

**HOSPITAL ADMISSION, CASE FATALITY
AND MORTALITY RATES: MYOCARDIAL
INFARCTION STUDIES – SUMMARY**

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UNIT OF HEALTH-CARE EPIDEMIOLOGY

UNIVERSITY OF OXFORD

REPORT MR8



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MYOCARDIAL INFARCTION STUDIES**

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Summary of objectives

The aim of producing this report was to bring together the results of studies completed by NCHOD about the most robust methods for calculating for acute myocardial infarction (AMI):

- Case-fatality rates (CFR).
- Population-based mortality measures.
- Incidence measures.

Abstract

Case fatality rate

It is proposed that to calculate a 'basic' CFR for AMI the following should be noted:

- For the number of admissions to be used as denominator:
 - continuous in-patient spell to be counting unit
 - only emergency admissions to be included
 - diagnostic code to be used I21 in ICD 10
 - diagnostic code to be included if appearing as principal diagnosis.
- For the number of deaths to be used as numerator:
 - source of data to be death certification
 - all causes of death to be included not just AMI either as underlying cause or mention anywhere on the certificate
 - location of death to be anywhere not solely hospital
 - time interval from admission to death to be 30 days.
- For comparative review CFRs should be age standardised and presented separately for each sex.
- Given current admission rates to a hospital of typical size, annual information will only detect differences between hospitals for a relative risk of 1.5. Information will probably need to be calculated for three-year periods to provide useful comparisons.

The most clinically relevant way of compiling CFRs for comparative hospital performance is probably to start with the basic CFR and then exclude:

- admissions misdiagnosed as AMI
- deaths occurring on day 0.

Whilst gaining understanding, it is useful to compare CFRs calculated as:

- basic CFR
- basic CFR less misdiagnosed admissions
- basic CFR less misdiagnosed admissions and deaths occurring on day 0.

Population based mortality

It is proposed that to calculate a 'basic' population-based mortality rate for AMI the following should be noted:

- ICD codes to be used I21 and I22 in ICD 10.
- As there were few deaths for which AMI was not the underlying cause, diagnosis could be either underlying cause or mention anywhere on the certificate. However, a calculation using AMI as underlying cause is to be preferred.
- Rates should be age standardised and presented separately for each sex.

The preferred way of presenting population-based mortality rates is to show deaths in hospital and outside hospitals separately.

Incidence measures

It is proposed that to calculate a 'basic' admission-based incidence rate for AMI the following should be noted:

- Multiple admissions in the year account for only a small proportion of total admissions so person-based data add little extra information.
- Rates should be age standardised and presented separately for each sex.

It should be noted that hospital admissions and the deaths outside hospital contributed most to the overall incidence of AMI.

The preferred way of calculating incidence is thus to:

- include hospital admissions and deaths outside hospital
- exclude admissions occurring within 30 days of a previous admission, as these are commonly attributed to being associated with the initial admission.

Conclusion

These studies using linked HES/mortality data show the difficulties of calculating AMI outcome indicators and interpreting what the comparative information derived from them means. From these studies it is clear that to compare hospital performance using a single indicator of AMI case fatality rates will be unhelpful and, in many cases, misleading.

These studies have not addressed the important issue of the use of troponins as a diagnostic test. This change, which is being implemented in an increasing number of hospitals, is also having major effects on the interpretation of comparative information about acute myocardial infarction.