Asthma Deaths at Home are Unchanged Despite Declining Mortality in Other Settings: US Death Certificate Data From 2000–2019

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Background & Rationale
- Declining rates of asthma mortality in the United States (US) have been reported
- Trends in asthma mortality by place of death (inpatient, outpatient, home), however, have not been evaluated, which could shed light on the issues related to access to healthcare and patient/carer/ symptom recognition
- This study aims to describe temporal trends in asthma deaths by place of death in the US and provides a contemporary snapshot of these trends across demographic factors using census data from the US Centers for Disease Control and Prevention (CDC)

Methods
Data Sources
- The CDC WONDER database provides national mortality and population data produced by CDC’s National Center for Health Statistics
- Mortality data are collected by state registries and provided to the National Vital Statistics System
- Data are based on death certificates for US residents, and each death certificate contains a single underlying cause of death and demographic data
- The number of deaths and death rates can be obtained by place of residence, age, race, Hispanic ethnicity, sex, place of death, and cause of death (4-digit ICD-10 codes)

Analysis
- Deaths with asthma as the underlying cause of death and place of death were identified in the CDC WONDER database using the ICD-10 code J45 (including all subcodes) during 2000–2019
- Place of death categories included the following: (1) Decedent’s Home; (2) Medical Facility – Inpatient; (3) Medical Facility – On-Call; (4) Medical Facility – Outpatient; (5) Medical Facility – Inpatient, (6) Medical Facility – Other (includes Medical facility - Status Unknown; Hospice Facility, and Nursing Home, long-term Care); and (7) Other/Unknown
- Asthma mortality rates were calculated by applying the death counts to US Census Bureau mid-year population estimates for each year

Results
Asthma Mortality Rates by Place of Death
- Overall, 67,895 deaths with asthma as the underlying cause were registered in the US over the 20-year period, and an overall 32% decline in asthma mortality was observed (1.43 to 0.98 per 100,000 from 2000 to 2019, respectively)
- While asthma mortality rates declined in all medical facilities, the mortality rate for asthma deaths occurring at home remained relatively stable (0.32 to 0.34 per 100,000 persons in 2000 to 2019, respectively) (Figure 1)

Key Takeaways
- Despite an overall decline in asthma mortality in the US, the rate of asthma deaths occurring at home has remained stable
- In the most recent data, more than one-third of asthma deaths in the US occurred at home and not in a medical facility, and the proportion varied by age, race, Hispanic ethnicity, and geographic/metropolitan region
- These findings warrant further research regarding the reasons for asthma death by location, overall and by various sociodemographic factors

Figure 1. Crude Asthma Mortality Rate per 100,000 Persons by Place of Death and Calendar Year (2000–2019)

Figure 2. Distribution of Asthma Deaths by Place of Death per Calendar Period (2000–2019)

Results (continued)
Distribution of Place of Asthma Deaths
- As a proportion of all asthma deaths, deaths at home increased from 23.2% in 2000–2001 to 35.9% in 2018–2019, while the proportion of deaths occurring in medical facilities declined (Figure 2)

Figure 3. Distribution of Asthma Deaths by Place of Death (2019–2020)

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References