/asthma/publications.htm)

**Figure 6.1**  
**Annual number of deaths with asthma as the underlying and contributing cause of death - New Hampshire, 2000-2006**



Data Source: 2000-2006 New Hampshire Vital Records, Mortality Data

### Asthma as an Underlying and Contributing Cause of Death:

- Between 2000 and 2006, there were an average of 15 deaths per year in New Hampshire for which asthma was the *underlying* cause. There were also on average an additional 24 deaths with asthma listed as a *contributing* cause and something other than asthma as the underlying cause.
- From 2000 to 2006, the majority of deaths (41.3%) with asthma listed as a *contributing* cause had an *underlying* cause of death related to the circulatory system (i.e., heart disease). See Table 6.1 below for a list of *underlying* causes of death where asthma was listed as a *contributing* cause of death.

**Table 6.1**  
**Number and percent of deaths with asthma listed as the contributing cause, by underlying cause of death - New Hampshire 2000 to 2006**

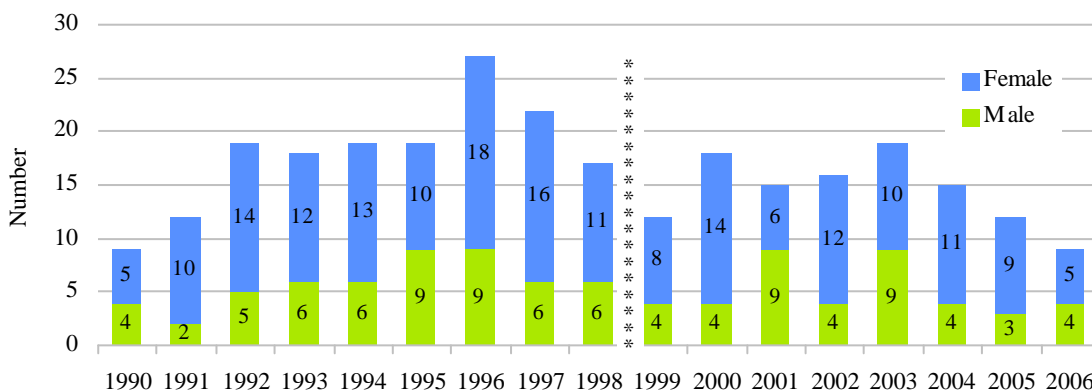
ICD-10 group codes	Underlying cause of death	Number	Percent
A00-B99	Certain infectious and parasitic diseases	6	3.6
C00-D48	Neoplasms	35	21.0
E00-E99	Endocrine, nutritional and metabolic diseases	9	5.4
F00-F99	Mental and behavioral disorders	1	0.6
G00-G99	Diseases of the nervous system	13	7.8
I00-I99	Diseases of the circulatory system	69	41.3
J00-J99	Diseases of the respiratory system	6	3.6
K00-K99	Diseases of the digestive system	16	9.6
M00-M99	Diseases of the musculoskeletal system and connective tissue	6	3.6
N00-N99	Diseases of the genitourinary system	1	0.6
Q00-Q99	Congenital malformations, deformations and chromosomal abnormalities	3	1.8
X40-X49	Accidental poisoning by and exposure to noxious substances	2	1.2
Total		167	100

Notes: Deaths that had both an asthma underlying and contributing cause of death were excluded from analysis.

Data Source: 2000-2006 New Hampshire Vital Records, Mortality Data

See Table 6.4 at the end of the Asthma Mortality section for the data presented in Figure 6.1.

**Figure 6.2**  
**Annual number of deaths with asthma as underlying cause, by gender - New Hampshire, 1990-2006**



\*Cause of death coding converted from ICD-9 to ICD-10 in 1999.  
 Data Source: 1990-2006 New Hampshire Vital Records, Mortality Data

**Asthma as an Underlying Cause of Death by Gender:**

- A total of 278 New Hampshire residents died due to asthma from 1990 to 2006.
- Approximately 66% (184) of all deaths from 1990 to 2006 were among female residents.
- On average, from 1999 to 2006, there were 1.61 more asthma deaths among females as compared to males in New Hampshire. Nationally, there were 1.75 more asthma deaths among females as compared to males in 2004.<sup>1</sup>

Notes: The comparability ratio for asthma was not applied to New Hampshire data on annual death counts in order to present the actual number of deaths that occurred each year. As a result, any change in the number of deaths due to asthma should be interpreted with caution. In addition, it is inappropriate to look for trends using this graph because the number of deaths is plotted and not the rate of deaths, which takes into account changes in population size.

See Table 6.5 at the end of the Asthma Mortality section for the data presented in Figure 6.2.

1. Moorman JE, Rudd RA, Johnson CA et al. Centers for Disease Control and Prevention. National Surveillance for Asthma - United States, 1980-2004. MMWR Surveillance Summaries 2007, 56 (No. SS-8).

**Table 6.2**  
**Three-year age-adjusted mortality rates\* with asthma as underlying cause of death**  
**New Hampshire and United States, 1992-2006**

	1992-1994	1995-1997	1998-2000	2001-2003	2004-2006
<b>New Hampshire</b>					
Number of deaths	56	68	47	50	36
Adjusted number of deaths †	50	61	45	50	36
<b>Rate*</b>	<b>16.4</b>	<b>18.3</b>	<b>12.8</b>	<b>13.1</b>	<b>9.3</b>
95% CI	12.2 - 21.6	14.0 - 23.5	9.3 - 17.1	9.8 - 17.3	6.5 - 12.8
<b>United States</b>					
Number of deaths	15,616	16,736	14,582	12,628	
Adjusted number of deaths †	13,958	14,959	14,004	12,628	Data Not Available
<b>Rate*</b>	<b>19.0</b>	<b>19.3</b>	<b>17.2</b>	<b>14.7</b>	
95% CI	18.4 - 19.6	18.7 - 19.9	16.6 - 17.8	14.2 - 15.2	

\*Rates are per 1,000,000 NH residents and age-adjusted to the 2000 US standard population. Comparability ratio applied to account for coding conversion from ICD-9 to ICD-10 in 1999.

† Based on comparability ratio.

Data Source: 1992-2006 New Hampshire Vital Records, Mortality Data and CDC Wonder

**Table 6.3**  
**Five-year mortality rates\* with asthma as the underlying cause**  
**by gender and age - New Hampshire 1992-2006**

	1992-1996	1997-2001	2002-2006
<b>Gender</b>			
<b>Males</b>			
Number of deaths	35	29	24
Adjusted number of deaths †	31	28	24
<b>Rate*‡</b>	<b>13.8</b>	<b>10.9</b>	<b>8.4</b>
95% CI	9.4 - 19.6	7.2 - 15.8	5.4 - 12.5
<b>Females</b>			
Number of deaths	67	55	47
Adjusted number of deaths †	60	52	47
<b>Rate*‡</b>	<b>19.9</b>	<b>15.3</b>	<b>12.0</b>
95% CI	15.2 - 25.6	11.4 - 20.0	8.8 - 15.9
<b>Age</b>			
0-4			
Number of deaths	0	0	0
Adjusted number of deaths †	0	0	0
<b>Rate*</b>	-	-	-
95% CI	N/A	N/A	N/A
5-14			
Number of deaths	2	0	2
Adjusted number of deaths †	2	0	2
<b>Rate*</b>	-	-	-
95% CI	N/A	N/A	N/A
15-34			
Number of deaths	3	4	7
Adjusted number of deaths †	3	4	7
<b>Rate*</b>	-	-	-
95% CI	N/A	N/A	N/A
35-64			
Number of deaths	39	28	17
Adjusted number of deaths †	34	27	17
<b>Rate*</b>	<b>15.8</b>	<b>10.6</b>	-
95% CI	10.9 - 22.1	7.0 - 15.5	N/A
65+			
Number of deaths	59	52	45
Adjusted number of deaths †	53	49	45
<b>Rate*</b>	<b>79.6</b>	<b>67.6</b>	<b>56.3</b>
95% CI	59.6 - 104.2	50.1 - 89.3	41.1 - 75.4

\*Rates are per 1,000,000 NH residents. Comparability ratio applied to account for coding conversion from ICD-9 to ICD-10 in 1999.

† Based on comparability ratio.

‡ Rates are age-adjusted to the 2000 US standard population.

Data Source: 1992-2006 New Hampshire Vital Records, Mortality Data

### Findings from Table 6.2- asthma mortality rates for New Hampshire versus the United States:

- There are no statistically significant differences between national asthma mortality rates and New Hampshire's rates.
- From 1992-1994 to 2004-2006, there was a decrease in the number and rate of asthma deaths in New Hampshire; however, due to the small number of asthma deaths, we are unable to determine if there is a statistically significant difference between these two time periods.
- Nationally, there was a statistically significant decline in asthma mortality rates from 1992-1994 to 2001-2003.

### Findings from Table 6.3 for asthma mortality rates by gender and age:

#### *Gender*

- Among both males and females the rate of asthma deaths has decreased over time; however, due to small numbers we are unable to determine if this is a statistically significant decline.
- Nationally the rates of asthma deaths are higher among females than males<sup>1</sup>; due to the small number of asthma deaths that occur in New Hampshire, no statistically significant difference can be seen by gender.
- The difference between the rate of asthma deaths among females and males has decreased over time in New Hampshire. For 1992-1996, the difference between the rates was 6.1 percentage points and for 2002-2006 it was 3.6 percentage points.

#### *Age*

- Age-specific asthma mortality rates for New Hampshire residents are calculated for only the two oldest age groups due to the small number of deaths among persons less than 35 years of age.
- Among adults 35-64 and 65+ years old the rate of asthma deaths has decreased over time; however, due to small numbers we are unable to determine if this is a statistically significant decline. Nationally there was a general decline in asthma deaths among these groups.<sup>1</sup>
- In 2002-2006, because fewer than 20 asthma deaths occurred among adults 35-64 years old, the rate of asthma deaths was not calculated because the estimate would not be considered stable - please see Appendix B Technical Notes for further explanation.
- The majority of asthma deaths for 2002-2006 (63.4%) occurred among adults who were 65 years old and older.

1. Moorman JE, Rudd RA, Johnson CA et al. Centers for Disease Control and Prevention. National Surveillance for Asthma - United States, 1980-2004. MMWR Surveillance Summaries 2007, 56 (No. SS-8).

## Supporting Tables

**Table 6.4**  
**Annual number of deaths with asthma as the underlying and contributing cause of death - New Hampshire, 2000-2006**  
 [Figure 6.1]

	Underlying	Contributing	Total asthma related deaths
<b>2000</b>	18	24	42
<b>2001</b>	15	26	41
<b>2002</b>	16	29	45
<b>2003</b>	19	19	38
<b>2004</b>	15	21	36
<b>2005</b>	12	27	39
<b>2006</b>	9	21	30

Data Source: 2000-2006 New Hampshire Vital Records, Mortality Data

**Table 6.5**  
**Annual number of deaths with asthma as underlying cause of death by gender - New Hampshire, 1990-2006**  
 [Figure 6.2]

	Male	Female	Total
<b>1990</b>	4	5	9
<b>1991</b>	2	10	12
<b>1992</b>	5	14	19
<b>1993</b>	6	12	18
<b>1994</b>	6	13	19
<b>1995</b>	9	10	19
<b>1996</b>	9	18	27
<b>1997</b>	6	16	22
<b>1998</b>	6	11	17
<b>1999</b>	4	8	12
<b>2000</b>	4	14	18
<b>2001</b>	9	6	15
<b>2002</b>	4	12	16
<b>2003</b>	9	10	19
<b>2004</b>	4	11	15
<b>2005</b>	3	9	12
<b>2006</b>	4	5	9

Data Source: 1990-2006 New Hampshire Vital Records, Mortality Data



**Notes**

A Publication of the  
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