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Title	Cardiac intervention rates for older acute myocardial infarction patients in the United States and Ontario, 2003-2013: a retrospective cohort study
Authors	Laura C. Yasaitis PhD, Jun Guan MSc, Dennis T. Ko MD MSc, Amitabh Chandra PhD, Therese A. Stukel PhD
Reviewer 1	Martin Dawes
Institution	Department of Family Medicine, University of British Columbia, Vancouver, BC
General comments (author response in bold)	This study identified the percutaneous coronary intervention in adults aged 66-99 in the US and Ontario having an acute myocardial infraction between 2003 and 2013 PCI rates for patients with STEMI is almost the same in 2013. The authors point out that the system of care in Canada is delivering the PCI in the same timely fashion as the US system. This research used databases to identify the patients and the outcomes. A rigorous approach was used to identify and analyze data in both settings. Sensitivity analyses were undertaken to assess rates. The data analysis is described in close detail as there were differences in some recording of data between the two settings. This does not seem to have affected the overall finding. Due to the limitations of the data the authors responsibly did not include anything about mortality. The data appears valid and the findings robust. The work done to develop the data models was significant. The issue I have is the overall conclusion quite limited, as confirmed in their discussion. This data only applies to one province, Ontario. As such I think the conclusion of this work is not going to be of sufficient interest to professionals outside Ontario. The methodology and the process is interesting. **This was already reported as a limitation in the paper (p13).**
Reviewer 2	Nicole Etherington
Institution	Ottawa Hospital Research Institute, Ottawa, Ont.
General comments (author response in bold)	1. The authors may wish to discuss on healthcare system differences between the two countries may or may not contribute to the reported findings (i.e. universal/public vs multi-payer, heavily private). **We have provided more context on the US health care system (p5). While health care is universally available to Ontario residents of all ages, US Medicare is a single-payer system that is universally available only to Americans over the age of 65 and covers invasive cardiac procedures. Medicare patients can choose to receive coverage via traditional Medicare, which reimburses providers on a fee-for-service (FFS) basis, or via a managed care plan or HMO. For Medicare beneficiaries who receive care under a managed care plan, or HMO, the full claims history is not available so we censored followup when they enrolled in an HMO (0.25% of patients) (p5).** **Private insurance covers deductibles and co-payments only; however, most Medicare beneficiaries have private MediGap insurance that pays these copays and deductibles. The poor are not subject to these copayments. And about a third of Medicare beneficiaries are in Medicare advantage plans that don't have cost sharing.** 2. There are also some population sociodemographic differences between the two countries related to cardiac outcomes (e.g. race, socioeconomic status). Were these considered by the authors? **We did not analyze the PCI percentages by socioeconomic status (SES) since it was not possible to define SES in a consistent manner across countries, making interpretation of findings challenging. We have, however,**

	indicated that although AMI patients in both countries had health insurance and access to treatment, some of the differences may be due to sex or socioeconomic disparities across countries even among fully insured patients (p13).
Reviewer 3	Louise Pilot
Institution	Medicine, McGill University, Montréal, Que.
General comments (author response in bold)	The investigators looked at temporal trends in the use of cardiac procedures in patients with acute myocardial infarction in a sample of patients in the United States covered by Medicare and in all Ontario patients aged greater than 65. The investigators looked at temporal trends over a 10 year period and found that the difference in rates of used narrowed considerably of this period between these two jurisdictions. The study results are clearly reported. Major Comments 1. The data presented are from 2003 to 2013. Surprisingly more recent data is not presented by the investigators. Surely data up to 2019 is available to the investigators for Ontario and should be reported so as to provide an idea of trajectory. This information would be of interest to Ontario. The dated aspect of the findings should be acknowledged as it remains unclear how practice in both jurisdictions is 7 years later and how should these results be interpreted. **We agree that this is a major limitation of the study and have expanded the limitations to include the limited time period (p13). While more up-to-date data are available for Ontario, the Data Use Agreement under which we obtained the US data was limited, and data past 2013 were not available in a timely manner for these analyses. Applying for a new Data Use Agreement would potentially delay publication by two years or more. We believe these findings are still of interest and relevant, given that no other studies have documented how Ontario's health care delivery for AMI has changed so dramatically relative to the United States since the early 2000s.** 2. Comparability of Cohorts: The Medicare population is varied in terms of additional health insurance. Some Medicare beneficiaries have additional private insurance, some do not, whereas in Ontario all have similar insurance coverage at least in terms of the coverage for the cardiac procedures that are discussed in this article. Comparing the Medicare population with additional coverage would be a better comparison group to Ontarians. In fact, the rates in the US might be even higher. **Medicare covers invasive cardiac procedures. Private insurance covers deductibles and co-payments only; however, most Medicare beneficiaries have private MediGap insurance that pays these copays and deductibles. The poor are not subject to these copayments. And about a third of Medicare beneficiaries are in Medicare advantage plans that don't have cost sharing. We did not restrict the study to patients with additional insurance since all AMI patients who are offered PCI receive the treatment.** 3. Severity Index: This index is cohort-specific and in fact, is related to treatment. So comparing procedure rates by risk group is somewhat intertwined. Presumably, the risk is decreased by undergoing procedures. Such a lack of dependence should be discussed. **We agree that if patients were treated, their 30-day mortality could decrease, so this is not a completely unbiased severity index; however, it is computed**

	based only on patients' personal risk factors, and regardless of whether or when they received treatment. It does not include process measures or physician or hospital factors that might influence treatment decisions as the same patient might be treated in one hospital or physician but not with another. **It estimates the average effect of patient risk factor combinations on mortality, given that some will receive the treatment, and some will not, and has been used in many previous studies to characterize AMI baseline risk, Stukel, (2012), among others.** 4. Sex Differences: Although not the focus of the paper, the results should be presented by sex rather than adjusted for sex. At least supplementary tables should be provided for men and women separately. **We discussed this suggestion among the co-authors and decided not to include PCI rates by sex in the paper. In the limitations section, we have indicated that sex might explain some of the differences across countries even though patient sex was well balanced overall (p13). The main reason we prefer to not include PCI procedure rates by sex (or SES) is that this would require a discussion of anatomical differences as well as health disparities, which we cannot add to the paper given its current length and focus.** 5. PCI in patients with Cath and CABG: PCI rates should be reported only among those with cath. **We reported PCI rates among all study patients.** **CABG rates are still much higher in the USA i.e. 4% versus less than 1% in Ontario. Such findings should be highlighted.** **Done. But the percentages are 9.3% (US) vs. 7.8% (Ontario) (p10).** 6. Outcomes: The importance of these findings would greatly be enhanced if changes in mortality or lack thereof during this period would be presented. Surely, these data are available to the investigators. **We discussed whether to include mortality but decided against it. Our rationale appears in the limitations section. Lack of full clinical data and inability to combine datasets precluded us from directly comparing mortality. Comparisons of mortality would require fine adjustment for confounding for unobserved factors such as disease severity, smoking status, and clinician judgment regarding who might benefit. Any differences, or lack thereof, would be difficult to interpret using health administrative data. Reviewer 1 has commended us for not attempting to so.**