

Variation in Heart Attack Mortality in Canada

Cardiovascular disease remains the leading cause of death and emergency hospital admission in Canada, but some parts of the picture are changing. For example, Canadians are less likely to be admitted to hospital with a heart attack than in the past and those hospitalized are more likely to survive the event (Canadian Institute for Health Information 2006a). These overall trends, however, mask significant variations across the country. For instance, the latest data show a two-fold difference in risk-adjusted mortality rates from region to region.

This paper highlights key findings from a recent CIHI report, *Health Care in Canada 2006*. This report builds on previous research related to cardiac mortality (Tu et al. 1999) and regional data for 23 key indicators, including new trend information for 30-day in-hospital mortality rates for patients admitted with a new heart attack (Canadian Institute for Health Information 2006b). The report also presents new analyses aimed at understanding why some patients are more likely to survive a heart attack than others.

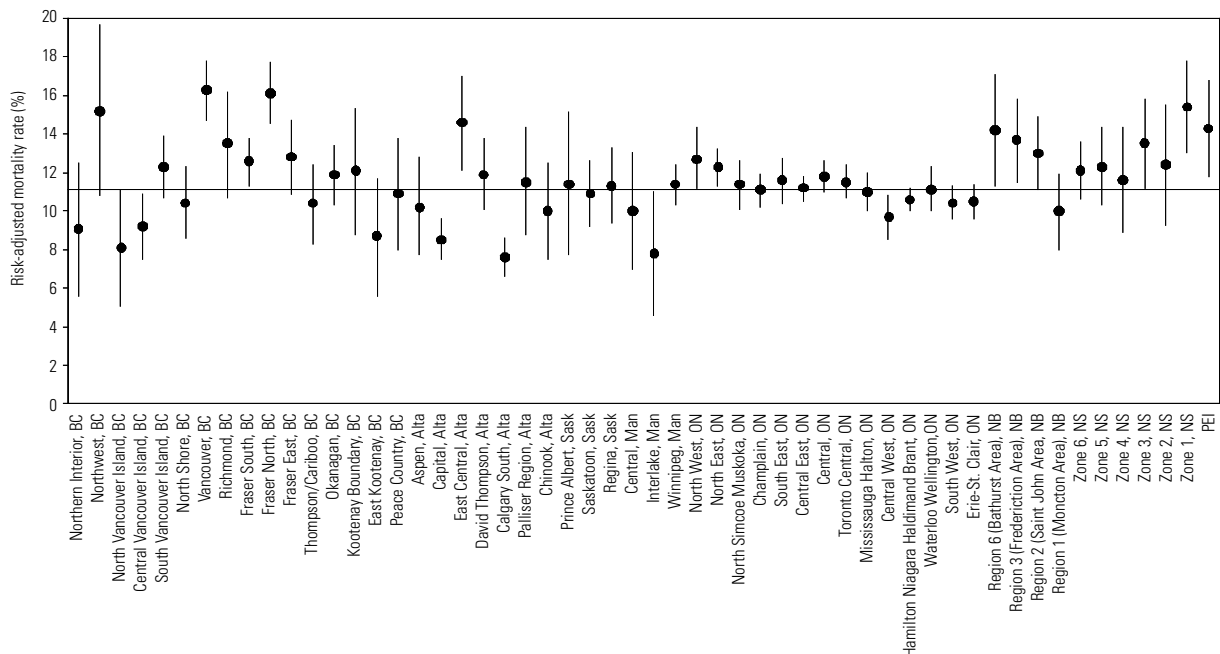
Admissions with a New Heart Attack Falling

Fewer people are being admitted to hospital with heart attacks. After adjusting for population growth and aging, the rate of hospitalization with a new heart attack dropped 18.9% between 1999–2000 and 2004–2005.* By the end of this period, 177 people out of every 100,000 were admitted to a hospital with a new heart attack each year. However, there was significant variation across the country. At 210 hospitalizations per 100,000 population, Prince Edward Island had the highest age-standardized rate. British Columbia had the lowest rate (126 per 100,000 population).

Regional Differences in In-Hospital Mortality Rates

Patients admitted today are also less likely to die in hospital than in the past. Between 1999–2000 and 2004–2005, the 30-day in-hospital mortality rate for patients with new heart attacks dropped from 13.4% to 11.1%.* The result? About 400 fewer people died in these jurisdictions in the last year than would have if survival rates had not improved.

TABLE 1: Risk-adjusted 30-day in-hospital mortality rates following admission with a new heart attack, larger health regions, 2002–2003 to 2004–2005



Notes: The solid line indicates the overall rate (11.1%). Rates are estimated to be accurate to within the range indicated by the vertical bars 19 times out of 20 (corresponds to the 95% confidence interval for risk-adjusted rate). Data from Quebec and Newfoundland and Labrador are excluded due to different coding of diagnosis types and heart attack, respectively. Source: Hospital Morbidity Database, CIHI; Discharge Abstract Database, CIHI.

* To maximize comparability trends in rates exclude Quebec and Newfoundland and Labrador. Mortality trends also exclude B.C.

That said, patient outcomes are not the same everywhere. While about 1 in 10 people admitted with a new heart attack died in hospital within 30 days overall, death rates in some larger health regions were more than double those in others. The range for 2002–2003 to 2004–2005 was 7.6–16.3% after differences in age, sex and the presence of other illnesses known to influence mortality (i.e., comorbid conditions) were accounted for. Of the 54 larger regions for which data are available (population of 75,000 people or more), five had rates statistically significantly lower than the overall average. Eleven had higher rates. Had these regions been able to achieve the overall mortality rate, there would have been about 345 fewer deaths over this period.

These differences are undoubtedly the result of many factors, including underlying conditions that may affect patients’ risk of dying, as well as care before, during and after a hospital stay. Improving our understanding of factors associated with variation in heart attack mortality rates can enhance our collective ability to focus efforts to improve cardiac health and care.

Behind the Rates: Who Is Most at Risk?

Heart attack patients in some regions are older or have more health problems than in others so regional rates must be adjusted to make comparisons as fair as possible. For example, the risk of having a heart attack rises with age, as does the risk of dying after having had one. After taking sex and comorbid conditions into account, the chance that a person aged 50–64 admitted with a new heart attack will die in hospital within 30 days is more than two times higher than for younger patients. Risks are even higher for seniors.

In addition, outcomes differ for men and women. Men are more likely to be admitted to hospital with a new heart attack but have lower mortality rates. They also tend to be younger than their female counterparts. Even after taking age and comorbid conditions into account, women admitted with a new heart attack are 16% more likely than men to die in hospital within 30 days of their admission. Previous international research has suggested a number of factors that may explain this gap, including differences in the presentation of symptoms and differences in care (Kudenchuck 1996; Canto 2000). For example, new analyses show that Canadian women are less likely to be seen by a cardiac specialist in hospital, to be transferred to another facility, and to receive treatment in a higher-volume facility.

Types of Care Influence Survival Rates

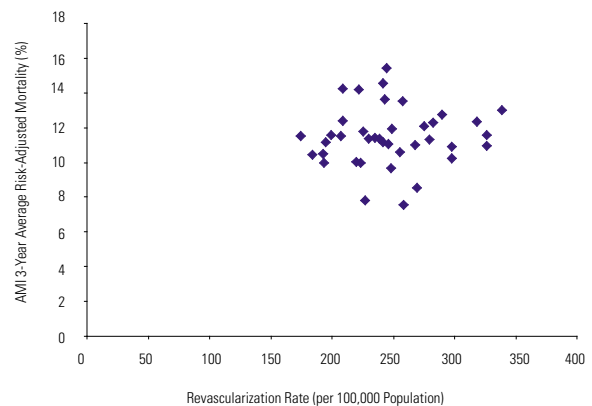
Timely intervention, as well as appropriate care and support, are just some of the factors that have an impact on a patient’s chances of surviving a heart attack. For example, previous studies have shown better cardiac outcomes for patients

treated by specialists and in centres that treat more patients, are located in urban areas (Birkmeyer et al. 2002; Vu et al. 2000), have on-site facilities to perform revascularization (Alter et al. 2005) and more closely adhere to clinical guidelines (Petersen et al. 2006). Often, these factors are linked. Urban hospitals tend to treat more patients, have on-site revascularization and have more specialists on staff. Likewise, other studies have found that hospitals with cardiology departments or cardiologists on staff are more likely to deliver recommended drug therapies and that cardiologists refer more patients for specialized interventions (Abubaker et al. 2004; Gottwik et al. 2001; Kaykin et al. 2002).

The latest Canadian data show that just over one-third (36%) of patients admitted with a new heart attack were mainly cared for by a cardiac specialist during their initial hospital stay. After controlling for differences in age, sex and the presence of comorbid illnesses, these patients were less likely to die in hospital within 30 days than other patients. The same was true of patients treated in higher-volume facilities and those who

Comparing Revascularization and Mortality Rates

Not all patients who have a heart attack need revascularization procedures, but some researchers have found that higher rates are associated with better outcomes, at least for certain types of patients. At a population level, however, other factors also matter. For example, there was little relationship between a health region’s risk-adjusted 30-day in-hospital mortality rate for patients admitted with a heart attack between 2002–2003 and 2004–2005 and its revascularization rate. Health regions with similar revascularization rates had very different death rates, and regions with similar mortality rates had widely varying intervention rates. For instance, regions with death rates of 12–13% had age-standardized revascularization rates of 209–399 per 100,000 population in 2003–2004.



Notes: Includes 39 larger health regions for which data were available for both indicators. Revascularization rates are age-standardized using the 1991 census population. Sources: Discharge Abstract Database, CIHI; National Ambulatory Care Reporting System, CIHI.

were transferred to another facility, perhaps to receive specialized interventions.

Most patients recover at home or in other healthcare facilities once discharged from the hospital. However, some must return to hospital within a short time because they experience further health problems or need additional care (Tu et al. 2003). Overall, 7% of patients hospitalized with an AMI between 2002–2003 and 2004–2005 had an unplanned return to hospital within 28 days due to a related health problem. Here, too, there are important regional variations. For example, six health regions had risk-adjusted rates that were less than 5%, while another six had rates over 10%.

Conclusion

As with deaths, not all unplanned readmissions are avoidable or preventable based on what we know today. However, in either case, low rates may suggest opportunities to learn from prevention strategies, practices, care models or other factors contributing to good outcomes. Likewise, high rates may prompt further analysis, taking into account patient and community characteristics, patient care and health services in and out of hospital.

Across the country, dozens of community groups, clinicians, healthcare organizations, policy-makers and others are committed to improving cardiac health and patient outcomes. While some factors are more amenable to change than others, this analysis shows that inroads have been made in reducing admission rates and in-hospital deaths. Improving our understanding of the persistent regional variations in both admission and mortality rates may provide clues to inform further improvement efforts.

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