Asthma in New Jersey

Chapter 7: Mortality

The New Jersey Department of Health and Senior Services (NJDHSS) monitors asthma deaths and asthma related deaths using the annual Multiple Cause-of-Death files maintained by the New Jersey Center for Health Statistics (NJCHS). Files are compiled from death certificates that have been registered for New Jersey residents. New Jersey law requires that a death certificate be completed by the appropriate authority when a death occurs in the State and information about out of State deaths is acquired through participation in the national Vital Statistics Cooperative Program.\(^1\) Reporting is considered to be about 99% complete for deaths occurring in the United States.\(^2\)

Asthma Deaths

In this report, an asthma death is defined as one with an underlying cause in the ICD-10 code range J45-J46 (1999-present) or the ICD-9 code range 493.0-493.9 (1989-1998).

Figure 1

Average Annual Crude Asthma Death Rate per Million Population by Age Group, New Jersey, 2003-2006

Data Source – NJ Multiple Cause of Death Files, 2003-2006
Death from asthma is relatively uncommon. The number of asthma deaths during 2003-2006 ranged from 104 to 113 per year and the average annual asthma death rate during this time period was about 12.5 deaths per million residents. Rates could not be calculated for children alone due to a small number of asthma deaths. Rates increased with increasing age and the highest rate was found among residents aged 85 years and older (114.3 asthma deaths per million residents). Although death rates were substantially higher among the oldest age group, the number of asthma deaths was distributed more evenly across age groups with the highest number actually occurring among residents 45-54 years of age (18% of all asthma deaths).
The asthma death count among New Jersey residents appears to vary by age group and month of death. Given the relatively small number of asthma deaths, even after combining several years of data, monthly figures should be interpreted with caution. Nonetheless, mortality patterns do seem to support the existence of age specific seasonal patterns and this observation is consistent with observations on the national level.²
Table 3
Contributing Causes* of Asthma Death, New Jersey, 2003-2006

<table>
<thead>
<tr>
<th>Contributing Cause (ICD-10)(^5)</th>
<th>Number of Asthma Deaths</th>
<th>Percent of Asthma Deaths</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diseases of the heart (I00-I09, I11, I13, I20-I51)</td>
<td>136</td>
<td>31.6%</td>
</tr>
<tr>
<td>Chronic lower respiratory diseases excluding asthma (J40-J44, J47)</td>
<td>77</td>
<td>17.9%</td>
</tr>
<tr>
<td>Essential hypertension and hypertensive renal disease (I10, I12, I15)</td>
<td>52</td>
<td>12.1%</td>
</tr>
<tr>
<td>Diabetes mellitus (E10-E14)</td>
<td>43</td>
<td>10.0%</td>
</tr>
<tr>
<td>Influenza and pneumonia (J10-J18)</td>
<td>41</td>
<td>9.5%</td>
</tr>
<tr>
<td>Septicemia (A40-41)</td>
<td>17</td>
<td>3.9%</td>
</tr>
<tr>
<td>Accidents - unintentional injuries (V01-X59, Y85-Y86)</td>
<td>14</td>
<td>3.2%</td>
</tr>
<tr>
<td>Nephritis, nephrotic syndrome and nephrosis (N00-N07, N17-N19, N25-N27)</td>
<td>10</td>
<td>2.3%</td>
</tr>
<tr>
<td>Cerebrovascular diseases (I60-I69)</td>
<td>10</td>
<td>2.3%</td>
</tr>
<tr>
<td>Malignant neoplasm (C00-C97)</td>
<td>7</td>
<td>1.6%</td>
</tr>
</tbody>
</table>

*Considered only those causes designated by the National Center for Health Statistics as being rankable\(^6\)

A total of 431 asthma deaths were reported during 2003-2006
Data Source – NJ Multiple Cause of Death Files, 2003-2006
Contributing causes J45-J46 (asthma) were excluded
Causes associated with ≤5 deaths are not presented

Reporting officials may list up to 20 contributing diagnoses of death in addition to the underlying cause of death. A total of 852 contributing diagnostic codes were reported for the 431 asthma deaths that occurred from 2003-2006. Considering only those diagnoses represented in the National Center for Health Statistics’ (NCHS) list of rankable causes of death\(^6\), the most common contributing causes associated with asthma death are summarized in Table 3. Considering those diagnoses that are excluded from the NCHS’ list, the following additional contributing causes of asthma death were also noted:

- Mental and behavioral disorders due to use of tobacco (F17) was listed as a contributing cause for 54 (12.5%) of asthma deaths
- Mental and behavioral disorders due to psychoactive substance use other than tobacco (F10-F16, F18, F19) was listed as a contributing cause for 19 (4.4%) of asthma deaths
- Obesity (E66) was listed as a contributing cause for 13 (3.0%) of asthma deaths
- Organic, including symptomatic, mental disorders (F00-F09) was listed as a contributing cause for 11 (2.6%) of asthma deaths.
During 2000-2006, the annual age adjusted asthma death rate was generally higher among women when compared to men.
Figure 5

Distribution of Asthma Deaths by Gender, New Jersey, 2000-2006

About 64% of the asthma deaths that occurred from 2000-2006 were among women.

Figure 6

Age Adjusted* Asthma Death Rate per Million Population by Race, New Jersey, 2000-2006

*Direct method of age adjustment using the 2000 U.S. standard population
Data Source – NJ Multiple Cause of Death Files, 2000-2006
Population Source – July 1st resident population estimates from bridged-race estimates (vintage 2008)
Table 5
Number of Asthma Deaths and Age Adjusted* Asthma Death Rate by Race, New Jersey, 2000-2006

<table>
<thead>
<tr>
<th>Year</th>
<th>Black, Non-Hispanic</th>
<th>Number of Deaths</th>
<th>Rate per Million Standard Population</th>
<th>95% CI</th>
<th>White, Non-Hispanic</th>
<th>Number of Deaths</th>
<th>Rate per Million Standard Population</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>34</td>
<td>36.0</td>
<td>23.9 – 48.1</td>
<td></td>
<td>2000</td>
<td>55</td>
<td>7.8</td>
<td>5.7 – 9.9</td>
</tr>
<tr>
<td>2001</td>
<td>51</td>
<td>47.6</td>
<td>34.5 – 60.6</td>
<td></td>
<td>2001</td>
<td>58</td>
<td>8.4</td>
<td>6.2 – 10.6</td>
</tr>
<tr>
<td>2002</td>
<td>40</td>
<td>37.2</td>
<td>25.6 – 48.7</td>
<td></td>
<td>2002</td>
<td>52</td>
<td>7.3</td>
<td>5.3 – 9.3</td>
</tr>
<tr>
<td>2003</td>
<td>39</td>
<td>36.3</td>
<td>24.9 – 47.7</td>
<td></td>
<td>2003</td>
<td>56</td>
<td>8.4</td>
<td>6.2 – 10.5</td>
</tr>
<tr>
<td>2004</td>
<td>33</td>
<td>31.7</td>
<td>20.9 – 42.5</td>
<td></td>
<td>2004</td>
<td>56</td>
<td>7.8</td>
<td>5.8 – 9.9</td>
</tr>
<tr>
<td>2005</td>
<td>32</td>
<td>29.6</td>
<td>19.4 – 39.9</td>
<td></td>
<td>2005</td>
<td>66</td>
<td>9.9</td>
<td>7.5 – 12.2</td>
</tr>
<tr>
<td>2006</td>
<td>36</td>
<td>32.7</td>
<td>22.0 – 43.3</td>
<td></td>
<td>2006</td>
<td>52</td>
<td>7.8</td>
<td>5.7 – 9.9</td>
</tr>
</tbody>
</table>

*Direct method of age adjustment using the 2000 U.S. standard population
Data Source – Data Source – NJ Multiple Cause of Death Files, 2000-2006
Population Source – July 1st resident population estimates from bridged-race estimates (vintage 2008)

During 2000-2006, the annual age adjusted asthma death rate was considerably higher among black, non-Hispanic residents as compared to white, non-Hispanic residents each year. Because the number of asthma deaths is relatively small, it is not possible to report annual rates for many groups including the Hispanic, American Indian or Alaska Native, Native Hawaiian or other Pacific Islander, and Asian populations.

The 2004-2006 average annual age adjusted asthma death rate for Hispanic residents was 12.4 deaths per million population (95% CI: 8.0-16.8) as compared to 31.3 deaths per million population (95% CI: 25.2-37.4) for black, non-Hispanic residents and 8.5 deaths per million population (95% CI: 7.2-9.7) for white, non-Hispanic residents during the same time period. Data for Hispanics should be interpreted with caution since national data suggests asthma age adjusted death rates are much higher among Hispanics of Puerto Rican descent when compared to Hispanics of Cuban and Mexican descent. In New Jersey, Hispanic adults are about 27% Puerto Rican, 12% Mexican, 6% Cuban, 12% Dominican, 37% Central American or South American, and 5% other Hispanic or Latino.

Figure 7
Distribution of Asthma Deaths by Race/Ethnicity, New Jersey, 2000-2006

Data Source – NJ Multiple Cause of Death Files, 2000-2006
The distribution of asthma deaths from 2000-2006 shows that about 52% were among white, non-Hispanic residents, about 34% were among black, non-Hispanic residents, and about 11% were among Hispanic residents. In contrast, about 63% of state residents were white, non-Hispanic, about 13% of state residents were black, non-Hispanic, and about 16% of state residents were Hispanic in 2006.\textsuperscript{10}

**Asthma Related Deaths**

In this report, an asthma related death is defined as a non-asthma death with a contributing asthma cause in the ICD-10 code range J45-J46 (1999-present) or the ICD-9 code range 493.0-493.9 (1989-1998).

**Figure 8**

**Distribution of Asthma Related Deaths by Age Group, New Jersey, 2003-2006**

A total of 575 asthma related deaths were reported during 2003-2006
Data Source – NJ Multiple Cause of Death Files, 2003-2006

The number of asthma related deaths during 2003-2006 ranged from 135 to 154 per year with a total of 575 asthma related deaths among residents during the four years, which is about 33% higher than the number of asthma deaths (431) during the same time period. The distribution of asthma related deaths by age group is shown in Figure 8. Although the highest number of asthma related deaths (23%) was among the oldest age group of residents (85+ years), about 40% of asthma related deaths during 2003-2006 occurred among residents younger than 65 years of age (236 deaths).
Table 6
Underlying Causes* of Asthma Related Deaths, New Jersey, 2003-2006

<table>
<thead>
<tr>
<th>Underlying Cause (ICD-10)(^5)</th>
<th>Number of Asthma Related Deaths</th>
<th>Percent of Asthma Related Deaths</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diseases of the heart (I00-I09, I11, I13, I20-I51)</td>
<td>229</td>
<td>39.8%</td>
</tr>
<tr>
<td>Malignant neoplasm (C00-C97)</td>
<td>73</td>
<td>12.7%</td>
</tr>
<tr>
<td>Accidents - unintentional injuries (V01-X59, Y85-Y86)</td>
<td>37</td>
<td>6.4%</td>
</tr>
<tr>
<td>Diabetes mellitus (E10-E14)</td>
<td>35</td>
<td>6.1%</td>
</tr>
<tr>
<td>Cerebrovascular diseases (I60-I69)</td>
<td>16</td>
<td>2.8%</td>
</tr>
<tr>
<td>Human immunodeficiency virus (HIV) disease (B20-B24)</td>
<td>14</td>
<td>2.4%</td>
</tr>
<tr>
<td>Essential hypertension and hypertensive renal disease (I10, I12, I15)</td>
<td>10</td>
<td>1.7%</td>
</tr>
<tr>
<td>Septicemia (A40-A41)</td>
<td>12</td>
<td>2.1%</td>
</tr>
<tr>
<td>Chronic lower respiratory diseases excluding asthma (J40-J44, J47)</td>
<td>12</td>
<td>2.1%</td>
</tr>
<tr>
<td>Alzheimer's disease (G30)</td>
<td>8</td>
<td>1.4%</td>
</tr>
<tr>
<td>Influenza and pneumonia (J10-J18)</td>
<td>6</td>
<td>1.0%</td>
</tr>
</tbody>
</table>

*Considers only those causes designated by the National Center for Health Statistics as being rankable\(^6\)
A total of 575 asthma related deaths were reported during 2003-2006
Data Source – NJ Multiple Cause of Death Files, 2003-2006
Includes deaths with at a contributing cause of J45-J46 (asthma)
Causes associated with ≤ 5 deaths are not presented

Considering only those diagnostic codes represented in the NCHS’ list of rankable causes of death\(^6\), the most common underlying causes associated with asthma related death in 2003-2006 are summarized in Table 6. Considering those diagnostic codes that are excluded from the NCHS list, the following was also noted:

- Obesity (E66) was listed as the underlying cause for 15 (2.6%) of asthma related deaths during this time period.

______________________________________________
______________________________________________

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**Acronyms:**

ICD – International Classification of Diseases

CI – Confidence Interval

**Definitions:**

**Confidence Interval** – A range of values within which the actual value is likely to fall

**Crude Death Rate** – The number of deaths divided by the number of people at risk for the time period noted. Those presented here are multiplied by a million for expression as a whole number

**Age-Adjusted Death Rate** – A hypothetical death rate that facilitates comparison among populations that differ in underlying age structure. The age-adjusted death rates presented here were calculated with the direct method of age adjustment using the 2000 U.S. standard population.

**Underlying Cause of Death** – “The disease or injury which initiated the train of morbid events leading directly to death, or the circumstances of the accident or violence which produced the fatal injury.” \(^{11}\)

**Contributing Causes of Death** – “Other significant conditions contributing to the death, but not related to the disease or conditions causing it.” \(^{11}\)

**ICD** – “A coding system maintained by the World Health Organization and the U.S. National Center for Health Statistics used to classify causes of death on death certificates and diagnoses, injury causes, and medical procedures for hospital and emergency department visits. These codes are updated every decade or so to account for advances in medical technology.” \(^{12}\)

**References:**


Acknowledgements:

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www.nj.gov/health/asthma

For asthma resources from the Pediatric Adult Asthma Coalition of New Jersey (PACNJ):
www.pacnj.org

For more information about New Jersey Mortality Data:
http://www4.state.nj.us/dhss-shad/query/DeathQueryTechNotes.html

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