# Asthma Mortality: A Review

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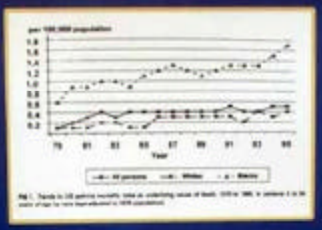
## Background

It is estimated that 17 million people in the United States have asthma. The prevalence of asthma in all age groups is 4.62 per 100 persons, but is higher in those under 18 (6.12/100 persons) and those with an income less than $10,000 (6.6 /100 persons).

Asthma is a complex, heterogeneous disease, in which response to treatment varies widely. Numerous factors including viral infections, allergen and irritant exposure, and exercise are among the items that can complicate the short- and long-term management of asthma.

Despite intense research and advances in therapy, the morbidity and mortality of asthma remains relatively high. There is little information available that links specific risk factors to high-risk populations and mortality data.

This review of published literature focuses on three key areas:
1) Examination of current **trends** in rates of asthma-related deaths
2) Identification of mortality predictors or **risk** factors
3) Detection of potential effective **prevention** measures




**In Memory of Matthew Wayne Banacki**
**Who died on August 29, 2000 following an acute asthma attack**

April 7, 1981 – August 29, 2000

## Review

**Trends**
- In the United States, mortality rates from asthma have increased in the past two years: from 1.3 to 1.9 per 100,000 persons.
- Recent asthma mortality trends indicate a widening of the racial gap. [See Figure 1.]
- Rates of deaths from asthma have been much higher for white females than white males with an increasing disparity.
- The US increases in prevalence of asthma and mortality from asthma may reflect worldwide trends.
- Within the US, regional variations also exist in asthma prevalence, morbidity, and mortality rates.
- Case-fatality rates are highest for black men in inner cities.

**Risk**
The "high-risk" profile for fatal or near-fatal asthma includes suboptimal pharmacotherapy in conjunction with severe disease, psychologic dysfunction, black race or Hispanic ethnicity, and residence in an urban area with a high concentration of poverty. Specific disease characteristics that may place patients at risk are inadequately defined. Most deaths do occur either 1) in patients with severe, poorly controlled asthma whose condition gradually deteriorates over days or 2) in patients who have a history of unstable illness and are perinally responsive to treatment, upon which a major attack is superimposed. Rarely, deaths are rapid and unexpected: "sudden-onset fatal asthma".

The literature notes that the events most often associated with fatal or near-fatal episodes of asthma are:
- Extreme emotional distresses
- Air pollution
- Therapeutic problems
- Poor assessment of the seriousness of the final episode

Poor assessment of the seriousness is considered the most significant. Several studies have shown a pattern of failure on the part of either the patient or health care provider to recognize the severity of the final episode of asthma. One British panel reviewing asthma-related deaths found that some aspect of care or supervision was deficient in 46% of the deaths reviewed. The problems ranged from failure to diagnose asthma (18%) to gross undertreatment (11%). Patients had not acted appropriately (7% of the time. Other investigators looking into asthma-related deaths found very similar patterns.

Many believe that deaths from asthma usually occur suddenly at home or at work, suggesting that even if the seriousness were recognized, the deaths would not have been preventable. In actuality, the final episode in nearly 80% of the deaths lasted at least 12 hours, allowing enough time for treatment. Slightly less than half of all deaths occur in the hospital.

Since asthma episodes can be successfully managed, asthma-related deaths in hospitals may be due to the care. Many studies have shown inadequate or incomplete assessments of patients with asthma in both outpatient and inpatient settings, especially in persons who died. Using their clinical judgement, practitioners often underestimate the medical potential of the attack.

**Prevention**
- The use of appropriate medications is key and dependent on the ability of caregivers and patients to recognize the danger signs. Anti-inflammatory agents are required in any patient with active disease.
- The patient must be educated about the disease and have a written plan for emergencies.
- Objective assessment and close communication between physician and patient during periods of decompensation are essential.
- In emergency situations, there is need for a protocol to be established and implemented that incorporates effective drugs and serial measurement of the patient's progress.
- Clinical evaluations should be second to findings from objective monitoring of the severity of obstruction and associated abnormalities in gas exchange.
- Every exacerbation of asthma that lasts more than a few days should be assumed to be potentially fatal and acted on accordingly.
- Every effort should be made to prevent new attacks. Long-term objective monitoring of lung function with preventive changes in treatment is critical.
- Patients not responding to primary care physician measures should be identified early and referred to subspecialists for further management.

## Conclusion

**In conclusion –**

- Asthma mortality rates have increased worldwide and in the US.
- Although rates differ markedly by region and ethnicity, disease characteristics that place patients at risk remain inadequately defined.
- Physician and patient actions are key to the prevention of asthma-related deaths.
- Further research is needed in several areas including:
  - Specific disease characteristics that place asthma patients at risk for asthma-related death.
  - Primary care physician adherence to asthma management guidelines.
  - Emergency situation asthma protocol.