

Title: cardiac causes are an overestimated underlying cause of out-of-hospital sudden unexpected death

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Topic: Sudden Cardiac Death

Category: Prevention, Epidemiology & Population Science (PEP)

Background/Introduction:

Current literature estimates nearly 75% of all sudden deaths are cardiac, and most prevention strategies target cardiac risk factors. However, time restrictive definitions of out-of-hospital sudden unexpected death (OHSUD) and unreliable death certificate data may lead to overestimates of the prevalence of cardiac causes, diverting resources from other aetiologies.

Purpose:

This study aims to use an epidemiological approach to better define OHSUD and understand its underlying aetiologies in order to improve prevention strategies.

Methods:

We studied a population-based sample of out-of-hospital sudden unexpected deaths amongst 18-64 year-old residents of Wake County, North Carolina. Over 12 months, 1138 Wake County Emergency Medical Services referrals were screened using medical records, medical examiner reports, and death certificates, identifying 187 OHSUD cases. Three board-certified cardiologists independently adjudicated these cases and determined the underlying cause of death. There were no restrictions on the timing of death for inclusion. The sample was 62% male, 60% Caucasian, 60% unmarried, and 82% > age 45.

The electronic death certificates were compared to the adjudicators' underlying cause of death. Cases were then analysed according to World Health Organization (WHO) criteria for sudden unexpected death. WHO criteria are defined as sudden death either witnessed or un-witnessed occurring no more than 24 hours after the subject was last seen alive and free of symptoms. The Non-WHO group consisted of subjects who did not meet the WHO criteria.

Results:

Compared to death certificates, adjudication resulted in a lower rate of cardiac causes of death for all cases (51.34% vs 33.16%, $p < 0.001$). The concordance between electronic death certificates and adjudicators was fair, the kappa statistic of agreement reaching 0.22 (95% CI, 0.087 to 0.35). Adjudicated cause of death was cardiac in 25.78% of the Non-WHO cases, compared to 49.15% of cases defined by WHO criteria ($p = 0.002$). Using only death certificate cause of death, 50% of Non-WHO cases were cardiac in origin, compared with 54% in the WHO restricted cohort ($p = 0.638$).

Conclusion(s):

In middle-aged out-of-hospital sudden unexpected death victims, death certificates and time-limiting definitions may overestimate the prevalence of cardiovascular disease as the underlying cause of death. Therefore, overestimating a cardiac cause of death may potentially divert necessary resources and prevention efforts from other important causes of death.