



EVIDENCE >> INSIGHT >> ACTION



**Issue Brief:**  
**Building Momentum in Using the Avoidable Mortality Indicator in Canada**

15 February 2013

#### McMaster Health Forum

For concerned citizens and influential thinkers and doers, the McMaster Health Forum strives to be a leading hub for improving health outcomes through collective problem solving. Operating at the regional/provincial level and at national levels, the Forum harnesses information, convenes stakeholders, and prepares action-oriented leaders to meet pressing health issues creatively. The Forum acts as an agent of change by empowering stakeholders to set agendas, take well-considered actions, and communicate the rationale for actions effectively.

#### Authors

Lebei Pi, Bachelor of Health Sciences (Honours) Candidate, McMaster University

François-Pierre Gauvin, PhD, Lead, Evidence Synthesis and Francophone Outreach, McMaster Health Forum

John N. Lavis, MD PhD, Director, McMaster Health Forum, and Professor, McMaster University

#### Funding

The issue brief, and the stakeholder dialogue it was prepared to inform, were both funded by the Canadian Institute for Health Information (CIHI). The McMaster Health Forum receives both financial and in-kind support from McMaster University. The views expressed in the issue brief are the views of the authors and should not be taken to represent the views of CIHI or McMaster University.

#### Conflict of interest

The authors declare that they have no professional or commercial interests relevant to the issue brief. Staff employed by the funder and researchers working under contract with the funder provided much of the research evidence profiled in this brief. The authors had final authority over how this research evidence is profiled in the issue brief.

#### Merit review

The issue brief was reviewed by a small number of policymakers, stakeholders and researchers in order to ensure its scientific rigour and health system relevance.

#### Acknowledgements

The authors wish to thank Steering Committee members and merit reviewers for providing feedback on previous drafts of the brief. We are especially grateful to staff members of the Canadian Institute for Health Information for their input, as well as to Brenda Wannell, Cameron Mustard and Cordell Neudorf for their comments. The views expressed in the issue brief should not be taken to represent the views of these individuals.

#### Citation

Pi L, Gauvin FP, Lavis JN. Issue Brief: Building Momentum in Using the Avoidable Mortality Indicator in Canada. Hamilton, Canada: McMaster Health Forum, 15 February 2013.

#### Product registration numbers

ISSN 1925-2269 (print)

ISSN 1925-2277 (online)

**Table of Contents**

KEY MESSAGES..... 5

REPORT..... 7

    Background..... 8

    Key definitions and features of the avoidable mortality indicator ..... 10

    Avoidable mortality in Canada..... 12

    Understanding avoidable mortality within a suite of health system performance indicators ..... 13

THE PROBLEM..... 17

    Limited awareness, understanding or agreement about the usefulness of the indicator ..... 19

    Limited (use of) research evidence to inform decision-making about prevention and treatment..... 19

    Lack of incorporation of the indicator into performance measurement and management systems..... 19

    Additional equity-related observations about the problem..... 19

THREE ELEMENTS OF A COMPREHENSIVE APPROACH FOR ADDRESSING THE PROBLEM ..... 21

    Element 1 – Increase dialogue about the avoidable mortality indicator and its potential uses..... 22

    Element 2 – Support informed decision-making about prevention and treatment programs ..... 25

    Element 3 – Incentivize actions that prioritize investments in prevention versus treatment, addressing particular conditions or addressing particular inequities..... 28

    Additional equity-related observations about the elements ..... 30

IMPLEMENTATION CONSIDERATIONS..... 31

REFERENCES..... 33

APPENDICES ..... 39



## KEY MESSAGES

### What's the problem?

- There is as yet limited use of the avoidable mortality indicator in Canada for reporting, monitoring and decision-making, which can be understood by considering the following three sets of inter-related issues:
  - there is limited awareness, understanding or agreement about the usefulness of the indicator;
  - there is limited research evidence to inform decision-making about prevention and treatment programs that could have an impact on avoidable mortality, and/or there is limited use of the available research evidence; and
  - there is a lack of incorporation of the avoidable mortality indicator in performance measurement and management systems.

### What do we know (from systematic reviews) about three viable elements of an approach to address the problem?

- Element 1 – Increase dialogue about the avoidable mortality indicator and its potential uses
  - We found several systematic reviews outlining the benefits of educational interventions for health professionals, including educational outreach, printed materials and other continuing education activities, any of which could help to foster dialogue about the indicator among this group.
  - One high-quality (but old) review provided insight about educating the public through mass media campaigns, however, the outcome studied was health service utilization and not support for accountability at the population level.
- Element 2 – Support informed decision-making about prevention and treatment programs
  - Several systematic reviews pertain to funding, synthesizing, disseminating and supporting the use of research evidence. While these reviews found insufficient evidence about the effectiveness of strategies for encouraging the use of research evidence (mostly systematic reviews) by health policymakers and managers, one review identified several supportive conditions for evidence use: when there is a single clear message, the change is relatively simple to accomplish, and there is a growing awareness by users of the evidence that a change in practice is required.
- Element 3 – Incentivize actions that prioritize investments in prevention versus treatment, addressing particular conditions or addressing particular inequities
  - We found one systematic review that has relevance to re-orienting existing performance management systems, and this review identified 16 quality concepts applicable to informing the development of cross-sectoral quality improvement frameworks. Examples of such concepts include: 1) linkages and partnerships among systems, networks and providers; 2) commitment to a continuous learning environment; and 3) use of strategic planning processes to be responsive to change.
  - Several systematic reviews address public reporting, although most were about public reporting on healthcare topics that would have high salience for healthcare consumers, which is arguably quite different from public reporting about a broad health indicator that is likely to be seen as having less immediate relevance to the public. One review revealed that quality measures that are publicly reported are likely to improve over time.

### What implementation considerations need to be kept in mind?

- Potential barriers to a comprehensive approach can be identified at the level of individuals (e.g., public concerns about prioritizing investments in prevention over treatment when treatment is perceived as such a pressing concern), providers (e.g., concerns about being held accountable for avoidable mortality caused by factors beyond their control), organizations (e.g., inability to see the value in using the avoidable mortality indicator within an organization), and systems (e.g., disinterest in macro-level indicators that do not provide actionable messages). Efforts to address these barriers need to be aware of potential windows of opportunity (e.g., reviews of existing measurement and performance management systems at provincial/territorial, regional and professional levels) and learn from other jurisdictions that are currently using the avoidable mortality indicator (such as Australia, New Zealand and the U.K.).





## REPORT

Over the past three decades, Canada has made substantial progress in reducing the national rate of avoidable mortality (deaths that could potentially have been avoided through disease prevention or healthcare services). In fact, the national avoidable mortality rate has decreased by half – from 373 per 100,000 in 1979 to 185 per 100,000 in 2008.<sup>(1)</sup> During this period, avoidable mortality attributed to preventable causes decreased by 47%, while avoidable mortality attributed to treatable causes decreased by 56%. Additionally, Canada is faring well from an international standpoint, ranking the third lowest amongst G7 nations in rates of avoidable mortality, after Japan and France.<sup>(1)</sup> However, despite the significant gains that Canada has made in reducing avoidable mortality rates, there still exist variations in the distribution of avoidable mortality across provinces and territories, and across different population groups.<sup>(1)</sup> Additional efforts are needed to reduce avoidable mortality rates both among the jurisdictions and groups being ‘left behind’, as well as overall.

In recent years, there has been increased interest in the concept of avoidable mortality due to “its potential to link population health outcomes to the functioning of the health system.”<sup>(1)</sup> In particular, the release of the *Health Indicators 2012* report,<sup>(1)</sup> which included a special focus on avoidable mortality trends across Canada, garnered significant attention across the country at the time of its release, with extensive national and local media coverage.<sup>(2-5)</sup>

However, despite the recent attention given to avoidable mortality trends in Canada, the use of the avoidable mortality indicator has been seen primarily within the academic community, with limited use (defined as reporting on avoidable mortality rates, monitoring these rates, and making decisions on the basis of these rates) by governments, supported agencies and health councils in Canada.

This issue brief and the stakeholder dialogue it was prepared to inform were designed to explore what is known about the limited use of the avoidable mortality indicator in the country, elements of what could be an approach to supporting the use of the avoidable mortality indicator, and key implementation considerations for such an approach. We begin the

### Box 1: Background to the issue brief

This issue brief mobilizes both global and local research evidence about a problem, three elements of a comprehensive approach for addressing the problem, and key implementation considerations. Whenever possible, the issue brief summarizes research evidence drawn from systematic reviews of the research literature and occasionally from single research studies. A systematic review is a summary of studies addressing a clearly formulated question that uses systematic and explicit methods to identify, select and appraise research studies, and to synthesize data from the included studies. The issue brief does not contain recommendations, which would have required the authors of the brief to make judgements based on their personal values and preferences, and which could pre-empt important deliberations about whose values and preferences matter in making such judgments.

The preparation of the issue brief involved five steps:

- 1) convening a Steering Committee comprised of representatives from the partner organization (CIHI) and the McMaster Health Forum;
- 2) developing and refining the terms of reference for an issue brief, particularly the framing of the problem and three elements of what could be a comprehensive approach for addressing it, in consultation with the Steering Committee and a number of key informants and with the aid of several conceptual frameworks that organize thinking about ways to approach the issue;
- 3) identifying, selecting, appraising and synthesizing relevant research evidence about the problem, elements of a comprehensive approach to address the problem, and implementation considerations;
- 4) drafting the issue brief in such a way as to present concisely and in accessible language the global and local research evidence; and
- 5) finalizing the issue brief based on the input of several merit reviewers.

The three elements could be pursued singly, simultaneously with equal or different emphasis, or in a sequenced way.

Unlike a Forum evidence brief, a Forum issue brief does not involve as comprehensive an evidence review by Forum staff.

The issue brief was prepared to inform a stakeholder dialogue for which research evidence is one of many considerations. Participants’ views and experiences and the tacit knowledge they bring to the issues at hand are also important inputs to the dialogue. One goal of the stakeholder dialogue is to spark insights – insights that can only come about when all of those who will be involved in or affected by future decisions about the issue can work through it together. A second goal of the stakeholder dialogue is to generate action by those who participate in the dialogue, and by those who review the dialogue summary and the video interviews with dialogue participants.

brief by providing historical background about the development of the avoidable mortality indicator, defining key concepts and describing key features of the indicator, and describing the use of the avoidable mortality indicator in Canada.

## **Background**

Health indicators play an important role in measuring the influence of the health system on a target population.(6) By health system, we are referring to a system that incorporates both healthcare and public health. Moreover, measuring a variety of performance indicators and using them to compare, learn and improve has become a central component of health policy – particularly because accountability and transparency are central to notions of health system governance and stewardship.(7) The performance of health systems can be made explicit and used as a basis for improvement strategies, provided that there are valid, reliable and relevant indicators to measure the performance of healthcare services (at the meso level) and health systems (at the macro level), and that this information is interpreted correctly to assess the relative performance of healthcare services or health systems, so that appropriate decision-making can be employed to improve health outcomes.(7)

Different types of indicators have been used in empirical epidemiological studies to assess healthcare services and health systems. Donabedian identified three components of healthcare about which it is necessary to obtain information for the purpose of assessing healthcare quality – structure/organization, process and outcome.(8-10) Studies examining aspects of health system performance are often categorized into process studies (i.e., those evaluating indicators relating to the process of healthcare, such as rate of use of a specific surgical procedure) and outcome studies (i.e., those evaluating indicators relating to the outcome of healthcare, such as death or survival from a specific condition).(11) Mant, among many others, claims that measures of outcome are of greater intrinsic interest than measures of process as they can “reflect all aspects of care, including those that are otherwise difficult to measure”.(12)

Trends in mortality rates (an outcome measure) have often been the starting point for discussions about the relative importance of preventive and therapeutic programs and services.(13) The concept of avoidable mortality was “based on the tradition of using potentially avoidable mortality such as perinatal and maternal mortality as negative indicators of health and as a starting point for the evaluation of health care”.(14) However, avoidable mortality measures offer epidemiological surveillance of a broader group of deaths that can serve to provide warning signals of potential gaps in the overall health system.(15;16)

### **Box 2: Equity considerations**

A problem may disproportionately affect some groups in society. The benefits, harms and costs of elements to address the problem may vary across groups. Implementation considerations may also vary across groups.

One way to identify groups warranting particular attention is to use “PROGRESS,” which is an acronym formed by the first letters of the following eight ways that can be used to describe groups†:

- place of residence (e.g., rural and remote populations);
- race/ethnicity/culture (e.g., First Nations and Inuit populations, immigrant populations, and linguistic minority populations);
- occupation or labour-market experiences more generally (e.g., those in “precarious work” arrangements);
- gender;
- religion;
- educational level (e.g., health literacy);
- socio-economic status (e.g., economically disadvantaged populations); and
- social capital/social exclusion.

This issue brief strives to address all people, but (where possible) it also gives particular attention to two groups among whom disparities are likely to be judged as particularly unfair or unjust:

- low socioeconomic status populations; and
- minority ethnocultural groups.

Many other groups warrant serious consideration as well, and a similar approach could be adopted for any of them.

† The PROGRESS framework was developed by Tim Evans and Hilary Brown (Evans T, Brown H. Road traffic crashes: operationalizing equity in the context of health sector reform. *Injury Control and Safety Promotion* 2003;10(1-2): 11–12). It is being tested by the Cochrane Collaboration Health Equity Field as a means of evaluating the impact of interventions on health equity.

The following timeline briefly captures the introduction of and key evolutions in the avoidable mortality indicator (17):

*Concept and method introduced*

- 1976: American working group, chaired by David D. Rutstein, proposed the outcome measure of “unnecessary untimely deaths” to serve as a measure of the quality of medical care (15)
  - selected around 80 conditions for which evidence suggested that disease, disability or death were wholly or substantially avoidable through adequate medical care, given the level of medical knowledge and technical development at the time;
  - attempted to indicate whether conditions were preventable or treatable; and
  - set an arbitrary upper age limit for premature (and therefore avoidable) mortality at 65 years of age.
- 1980: Rutstein and colleagues updated the list of 80 conditions to 91 conditions, owing to medical advances and the move to the 9th revision of the International Classification of Diseases.(18)

*Concept applied empirically*

- 1978: Gerald S. Adler (19)
  - applied Rutstein’s concept empirically for the first time, by evaluating preventable mortality in the U.S. (from 1968 to 1971), in an effort to “demonstrate the usefulness of this approach” as a measure of healthcare quality.
- 1983: John R. Charlton and colleagues (16)
  - applied Rutstein’s concept at the population level for the first time, by analyzing regional variation in mortality in England and Wales (from 1974 to 1978); and
  - introduced the terms “avoidable deaths” and “[conditions] amenable to medical intervention”.

*Method revised and extended*

- 1983: John R. Charlton and colleagues (16)
  - restricted list of conditions to only those “regarded as most amenable to medical intervention (excluding conditions whose control depends mainly on prevention)”; and
  - set upper *and* lower age limits between which deaths were considered avoidable.
- 1986-1988: Kari Poikolainen and Juhani Eskola (20;21)
  - using a concept similar to that of Charlton and colleagues, analyzed a separate set of “partly amenable” conditions (such as ischemic heart disease, non-melanoma skin cancer, and meningitis), thus expanding considerably the concept of ‘avoidable mortality’ and the proportion of mortality deemed avoidable; and
  - drew up explicit list of “not amenable” conditions.
- 1988: European Community Concerted Action Project on Health Services and ‘Avoidable Deaths’ (ECCAP), directed by Walter W. Holland and published as the European Community Atlas of Avoidable Death (22)
  - selected conditions classified as either amenable to secondary prevention (i.e., halting or slowing the progression of a risk factor or disease) and medical treatment (i.e., treating the risk factor or disease), or amenable to primary prevention (i.e., avoiding the development of a risk factor or disease).
- 1988: Johan P. Mackenbach and colleagues (23)
  - linked trends in mortality to specific innovations in medical care; and
  - restricted the definition of medical care to “the application of biomedical knowledge through a personal service system” (adapted from McDermott).(24)
- 1998: Lorenzo Simonato and colleagues (25)
  - classified conditions into those avoidable through primary prevention; amenable to secondary prevention through early detection and treatment; and amenable to improved treatment and medical care.

- 2001: Martin Tobias and Gary Jackson (26)
  - refined the approach of Simonato and colleagues, by assigning relative weights to conditions considered ‘avoidable’ to reflect the scale of its potential preventability within each category; and
  - extended the upper age limit for premature (and therefore avoidable) mortality to 75 years (from 65).
- 2004: Ellen Nolte and Martin McKee (17)
  - applied an amended version of Rutstein’s original lists of causes of death considered amenable to healthcare to countries in the European Union (EU-15).

Many empirical studies using the avoidable mortality indicator have been conducted in Australasian, European and North American countries,(27) with the vast majority being conducted in Western industrialized nations.(14) In general, studies using the avoidable mortality indicator either adopt a cross-sectional approach (i.e., analyzing avoidable mortality at a single point in time, often with reference to variations across geographical regions or across population groups), or analyze trends in avoidable mortality variations over time.(17) There is substantial variation across these studies in the methodological approach used to calculate avoidable mortality rates, the selection and application of variables that could explain patterns in these rates, and the quality of the resulting studies. Most notably, there is substantial variation in the selection of ‘avoidable’ causes, with a range of methodologies to identify the set of conditions amenable to medical care.(17)

In general, the findings from studies of time trends indicate that avoidable mortality rates have declined at a much faster rate than mortality rates from ‘non-avoidable’ causes over the time periods specified.(17) For instance, Charlton et al. concluded this from a study of 1950-1980,(28) Simonato et al. from an analysis of 1955-1994,(25) and Kjellstrand et al. from a study on trends between 1980-1990.(29) Although many factors may have accounted for the decline, the consistency in the pattern of declines in avoidable mortality and the rapidity of this decline compared to the decline in ‘non-avoidable’ mortality suggests that “at least part of the mortality decline is due to improvements in healthcare.”(30)

In contrast, in cross-sectional studies analyzing variations in avoidable mortality across geographical regions, the association between avoidable mortality and healthcare characteristics has been found to be weak and inconsistent.(17) Instead of pointing to particular healthcare characteristics per se, these studies show a strong and consistently negative association between avoidable mortality and socioeconomic factors. These studies have consistently indicated that the socioeconomically disadvantaged face higher risks of death from avoidable conditions than the socioeconomically advantaged. Often, such studies are “based on the assumption that differences in health status between different social groups in society may be due, in part, to differences in access to and/or quality of health services,”(17) whereas the true reason may lie elsewhere.

### **Key definitions and features of the avoidable mortality indicator**

Within the scope of this issue brief, the avoidable mortality concept is defined in the same manner as in the *Health Indicators 2012* report – as a subset of the premature mortality concept (which are deaths that occur among those under the age of 75). Avoidable mortality refers to “untimely deaths that should not occur in the presence of timely and effective healthcare or other public health practices, programs and policy interventions.”(1) It is limited to causes of death where mechanisms of mortality reduction are known, and “serves to focus attention on the portion of population health attainment that can potentially be influenced by the health system.”(1) Avoidable mortality can therefore serve as a measure of overall health system performance.

The avoidable mortality concept can be further divided into three subsets:

- *Potentially avoidable mortality* is defined as “premature deaths that could potentially have been avoided through all levels of prevention (primary, secondary, tertiary)” and through treatment.(1)
- *Mortality from preventable causes* (or preventable mortality) refers to deaths that can be avoided through the prevention of disease onset (i.e., incidence reduction). It includes deaths from conditions linked to

modifiable factors or deaths related to effective public health interventions. Prevention of disease onset is mainly accomplished through primary prevention, which includes public health programs that promote protective factors that sustain health; policies aimed at addressing social determinants of health; and policies aimed at reducing harmful risk factors that contribute to ill health (e.g., behavioural and environmental risk factors that make people susceptible to disease).(1)

- *Mortality from treatable causes* (or amenable mortality) is defined as deaths that can be avoided by averting or delaying death after a condition has developed (i.e., case fatality reduction). This can mainly be accomplished through secondary and tertiary prevention, which includes early detection or intervention to identify a disease, delaying the progression of early or preclinical disease to minimize disability, and treatment of existing health conditions.

In addition to clarifying the definitional distinction between avoidable mortality and the broader concept of premature mortality, there is also a need to highlight a measurement-related distinction. There are two alternative metrics for premature mortality measures: 1) mortality rate, and 2) potential years of life lost (PYLL). Mortality rate is a measure of the number of deaths (in general or due to specific causes) in a population per unit of time, typically expressed in units of deaths per 1,000 or 100,000 individuals per year. PYLL, on the other hand, is an estimate of the number of years an individual would have lived had she or he not died prematurely. It therefore takes the age of death into consideration and lends greater weight to deaths that occur among younger people. The avoidable mortality indicator, when used as a health system performance measure, is calculated as a mortality rate and not in PYLL (which is what is used when the indicator is being reported as a health status indicator).

The avoidable mortality indicator has been argued to have a number of concrete potential uses:(1)

- provides a broad overview of performance, and specifically helps to identify at a particular point in time, and to monitor over time, potential gaps in health system performance (e.g., large gaps in healthcare delivery and problematic disease categories) and in broad actions to address the social determinants of health;
- suggests where it may be necessary to disaggregate the indicator into disease components and drill-down into disease categories that are driving key aspects of avoidable mortality;
- points out differences in rates across geographical regions and between different groups, which may provoke examinations of the potential causes of such differences (such as inequity);
- fosters discussion about the pros and cons of addressing preventable versus treatable mortality and of addressing preventable mortality through the health system versus through the social determinants of health;
- offers the potential to evaluate the impact of system-wide policy changes on population health outcomes; and
- serves as a good international comparator.

Some of these uses could be supported by presenting avoidable mortality data in different ways. For example, identifying inequities could be supported by presenting the proportion of mortality that is avoidable in different groups, which would facilitate the targeting of resources to groups with high proportions.

The avoidable mortality indicator has a number of strengths for health system policymakers and stakeholders:

- intuitiveness, particularly the breakdown of avoidable mortality into ‘preventable’ and ‘treatable’ deaths, as well as the all-or-none classification for each cause of death and the lack of complex modelling required to calculate it;(31)
- relevance, given its more direct relation to healthcare services and the health system than alternative health outcome indicators such as life expectancy, infant mortality rate and maternal mortality rate;(32;33) and
- availability (as of recently), given the use of a standardized methodology for all of Canada, the disaggregation at the level of province and territory, and the longitudinal perspective (although the definition of causes of death becomes complicated when the time frame includes previous versions of international disease classifications).

Some of the concerns about the avoidable mortality indicator have been addressed in recent years. For example, significant effort has been invested in standardizing the composition of the indicator (i.e., which deaths are labelled ‘avoidable’ and ‘unavoidable’ in Canada, in European countries, and in other contexts), and investments in this effort will likely continue as prevention and treatment approaches evolve and as context-specific objectives for using the indicator are identified. Other concerns, such as that the indicator does not capture morbidity, are shared with all mortality measures; while still others, such as that the indicator requires further unpacking in order to understand precisely where action is required, are shared with all ‘macro-level’ indicators. Two additional limitations warrant consideration:

- access to the data required for calculating the indicator can be costly in Canada and may not even be possible for certain geographic regions or population groups (such as those in the armed services and First Nations and Inuit populations) either because data about relevant attributes may not be available in the existing mortality data, or because the combination of attributes generates group sizes that raise confidentiality or quality concerns; and
- the indicator does not change rapidly – there is a time lag between implementation of system-wide policy changes and the impact seen in avoidable mortality rates – and it can be influenced by factors other than prevention and treatment (although the examples of factors commonly given, such as genetic predisposition, are only important if precise estimates of attribution are required).

### **Avoidable mortality in Canada**

Several studies of avoidable mortality have been conducted in Canada. The first such study was by Robert Pampalon in 1993, when he investigated both temporal and geographical variations in avoidable mortality rates in Quebec and its surrounding regions.<sup>(34)</sup> Since then, other studies have investigated avoidable mortality trends: across Canada,<sup>(35)</sup> across different socioeconomic groups or occupations within Canada,<sup>(36-38)</sup> and between Canada and the United States.<sup>(39)</sup>

In 2012, CIHI in collaboration with Statistics Canada integrated the avoidable mortality indicator into its *Health Indicators 2012* report for the first time. This report presented trends in avoidable mortality in Canada over time, providing a breakdown of the two subsets of avoidable mortality (that from preventable causes, and that from treatable causes).<sup>(1)</sup> The report can be read as a helpful complement to this issue brief.

In general, the report showed geographic variation across Canada with respect to progress in reducing avoidable mortality rates over the last three decades (see Table 1).

**Table 1:** Progress amongst Canadian provinces and territories in reducing avoidable mortality, 1979-2008

Indicator	Jurisdictions with largest decline in avoidable mortality (ordered from most to least decline)			Jurisdictions with smallest decline in avoidable mortality (ordered from most to least decline)		
	Jurisdiction	Age-standardized rate per 100,000 people		Jurisdiction	Age-standardized rate per 100,000 people	
		1979	2008		1979	2008
Avoidable mortality	Yukon (60% decline)	584.6	235.8	Manitoba (36% decline)	356.9	228.8
	Quebec (54% decline)	398.1	184.4			
	Ontario (53% decline)	368.1	173.5	Saskatchewan (31% decline)	330.3	227.5
	British Columbia (53% decline)	364.0	172.6			
Mortality from preventable causes	British Columbia (51% decline)	234.4	115.2	Manitoba (33% decline)	213.2	143.0
	Ontario (51% decline)	216.9	107.1			
	Yukon (49% decline)	350.9	180.7	Saskatchewan (26% decline)	200.4	148.3
	Quebec (49% decline)	237.2	121.4			
Mortality from treatable causes	Yukon (76% decline)	233.6	56.0	Manitoba (40% decline)	143.7	85.8
	Quebec (61% decline)	161.0	63.0	Saskatchewan (39% decline)	129.9	79.3
	New Brunswick (61% decline)	154.6	59.8			

Source: (1;40;41)



From these trends, one can infer that there have been some important shifts in relative performance of the provinces and territories over the past three decades. In particular, the prairie provinces (particularly Saskatchewan and Manitoba) – which had been faring very well in the late 1970s in terms of avoidable mortality rates compared to the rest of the country – now demonstrate some of the highest avoidable mortality rates among Canadian provinces and territories. Other provinces, such as Quebec, Ontario and British Columbia, have seen significant reductions in avoidable mortality rates.

In addition to geographical variations, the *Health Indicators 2012* report also pointed to a sex gap in avoidable mortality rates.(1) From 1979 to 2008, men have consistently had higher mortality rates than women for both treatable and preventable causes, with the male preventable mortality rate being more than twice that for females. Nevertheless, the rate of decline of preventable mortality over the past three decades has been greater for males (52%) than for females (36%), which has narrowed this sex gap. The sex gap in mortality from treatable causes has historically been much narrower compared to that for mortality from preventable causes.

The report further showed important disparities across socioeconomic strata. Mortality rates are consistently higher amongst those from the country’s least affluent neighbourhoods, with socioeconomic gradients being steeper for preventable mortality compared to mortality from treatable causes.(1) Socioeconomic disparities were even more pronounced when the sex gap was considered. In particular, in the period 2005-2007, the age-standardized preventable mortality rate for individuals living in the least affluent neighbourhoods was almost twice the rate of those in the most affluent neighbourhoods, while the ratio for mortality from treatable causes was 1.6. When the sex gap was considered, however, the ratio for preventable mortality rose to 4, while the ratio for mortality from treatable causes rose to 2, which may suggest ‘interaction’ between socioeconomic status and sex.

### Understanding avoidable mortality within a suite of health system performance indicators

While CIHI’s recent report focused on avoidable mortality, it concluded with data on the remaining suite of indicators measured by the organization, which we have presented below in relation to the CIHI-Statistics Canada health indicators framework (Table 2). The presumed aspiration with any such suite of indicators (and data about their rates and trends) is that it can help policymakers and stakeholders learn from jurisdictions that have experienced substantial progress.

**Table 2:** CIHI-Statistics Canada health indicators framework (with the avoidable mortality indicators bolded)

Category	Explanation	Sub-category	Examples
Health status	Health status allows one to determine how healthy Canadians are. Health status “can be measured in a variety of ways, including well-being, health conditions, disability or death” (1)	Well-being	Perceived health
			Perceived mental health
			Perceived life stress
		Health conditions	Adult body mass index
			Diabetes
			Pain or discomfort that prevents activities
			Low birth weight
			Injury hospitalization
			Hospitalized stroke event rate
		Human function	Functional health
			Participation and activity limitation
			Health-adjusted life expectancy
		Death	Infant mortality
Life expectancy			
Premature mortality			

*Building Momentum in Using the Avoidable Mortality Indicator in Canada*

			<b>Avoidable mortality (preventable)</b>
Non-medical determinants of health	Non-medical determinants of health “are known to affect our health and, in some cases, when and how we use health care” (1)	Health behaviours	Smoking
			Fruit and vegetable consumption
			Bicycle helmet use
		Living and working conditions	Post-secondary graduates
			Unemployment rate
			Average personal income
			Crime incidents
		Personal resources	Sense of community belonging
			Life satisfaction
		Environmental factors	Exposure to second-hand smoke
			Lead concentration
			Bisphenol A concentration
Health system performance	Health system performance allows one to determine how healthy the health system is. Indicators in this category “measure various aspects of the quality of health care” (1)	Acceptability	Patient satisfaction (and quality rating of services received)
		Accessibility	Influenza immunization
			Colorectal cancer screening
			Regular medical doctor
		Appropriateness	Wait time for hip fracture surgery (proportion with surgery within 48 hours)
			Caesarean section
		Competence	Patients with repeat hospitalizations for mental illness
			(Not available)
		Continuity	30-day readmission rate for mental illness
		Effectiveness	Ambulatory care sensitive conditions
			30-day in-hospital mortality
			30-day surgical readmission rate
Self-injury hospitalization rate			
	<b>Avoidable mortality (treatable)</b>		
Efficiency	(Not available)		
Safety	Hospitalized hip fracture event rate		
Community and health system characteristics	Indicators in this category “provide useful contextual information, but are not direct measures of health status or the quality of health care” (1)	Community	Population density
			Dependency ratio
			Aboriginal population
			Lone-parent families
			Visible minority population
		Health system	Inflow/outflow ratio
			Coronary artery bypass graft
			Hip replacement
			Contact with a medical doctor
			Contact with dental professionals
			Mental illness patient days rate
		Resources	General/family physicians

Source: Canadian Institute for Health Information (1) and Statistics Canada (42)

The avoidable mortality indicator can best be interpreted and used in the context of a suite of indicators that collectively:

- address both mortality and morbidity;
- have particular relevance at different levels of the system;
- change at different speeds;
- provide different types of insights about the potential causes of changes;
- reflect changes in different ways (e.g., leading or trailing indicators); and



- reflect trends over time, across geographical regions, and between population groups.
- Performance indicators being used in Canada typically do collectively meet these criteria. An example of one such framework, which has been developed to categorize and understand the relationships between the components of a suite of indicators, is provided below (Table 3).

**Table 3:** An example of an integrated suite of health indicators (with the avoidable mortality indicator bolded)

Dimension	Purpose	Examples	Level Targeted*
Health status and wellness	Allows assessment of how healthy Canadians are. Includes “measures such as rates of specific health conditions and causes of death and disability, and measures of well-being [which] help us understand the health of the population”(43)	Potential years of life lost due to suicide	Policymakers and funders
		Incidence rate for lung cancer	Policymakers and funders
		Mortality rate for stroke	Policymakers and funders
		Prevalence rate of human immunodeficiency virus (HIV)	Policymakers and funders
		Self-reported chronic obstructive pulmonary disease (COPD)	Policymakers and funders
		Body mass index (BMI)	Policymakers and funders
		Life expectancy	Policymakers and funders
		Infant mortality	Policymakers and funders
		<b>Avoidable mortality (preventable)</b>	Policymakers and funders
Health system performance – Access to healthcare	Allows assessment of how healthy the healthcare system is, specifically with respect to “whether Canadians have access to important procedures and services”(43)	Proportion of population that reports having a family doctor	Policymakers and funders
		Self-reported difficulty obtaining health information or advice	Policymakers and funders
		Self-reported difficulty obtaining immediate care	Manager
		Self-reported wait times for surgery	Manager
		Self-reported prescription drug spending as a percentage of income	Policymakers and funders
Health system performance – Quality of healthcare	Allows assessment of how healthy the healthcare system is, specifically with respect to “whether services delivered are appropriate, effective and safe”(43)	Patient satisfaction with health services	Manager
		Hospitalization rate for ambulatory care sensitive conditions	Manager
		Readmission rate for acute myocardial infarction (AMI)	Manager
		<b>Avoidable mortality (treatable)</b>	Policymakers and funders
Sustainability of the healthcare system	Provides a measure of the number of human resources and medical or technical resources available in the healthcare system	Number of family physicians	Policymakers and funders
		Number of registered nurses	Policymakers and funders
		Number of magnetic resonance imaging (MRI) scanners	Policymakers and funders; Manager
		Number of magnetic resonance imaging (MRI) tests	Policymakers and funders; Manager
		Number of computed tomography (CT) scanners	Policymakers and funders; Manager
Non-medical determinants of health	Provides a picture of what factors outside the health system affect the health of Canadians. Includes “measures of living conditions, health behaviours, socio-economic factors, and environmental factors [which] provide insight into non-medical aspects of life that impact our health”(43)	Fruit and vegetable consumption	Policymakers and funders
		Life satisfaction	N/A
		Sense of community belonging	N/A
		Smoking rates	Policymakers and funders
		Average personal income	N/A
Community and health system characteristics	Provides a picture of how Canadians use healthcare and what the communities are like. “Indicators in this group are not direct measures of Canadians’ health or the quality of healthcare. Instead, they provide context to help us understand various issues”(43)	Population group characteristics such as number and percentage of immigrants, single parent families, etc.	Policymakers and funders
		Rate of hip replacement surgery	Policymakers and funders; Manager
		Health spending	Policymakers and funders
Disparity (or inequity if the disparity is deemed unfair or unjust)	Allows assessment of the equality with which Canadians are able to enjoy good health and quality of life. “With this group we can look at one indicator through the lens of another, to understand health related disparities and to ask questions such as: What differences in health status exist among groups in Canada’s population, and what are the contributing factors?”(43)	Injury hospitalization by neighbourhood income level	Policymakers and funders; Manager

\*For clinicians: real-time reports and assessment protocols provide evidence for best practice  
For managers: comparable quality and safety indicators measure organizational performance

## *Building Momentum in Using the Avoidable Mortality Indicator in Canada*

For policymakers and funders: population trends, outcomes and service profiles support health system sustainability, planning, resource allocation and accountability

Source: Adapted from the work of the Health Council of Canada (43) and Health Canada (44)

This issue brief incorporates the above definitions, builds on what is known about avoidable mortality in Canada, and understands the avoidable mortality indicator as part of a suite of indicators. It examines the limited use of the indicator in Canada to date (and the possibilities opened up by the CIHI focus on the indicator), the elements of what could be an approach to building momentum in using the indicator, and key implementation considerations.

To examine the use of the avoidable mortality indicator, two sectors will be addressed:

- sectors where health is an explicit objective (e.g., primary healthcare and public health) where the issue is about investments in prevention versus treatment to reduce avoidable mortality; and
- sectors where health is a potential consequence but not an objective (e.g., housing, income security and labour markets) where the issue is about how sector-specific objectives can be achieved at the same time as avoidable mortality is reduced.

The following key features of the health policy and system context in Canada will also be taken into account in preparation of this issue brief:

- the Canadian health system is comprised of 13 publicly financed healthcare systems (10 provincial and three territorial); and
- most provinces have devolved decisions relating to the planning, funding and integration of healthcare to regional health authorities, and the number of regional health authorities and the types of decisions that each are allowed to make vary by province (although some provinces, such as Alberta and Prince Edward Island, have ‘re-centralized’ decision-making).

## **THE PROBLEM**

There is as yet limited use of the avoidable mortality indicator by governments, supported agencies and health councils in Canada.

A jurisdictional scan of Canadian organizations and agencies that report on performance indicators reveals that there is limited reporting about the avoidable mortality indicator among provincial/territorial governments or provincial health quality councils (Table 4). Reporting on avoidable mortality generally appears to be restricted to CIHI and Statistics Canada nationally, and the Institute for Clinical and Evaluative Sciences (ICES) provincially. It is worth noting, however, that one regional health authority in Saskatchewan – the Sun Country Health Region – reports on avoidable mortality.<sup>(45)</sup> In contrast, a number of jurisdictions outside Canada report on the avoidable mortality indicator.

With limited reporting about the avoidable mortality indicator there is likely to be limited monitoring of the indicator and use of the indicator in decision-making. But why has there been so little attention given to reporting, monitoring and using this indicator in decision-making?

The reasons behind the limited use of the avoidable mortality indicator in Canada can perhaps best be understood by considering three sets of inter-related issues: 1) limited awareness, understanding or agreement about the usefulness of the avoidable mortality indicator; 2) limited research evidence to inform decision-making about prevention and treatment that could reduce avoidable mortality rates and/or limited use of the available research evidence; and 3) lack of incorporation of the indicator into performance measurement and management systems. We address each of the issues in turn below.

### **Box 3: Mobilizing research evidence about the problem**

The available research evidence about the problem was sought from a range of published and “grey” research literature sources. Published literature that provided insights into alternative ways of framing the problem was sought using the qualitative research “hedge” in MedLine. Grey literature was sought by reviewing the websites of a number of Canadian and international organizations, such as the Canadian Institute for Health Information, Statistics Canada and the Institute for Clinical and Evaluative Sciences.

Priority was given to research evidence that was published more recently, that was locally applicable (in the sense of having been conducted in Canada), and that took equity considerations into account.

Table 4 presents the results of a jurisdictional scan conducted in 2011 by the Canadian Institute for Health Information (CIHI) to examine reporting about the avoidable mortality indicator among Canadian federal, provincial and territorial governments, supported agencies, and health councils. The list of governments, agencies and health councils included in the jurisdictional scan is adapted from Figure 1 of a Health Council of Canada report (Health Council of Canada. Measuring and Reporting on Health System Performance in Canada: Opportunities for Improvement. Toronto, Ontario: Health Council Canada; 2012). Note that although this figure included a fourth category of think tanks and organizations, CIHI considered these organizations to be out of scope. The list of governments, agencies and health councils examined is not exhaustive and the search did not extend to a comprehensive search of regional health authority or public health unit websites.

**Table 4:** Reporting about the avoidable mortality indicator across Canada (as of 2011)

Type of government, agency or health council	Name of government department, agency or health council	Reporting on avoidable mortality indicator			
		Yes	No	Unknown*	
Federal governments and supported agencies	Health Canada		✓**		
	Canadian Institute for Health Information	✓			
	Canadian Patient Safety Institute		✓**		
	Public Health Agency of Canada		✓**		
	Statistics Canada	✓			
	Canadian Partnership Against Cancer		✓**		
Provincial/territorial governments and supported agencies	Provincial/territorial ministries of health	British Columbia Ministry of Health Services		✓	
		Alberta Health		✓	
		Saskatchewan Health		✓	
		Manitoba Health			✓
		Ontario Ministry of Health and Long-Term Care		✓	
		Quebec Ministère de la Santé et des Services sociaux		✓	
		New Brunswick Department of Health		✓	
		Nova Scotia Department of Health		✓	
		Prince Edward Island Department of Health		✓	
		Newfoundland and Labrador Health and Community Services		✓	
		Nunavut Department of Health and Social Services		✓	
		Northwest Territories Department of Health and Social Services			✓
	Yukon Department of Health and Social Services			✓	
Provincial/territorial governments and supported agencies	Alberta Diabetes Surveillance System		✓**		
	Cancer Care Ontario/Cancer Quality Council of Ontario		✓		
	Cardiac Care Network (ON)		✓**		
	Institute for Clinical Evaluative Sciences (ON)	✓			
	Manitoba Centre for Health Policy		✓		
	Newfoundland and Labrador Centre for Health Information		✓**		
	Saskatchewan Population Health and Evaluation Research Unit		✓**		
National/provincial health councils	Health Council of Canada		✓**		
	British Columbia Patient Safety and Quality Council		✓**		
	Health and Welfare Commissioner (QC)		✓		
	Health Quality Council of Alberta		✓**		
	Health Quality of Ontario		✓**		
	Manitoba Centre for Health Policy		✓		
	New Brunswick Health Council		✓		
	Saskatchewan Health Quality Council		✓		

\*Unclear what indicators are included in a performance indicator reporting system, or no performance measurement indicators developed yet \*\*Nothing of note was found for these organizations

Source: Canadian Institute for Health Information

### **Limited awareness, understanding or agreement about the usefulness of the indicator**

The concept of avoidable mortality is still relatively new in Canada, and the use of the avoidable mortality indicator for performance reporting, monitoring and decision-making is even newer. Policymakers may simply be unaware of the indicator and its potential uses. If they are aware of the indicator, they may not fully understand it (although as we outlined previously its understandability is greater than many indicators) or agree about its potential usefulness (although, again as we outlined previously, it does offer a number of very practical uses).

### **Limited (use of) research evidence to inform decision-making about prevention and treatment**

We have come a long way in the availability of effectiveness information (and to a lesser extent cost-effectiveness information) about primary prevention programs (which could reduce the incidence of disease) and about secondary prevention programs and treatment programs (which could reduce case fatality). McMaster PLUS and health-evidence.ca, for example, contain thousands of systematic reviews about the effectiveness of such programs. However, there is very little context-specific, decision-relevant information to inform discussion about the pros and cons of addressing preventable versus treatable mortality, addressing preventable mortality through the health system versus through the social determinants of health, or alternative approaches to addressing inequities across geographical regions and between different groups. Moreover, even if such information were readily available, we know that research evidence competes with many other factors in the decision-making process, and that research evidence often isn't valued, isn't relevant to the particular decisions being faced, and isn't easy to use.

### **Lack of incorporation of the indicator into performance measurement and management systems**

Current health system arrangements do not adequately support a focus on the use of the avoidable mortality indicator. In terms of delivery arrangements, existing performance measurement systems (e.g., system-level report cards) and performance management systems (e.g., accountability agreements with regional health authorities) have not yet been updated to include the avoidable mortality indicator, as they have been in countries like Australia. System-wide policy evaluations in Canada have also not yet started to use the avoidable mortality indicator, unlike in some other countries such as Italy.<sup>(46)</sup> In terms of financial arrangements, existing funding and remuneration systems (for organizations such as hospitals and providers such as physicians, respectively) have not yet begun to incorporate the avoidable mortality indicator. Lastly, in terms of governance arrangements, ministries of health across the country have not yet started to use the avoidable mortality indicator as a focus in their stewardship role, and governments across the country have historically put in place few or time-limited mechanisms to support intersectoral action regardless of the indicators being used (although there are exceptions, such as Quebec's mandatory health impact assessments for policies that have health consequences, not health objectives).<sup>(47)</sup>

### **Additional equity-related observations about the problem**

As we have already described, avoidable mortality in Canada appears to disproportionately affect some groups, such as low socioeconomic status populations. As the *Health Indicators 2012* report showed, avoidable mortality rates are consistently higher amongst those from the least affluent neighbourhoods compared to those from the most affluent neighbourhoods.<sup>(1)</sup> Moreover the report indicates a possible interaction between socioeconomic status and sex. But our question here is whether the problem of the limited use of the avoidable mortality indicator disproportionately affects low socioeconomic status populations and minority ethnocultural groups, which many would deem particularly unfair or unjust. Certain data limitations currently preclude reporting about the avoidable mortality indicator among First Nations and Inuit populations,<sup>(1)</sup> and reporting is a first, necessary step on the path towards use. Moreover, the research evidence currently available to inform decision-making about prevention and treatment is often not specific to low socioeconomic status populations and minority ethnocultural groups, and most performance measurement and management systems in the country do not adopt an overarching equity lens

that focuses on these populations and groups.(48;49) Keeping them in mind when monitoring the avoidable mortality indicator and making decisions based on this indicator will be made all the more difficult by these limitations in our evidence base and our performance measurement and management systems.

### **THREE ELEMENTS OF A COMPREHENSIVE APPROACH FOR ADDRESSING THE PROBLEM**

Many approaches could be selected as a starting point for deliberations about building momentum for using the avoidable mortality indicator in Canada. To promote discussion about the pros and cons of different ways forward, we have selected three elements of a potentially viable approach to address the limited use of the avoidable mortality indicator in reporting, monitoring and decision-making. These elements are: 1) increase dialogue about the avoidable mortality indicator and its potential uses; 2) support informed decision-making about prevention and treatment programs; and 3) incentivize actions that prioritize investments in prevention versus treatment, addressing particular conditions or addressing particular inequities.

These three elements were identified and selected through a process of consultation with the Steering Committee and with key informants. The elements were not designed to be mutually exclusive. They could be pursued simultaneously or sequentially, or components could be drawn from each element to create a new (fourth) element. They are presented separately to foster deliberations about their respective components, the relative importance or priority of each, their interconnectedness and potential of (or need for) sequencing, and their feasibility.

In the following section of the issue brief, we review available data and research evidence about each element in turn. Our review yielded little data and research evidence dealing specifically with the avoidable mortality indicator. However, we included data and research evidence that could provide relevant insights and spur reflection about each element as it could pertain to supporting the use of the indicator.

#### **Box 4: Mobilizing research evidence about elements of a comprehensive approach for addressing the problem**

The available research evidence about elements of a comprehensive approach for addressing the problem was sought primarily from Health Systems Evidence ([www.healthsystemsevidence.org](http://www.healthsystemsevidence.org)), which is a continuously updated database containing more than 2,700 systematic reviews of delivery, financial and governance arrangements within health systems. The reviews were identified by searching the database for reviews addressing features of the option elements. The corresponding taxonomy elements are available upon request.

The authors' conclusions were extracted from the reviews whenever possible. Some reviews concluded that there was substantial uncertainty about the elements based on the identified studies. Where relevant, caveats were introduced about these authors' conclusions based on assessments of the reviews' quality, the local applicability of the reviews' findings, equity considerations, and relevance to the issue. (See the appendices for a complete description of these assessments.)

Being aware of what is not known can be as important as being aware of what is known. When faced with substantial uncertainty or concerns about quality and local applicability, or a lack of attention to equity considerations, primary research could be commissioned or an element could be pursued and a monitoring and evaluation plan designed as part of its implementation. When faced with a review that was published many years ago, an updating of the review could be commissioned if time allows.

No additional research evidence was sought beyond what was included in the systematic review. Those interested in pursuing a particular element may want to search for a more detailed description of the element, or for additional research evidence about the element.

## **Element 1 – Increase dialogue about the avoidable mortality indicator and its potential uses**

This element involves increasing dialogue about the avoidable mortality indicator and its potential uses. The sub-elements might include:

- educating health system policymakers and managers about the avoidable mortality indicator, the need for continued/expanded data collection if the indicator's usefulness is to be optimized, the indicator's potential uses in reporting, monitoring and decision-making, and the indicator's implications for accountability at the population level;
- educating health professionals about the avoidable mortality indicator and its potential as a focus for accountability at the population level;
- educating policymakers, managers and professionals in other sectors about the avoidable mortality indicator and its potential as a focus for accountability at the population level; and
- educating the public about the avoidable mortality indicator and its potential as a focus for accountability at the population level.

While we have used the term 'educating' for all of these sub-elements, we adopted a holistic view of the term so that it could incorporate a range of interventions, ranging from (for example) more didactic approaches to more deliberative approaches, that could support informed dialogue about the indicator. And while we have used the term 'health professionals' in the second sub-element, it is health professional leaders that are likely to have the most to contribute to and gain from such dialogue.

A basic assumption underlying this element is that the limited use of the avoidable mortality indicator can be explained, in part, by the limited awareness, understanding or agreement about the usefulness of this indicator. Increasing dialogue about the avoidable mortality indicator and its potential uses could help to answer questions about whether this indicator should be used in reporting, monitoring and decision-making.

We found no systematic reviews that addressed the sub-elements focused on educating health system policymakers and managers, or on educating policymakers, managers and professionals in other sectors. We return to the issue of supporting health system policymakers and managers in the next section, albeit with a focus on supporting their use of research evidence and not raising awareness, enhancing understanding or exploring potential agreement about the usefulness of an indicator. However, there may be lessons to be drawn from experiences with the 'hospital standardized mortality ratio' in Canada, particularly in terms of whether education was what supported its use, or whether reporting about the indicator triggered self-directed learning among health system policymakers and managers.

We found several systematic reviews examining various educational interventions targeting health professionals (sub-element 2) that could spur reflection about how to educate them about the avoidable mortality indicator and thereby foster dialogue about the indicator in this group. This appears particularly important in light of a review suggesting that many quality improvement curricula for physicians inadequately address quality improvement educational objectives and have relatively weak research quality.<sup>(50)</sup> Several reviews found benefits for educational interventions including educational outreach,<sup>(51)</sup> printed materials (e.g., manuals, bulletins, guidelines, quick reference guides, newsletters and consensus statements),<sup>(51;52)</sup> morbidity and mortality review conferences,<sup>(53)</sup> and other continuing medical education activities (e.g., conferences, workshops and rounds).<sup>(54-56)</sup> In general, didactic teaching methods appear less effective in educating health professionals <sup>(54;56)</sup> than educational interventions offering the opportunity to practice skills,<sup>(54;55)</sup> to discuss in small groups,<sup>(56)</sup> or to be coached.<sup>(56)</sup> Lastly, there appears to be limited high-quality research evidence about the effectiveness of educational interventions, such as cultural competency training, aimed at health professionals to improve the quality of care for ethnocultural minorities, which is one of the two prioritized groups in this issue brief.<sup>(57;58)</sup>

We found one high-quality (but old) systematic review that examined the effectiveness of mass-media interventions targeting the public (sub-element 4), however, the outcome studied was health service utilization



and not support for accountability at the population level.(59) The review revealed that planned mass media campaigns and unplanned mass media coverage can have a positive influence on the utilization of health services. However, this review found limited evidence to draw firm conclusions about the characteristics of successful mass media campaigns, and notably about how messages should be framed.

The key findings from the available synthesized research evidence are provided in Table 5 for those who want additional detail about the research evidence from which the above points were drawn. For those who want to know even more about the systematic reviews contained in Table 5 (or obtain citations for the reviews), a fuller description of the systematic reviews is provided in Appendix 1.

**Table 5:** Summary of key findings from systematic reviews relevant to Element 1 - Increase dialogue about the avoidable mortality indicator and its potential uses

Category of finding	Summary of key findings
Benefits	<ul style="list-style-type: none"> <li>• <b>Educating health professionals about the avoidable mortality indicator and its potential as a focus for accountability at the population level</b> <ul style="list-style-type: none"> <li>○ A recent and medium-quality review exploring the methodological rigour of quality improvement curricula for physician trainees found that many curricula inadequately address quality improvement educational objectives and have relatively weak research quality.(50)</li> <li>○ Several reviews, including recent and high-quality reviews, found benefits for the following educational interventions targeting health professionals:                             <ul style="list-style-type: none"> <li>▪ multifaceted interventions (e.g., educational outreach with distribution of printed materials, audit and feedbacks, coaching and others);(51;55;56;60)</li> <li>▪ continuing medical education activities (e.g., conferences, workshops and rounds) based on interactive small-group case discussions (54;56) or with the capacity to practice skills;(55)</li> <li>▪ morbidity and mortality review conferences;(53) and</li> <li>▪ printed educational materials (e.g., manuals, bulletins, guidelines, quick reference guides, newsletters and consensus statements).(52)</li> </ul> </li> <li>○ Three reviews found that didactic teaching methods appear less effective to educate health professionals.(54-56)</li> </ul> </li> <li>• <b>Educating the public about the avoidable mortality indicator and its potential as a focus for accountability at the population level</b> <ul style="list-style-type: none"> <li>○ A high-quality but old review found that all of the studies (which were of variable quality) apart from one concluded that planned mass media campaigns and unplanned mass media coverage can have a positive influence on the utilization of health services. However, the authors could not draw firm conclusions about the characteristics of successful mass media campaigns and how messages should be framed.(59)</li> </ul> </li> </ul>
Potential harms	<ul style="list-style-type: none"> <li>• None of the identified reviews provided information about potential harms of the sub-elements</li> </ul>
Costs and/or cost-effectiveness in relation to the status quo	<ul style="list-style-type: none"> <li>• No reviews evaluated costs and/or cost-effectiveness in relation to the status quo</li> </ul>
Uncertainty regarding benefits and potential harms (so monitoring and evaluation could be warranted if the option element were pursued)	<ul style="list-style-type: none"> <li>• Uncertainty because no systematic reviews were identified             <ul style="list-style-type: none"> <li>○ <b>Educating health system policymakers and managers about the avoidable mortality indicator, the need for continued/expanded data collection, the indicator’s potential uses, and its implications for accountability at the population level</b></li> <li>○ <b>Educating policymakers, managers and professionals in other sectors about the avoidable mortality indicator and its potential as a focus for accountability at the population level</b></li> </ul> </li> <li>• Uncertainty because no studies were identified despite an exhaustive search as part of a systematic review             <ul style="list-style-type: none"> <li>○ Not applicable (no ‘empty’ reviews were found)</li> </ul> </li> <li>• No clear message from studies included in a systematic review             <ul style="list-style-type: none"> <li>○ <b>Educating health professionals about the avoidable mortality indicator and its potential as a focus for accountability at the population level</b> <ul style="list-style-type: none"> <li>▪ Two recent reviews (one of high-quality and one of medium-quality) found limited evidence of benefits for interventions to improve healthcare quality for racial/ethnic minorities,(57) including cultural competency training.(58)</li> <li>▪ A recent and high-quality review found limited evidence to reliably estimate the effect</li> </ul> </li> </ul> </li> </ul>

*Building Momentum in Using the Avoidable Mortality Indicator in Canada*

	of printed materials on patient outcomes or its effect in comparison to other educational interventions.(52)
Key sub-elements of the policy option element if it was tried elsewhere	<ul style="list-style-type: none"><li>• None of the identified reviews provided information about key sub-elements</li></ul>
Stakeholders' views and experience	<ul style="list-style-type: none"><li>• None of the identified reviews provided information about stakeholders' views and preferences about the sub-elements</li></ul>

## Element 2 – Support informed decision-making about prevention and treatment programs

This element involves supporting informed decision-making about prevention and treatment programs. The sub-elements might include:

- developing a package of tools and resources that position the avoidable mortality indicator in the context of a suite of indicators that address both mortality and morbidity, have particular relevance at different levels of the system, change at different speeds, provide different types of insights about the potential causes of changes, and reflect changes in different ways (e.g., leading or trailing indicators);
- investing in data collection that provide the types of information needed in decision-making (e.g., broken down by key groups), resolve methodological disagreements about the avoidable mortality indicator, and incorporate the indicator in existing performance-measurement systems; and
- funding, synthesizing, disseminating and supporting the use of research evidence about the prevention and treatment initiatives that would have the greatest impacts on the avoidable mortality indicator.

A basic assumption underlying this element is that to increase the use of the avoidable mortality indicator, particularly in decision-making (as opposed to reporting and monitoring), there is a need to build the capacity of health system policymakers and stakeholders to use the indicator, typically by providing information, tools and resources that can support their decision-making about prevention and treatment programs.

We found no systematic reviews that addressed developing a package of tools and resources that could position an indicator like the avoidable mortality indicator in the context of a suite of indicators (sub-element 1) or that addressed investing in data collection, resolving methodological disagreements or incorporating an indicator in existing performance-measurement systems (sub-element 2). However, such practical ‘how to’ issues are rarely the focus of research studies (and hence systematic reviews), but very amenable to the type of deliberative dialogue that this issue brief is meant to inform. To inform the deliberation about the use of the avoidable mortality indicator in performance-measurement systems, CIHI conducted an international scan to identify examples of such efforts in other countries and found the following (personal communication).

- Australia’s National Healthcare Agreement performance framework, agreed by the Council of Australian Governments in 2008 and updated in August 2011, includes the avoidable mortality indicator as part of a suite of performance indicators, and specifically within the outcome domain ‘Australians receive appropriate high quality and affordable primary and community health services.’<sup>(61)</sup>
- The New Zealand Ministry of Health uses the avoidable mortality indicator, as well as its components amenable and preventable mortality, as a measure of quality of health system performance.<sup>(62)</sup> Avoidable mortality data have been calculated for each of four (north, midland, central and south) regions,<sup>(63)</sup> and variation in amenable mortality has also been analyzed for New Zealand from 1996-2006 and across New Zealand District Health Boards for the period 2001-2004.<sup>(64)</sup>
- The U.K.’s National Health Service uses the avoidable mortality indicator (in the form of potential years of life lost from causes amenable to healthcare) as an overarching indicator in their Outcomes Framework 2012/2013, within the domain ‘preventing people from dying prematurely.’ Under this domain are specific improvement areas such as reducing premature (under 75) mortality from major causes of death (cardiovascular, respiratory and liver diseases, as well as cancer), reducing premature death among people with severe mental illness, and reducing deaths in babies and young children.<sup>(65)</sup>

We found several systematic reviews about funding, synthesizing, disseminating and supporting the use of research evidence (and typically research evidence in the form of systematic reviews) (sub-element 3). While the reviews found insufficient evidence about the effectiveness of strategies for encouraging the use of research evidence by health system policymakers and managers, one review identified several supportive conditions for evidence use: when there is a single clear message, the change is relatively simple to accomplish, and there is a growing awareness by users of the evidence that a change in practice is required.<sup>(66)</sup> Several reviews outlined details on stakeholders’ views about barriers (e.g., lack of awareness and familiarity, a lack of usefulness, a lack of motivation, and other external barriers) and facilitators (e.g., facilitating interactions

between the users and producers of research evidence, ensuring timely access to research evidence, and adapting and presenting the findings in formats more directly tailored to their needs) to the use of research evidence.(67-72) Many of these issues will be relevant to the challenging task of supporting health system policymakers and managers in using research evidence about prevention and treatment initiatives that would have the greatest impacts on the avoidable mortality indicator. One example of another consideration is whether incorporating research evidence about prevention and treatment into interactive micro-simulation models would assist health system policymakers and stakeholders in working through the trade-offs involved in selecting different options.

For those who want additional detail about the synthesized research evidence from which the above points were drawn, the key findings are provided in Table 6. For those who want to know more about the systematic reviews contained in Table 6 (or obtain citations for the reviews), a fuller description of the systematic reviews is provided in Appendix 2.

**Table 6:** Summary of key findings from systematic reviews relevant to Element 2 - Support informed decision-making about prevention and treatment programs

Category of finding	Summary of key findings
Benefits	<ul style="list-style-type: none"> <li>• <b>Funding, synthesizing, disseminating and supporting the use of research evidence about the prevention and treatment initiatives that would have the greatest impacts on the avoidable mortality indicator</b> <ul style="list-style-type: none"> <li>○ A recent and high-quality review found that information products designed to support the uptake of systematic review evidence were effective under certain conditions: there is a single clear message, the change is relatively simple to accomplish, and there is a growing awareness by users of the evidence that a change in practice is required.(66)</li> </ul> </li> <li>• <b>Investing in data collection that provide the types of information needed in decision-making (e.g., broken down by key groups), resolve methodological disagreements about the avoidable mortality indicator, and incorporate the indicator in existing performance-measurement systems</b> <ul style="list-style-type: none"> <li>○ A recent and low-quality review examining health information exchange in primary care practices found that such systems are effective in improving access to test results and other data from outside the practice, and decreasing staff time for handling referrals and claims processing.(73)</li> </ul> </li> </ul>
Potential harms	<ul style="list-style-type: none"> <li>• <b>Investing in data collection that provide the types of information needed in decision-making (e.g., broken down by key groups), resolve methodological disagreements about the avoidable mortality indicator, and incorporate the indicator in existing performance-measurement systems</b> <ul style="list-style-type: none"> <li>○ A recent and low-quality review examining health information exchange in primary care practices revealed privacy and liability concerns.(73)</li> </ul> </li> </ul>
Costs and/or cost-effectiveness in relation to the status quo	<ul style="list-style-type: none"> <li>• No reviews evaluated costs and/or cost-effectiveness in relation to the status quo</li> </ul>
Uncertainty regarding benefits and potential harms (so monitoring and evaluation could be warranted if the option element were pursued)	<ul style="list-style-type: none"> <li>• Uncertainty because no systematic reviews were identified <ul style="list-style-type: none"> <li>○ <b>Developing a package of tools and resources that position the avoidable mortality indicator in the context of a suite of indicators that address both mortality and morbidity, have particular relevance at different levels of the system, change at different speeds, provide different types of insights about the potential causes of changes, and reflect changes in different ways (e.g., leading or trailing indicators)</b></li> </ul> </li> <li>• Uncertainty because no studies were identified despite an exhaustive search as part of a systematic review <ul style="list-style-type: none"> <li>○ Not applicable (no ‘empty’ reviews were found)</li> </ul> </li> <li>• No clear message from studies included in a systematic review <ul style="list-style-type: none"> <li>○ <b>Investing in data collection that provide the types of information needed in decision-making (e.g., broken down by key groups), resolve methodological disagreements about the avoidable mortality indicator, and incorporate the indicator in existing performance-measurement systems</b> <ul style="list-style-type: none"> <li>▪ A recent and low-quality review examining health information exchange in primary care practices found limited evidence of its effects on cost savings, workflow efficiency and quality.(73)</li> </ul> </li> <li>○ <b>Funding, synthesizing, disseminating and supporting the use of research evidence</b></li> </ul> </li> </ul>

	<p><b>about the prevention and treatment initiatives that would have the greatest impacts on the avoidable mortality indicator</b></p> <ul style="list-style-type: none"> <li>▪ Several systematic reviews, including one recent and high-quality review, evaluated strategies and interventions for encouraging the use of research evidence (mostly systematic reviews) by health policymakers and managers, and each have found insufficient evidence to draw conclusions about the effectiveness of interventions that have been designed for this purpose.(66;74-77) However, a recent but low-quality review found some evidence to suggest that tailored targeted messages combined with access to registries of research evidence may increase the use of research evidence in policymaking.(75) The same review also found a lack of evidence to support the effectiveness of knowledge brokers.</li> </ul>
<p>Key sub-elements of the policy option element if it was tried elsewhere</p>	<ul style="list-style-type: none"> <li>• <b>Funding, synthesizing, disseminating and supporting the use of research evidence about the prevention and treatment initiatives that would have the greatest impacts on the avoidable mortality indicator</b> <ul style="list-style-type: none"> <li>○ A recent but low-quality review found that providing training in the appraisal of research and its use may increase participants’ skills in critical appraisal and possibly their perceptions about using it (but not their use of it).(75)</li> </ul> </li> </ul>
<p>Stakeholders’ views and experience</p>	<ul style="list-style-type: none"> <li>• <b>Funding, synthesizing, disseminating and supporting the use of research evidence about the prevention and treatment initiatives that would have the greatest impacts on the avoidable mortality indicator</b> <ul style="list-style-type: none"> <li>○ Several systematic reviews have investigated the barriers and facilitators for policymakers’ and stakeholders’ use of research evidence.(67-71) The most commonly cited factors that increase their use of research evidence are facilitating interactions between the users and producers of research evidence, and ensuring timely access to research evidence. Other barriers include a lack of awareness and familiarity, a lack of usefulness, a lack of motivation, and other external barriers.</li> <li>○ A recent and medium-quality review exploring knowledge translation resources and tools to maximize the impact of systematic reviews in healthcare decision-making revealed that such barriers may be overcome by adapting and presenting the findings in formats more directly tailored to their needs (e.g., providing summaries, overviews and policy briefs added value to systematic reviews, or evaluating their methodological quality and the applicability of the findings to particular settings).(72)</li> </ul> </li> </ul>

### **Element 3 – Incentivize actions that prioritize investments in prevention versus treatment, addressing particular conditions or addressing particular inequities**

This element involves incentivizing actions that prioritize investments in prevention versus treatment (or more accurately investments that provide a better balance between prevention and treatment), addressing particular conditions or addressing particular inequities. The sub-elements might include:

- re-orienting existing performance-management systems to focus, at least in part, on the avoidable mortality indicator and the prevention versus treatment imbalances (and related intersectoral action), conditions and inequities that this indicator brings to light;
- re-orienting existing impact evaluations (including sectors where health is an explicit objective and sectors where health is a potential consequence but not an objective) to focus, at least in part, on the avoidable mortality indicator and the prevention versus treatment imbalances (and related intersectoral action), conditions and inequities that this indicator brings to light; and
- publicly reporting on actions that prioritize investments in prevention versus treatment (and related intersectoral action), addressing particular conditions or addressing particular inequities.

This element assumes that re-orienting existing performance-management systems and impact evaluations, as well as greater public reporting, could create tangible incentives for actions that prioritize investments in areas brought to light by the avoidable mortality indicator.

We found one systematic review that has relevance to re-orienting existing performance-management systems (sub-element 1). The review examined performance measurement and improvement frameworks within and across the health, education and social service systems. The review identified 16 quality concepts applicable to informing the development of cross-sectoral quality improvement frameworks.<sup>(78)</sup> Examples of such concepts include: 1) linkages and partnerships among systems, networks and providers; 2) commitment to a continuous learning environment; and 3) use of strategic planning processes to be responsive to change and to achieve sustainable success. To inform the deliberation about the use of the avoidable mortality indicator in performance-management systems, CIHI also looked for examples of such efforts in other countries in its international scan, however, it found only one such example (personal communication): The U.K.'s National Health Service (NHS) Commissioning Board is “expected to focus on improving mortality in all the components of amenable mortality as well as the overall rate,” with certain improvement areas (such as reducing premature mortality from cardiovascular, respiratory and liver diseases) as a shared responsibility with Public Health England.<sup>(79)</sup>

We found no systematic reviews that addressed the re-orienting of existing impact evaluations (sub-element 2).

We found several systematic reviews that addressed public reporting (sub-element 3), although most were about public reporting on healthcare topics that would have high salience for healthcare consumers, which is arguably quite different from public reporting about a broad health indicator that is likely to be seen as having less immediate relevance to the public. One review revealed that quality measures that are publicly reported are likely to improve over time.<sup>(80)</sup> Other reviews found that public reporting can stimulate activity to improve quality at the hospital level,<sup>(81)</sup> improve certain outcomes (e.g., patient satisfaction and caesarean delivery rates),<sup>(82)</sup> and improve consumers' knowledge about and attitude towards the use of quality information.<sup>(83)</sup> However, there was inconsistent or limited evidence regarding the effects of public reporting on changing consumer behaviours or improving care,<sup>(81;84)</sup> on patient safety, health outcomes and patient-centredness of care,<sup>(81)</sup> and on mortality rates.<sup>(80)</sup> There was also inconsistent evidence about whether public reporting created incentives leading to unintended negative behaviours by providers such as ‘cherry picking’ patients or changing ratings by manipulating their patient populations.<sup>(80)</sup> One review found that public reporting can widen racial disparities in healthcare use,<sup>(85)</sup> but another found inconsistent evidence about the effects of public reporting on access to healthcare.<sup>(80)</sup> Lastly, one review highlighted that successful public reporting programs should be embedded in ongoing relationship-building efforts with target audiences that aim to clearly understand their information needs, identify how they use information, and educate them about the

value and meaning of the information.(86) More directly salient examples of public reporting, such as the equity audits and whole-of-government reporting at the sub-national level in some European countries, have not been the focus of systematic reviews, but they are amenable to the type of deliberative dialogue that this issue brief is meant to inform.

Again, for those who want additional detail about the research evidence from which the above points were drawn, the key findings from the available synthesized research evidence is provided in Table 7. For those who want to know more about the systematic reviews contained in Table 7 (or obtain citations for the reviews), a fuller description of the systematic reviews is provided in Appendix 3.

**Table 7:** Summary of key findings from systematic reviews relevant to Element 3 - Incentivize actions that prioritize investments in prevention versus treatment, addressing particular conditions or addressing particular inequities

Category of finding	Summary of key findings
Benefits	<ul style="list-style-type: none"> <li>• <b>Publicly reporting on actions that prioritize investments in prevention versus treatment (and related intersectoral action), addressing particular conditions or addressing particular inequities</b> <ul style="list-style-type: none"> <li>○ Three reviews, including two medium- and high-quality reviews, found the following benefits of public reporting:                             <ul style="list-style-type: none"> <li>▪ publicly-reported quality measures are likely to improve over time;(80)</li> <li>▪ it stimulated activities to improve quality at the hospital level;(81)</li> <li>▪ it improved knowledge about and attitude towards the use of quality information;(83) and</li> <li>▪ it has a small but increasing impact on consumers’ decision-making.(82)</li> </ul> </li> </ul> </li> </ul>
Potential harms	<ul style="list-style-type: none"> <li>• <b>Publicly reporting on actions that prioritize investments in prevention versus treatment (and related intersectoral action), addressing particular conditions or addressing particular inequities</b> <ul style="list-style-type: none"> <li>○ One recent and medium-quality review found that public reporting may have a widening effect on racial disparities in healthcare,(85) but another recent and high-quality review found inconsistent evidence about the effects of public reporting on access to care.(80)</li> </ul> </li> </ul>
Costs and/or cost-effectiveness in relation to the status quo	<ul style="list-style-type: none"> <li>• No reviews evaluated costs and/or cost-effectiveness in relation to the status quo</li> </ul>
Uncertainty regarding benefits and potential harms (so monitoring and evaluation could be warranted if the option element were pursued)	<ul style="list-style-type: none"> <li>• Uncertainty because no systematic reviews were identified             <ul style="list-style-type: none"> <li>○ <b>Re-orienting existing impact evaluations (including sectors where health is an explicit objective and sectors where health is a potential consequence but not an objective) to focus, at least in part, on the avoidable mortality indicator and the prevention versus treatment imbalances (and related intersectoral action), conditions and inequities that this indicator brings to light</b></li> </ul> </li> <li>• Uncertainty because no studies were identified despite an exhaustive search as part of a systematic review             <ul style="list-style-type: none"> <li>○ Not applicable (no ‘empty’ reviews were found)</li> </ul> </li> <li>• No clear message from studies included in a systematic review             <ul style="list-style-type: none"> <li>○ <b>Publicly reporting on actions that prioritize investments in prevention versus treatment (and related intersectoral action), addressing particular conditions or addressing particular inequities</b> <ul style="list-style-type: none"> <li>▪ Three systematic reviews (one of medium-quality and two of high-quality) found inconsistent or limited evidence about the effects of public reporting on:                             <ul style="list-style-type: none"> <li>▪ consumer, professional and organizational behaviours;(80;84)</li> <li>▪ safety;(81)</li> <li>▪ patient-centredness;(81;82)</li> <li>▪ access to care (e.g., unintended consequences like cherry-picking patients or changing ratings by manipulating their patient populations),(80) although another review suggested that it may have a widening effect on racial disparities in healthcare;(85) and</li> <li>▪ mortality rates.(80)</li> </ul> </li> </ul> </li> </ul> </li> </ul>
Key elements of the policy option element if it was tried elsewhere	<ul style="list-style-type: none"> <li>• <b>Re-orienting existing performance management systems to focus, at least in part, on the avoidable mortality indicator and the prevention versus treatment imbalances (and related intersectoral action), conditions and inequities that this indicator brings to light</b> <ul style="list-style-type: none"> <li>○ A recent and medium-quality review examining performance measurement and improvement</li> </ul> </li> </ul>

	<p>frameworks within and across sectors (i.e., health, education and social services) identified 16 quality concepts to inform the development of cross-sectoral quality improvement frameworks. The quality concepts were grouped into five categories: collaboration, learning and innovation, management perspective, service provision and outcomes.(78)</p> <ul style="list-style-type: none"> <li>• <b>Publicly reporting on actions that prioritize investments in prevention versus treatment (and related intersectoral action), addressing particular conditions or addressing particular inequities</b> <ul style="list-style-type: none"> <li>○ An older and low-quality review examining the effectiveness of public reporting practices on the quality of healthcare found that simply releasing reports into the public realm is insufficient to achieve both accountability and quality. It is essential that any public reporting initiative be embedded in ongoing efforts of relationship building with the diverse audiences, trying to clearly understand their information needs and how they use such information, and educating them about the value and meaning of the information.(86)</li> </ul> </li> </ul>
Stakeholders' views and experience	<ul style="list-style-type: none"> <li>• <b>Publicly reporting on actions that prioritize investments in prevention versus treatment (and related intersectoral action), addressing particular conditions or addressing particular inequities</b> <ul style="list-style-type: none"> <li>○ An older and medium-quality review examining the effects of pay-for-performance and public reporting on racial disparities in healthcare revealed that leaders of major performance incentive programs in the United States believed that current programs were not designed to reduce disparities, and often lack characteristics that may be important in reducing disparities (e.g., collecting race and ethnicity data, emphasizing conditions of higher prevalence in minorities, rewarding improvement, and encouraging nationally prominent organizations to establish disparity guidelines and/or measures).(85)</li> <li>○ An older and low-quality review exploring the evidence about the public release of performance data revealed that, while hospitals may be responsive to publicly reported information, consumers and providers rarely search out this type of information and do not understand or trust it.(82)</li> </ul> </li> </ul>

### **Additional equity-related observations about the elements**

In our review of the research evidence, we found few systematic reviews dealing explicitly with the two sub-populations prioritized in this issue brief (i.e., low socioeconomic status populations and minority ethnic groups). An older and medium-quality systematic review identified for the third element – incentivizing actions – examined the effects of pay-for-performance and public reporting on racial disparities in healthcare.(85) The review explored to what extent and how performance incentive programs caused physicians and organizations to ‘cherry pick’ patients (i.e., select patients who may help them score well or avoid those who may cause them to score poorly), and whether such programs may widen the resource gap that exists between healthcare organizations that serve large numbers of patients from racial minorities and organizations that do not. The review found evidence of a major public reporting program increasing disparities in coronary artery bypass graft rates. The review was complemented by the views of leaders of major performance incentive programs in the United States who indicated that current programs were not designed to reduce disparities and often lacked the key characteristics to reduce such disparities. They highlighted the need to systematically collect race and ethnicity data, to emphasize conditions of higher prevalence in minorities, to reward improvement, and to encourage nationally prominent organizations to establish disparity guidelines and/or measures.(85) There are promising examples of such work in the Canadian context, such as the University Health Network’s collection of data about many of the PROGRESS domains (Box 2).



## **IMPLEMENTATION CONSIDERATIONS**

Given that the potential facilitators to action often seem more self-evident than the potential barriers, and that some barriers may be so important that they force a re-evaluation of whether a particular way forward is even worth serious discussion at a particular moment in time, we focus here initially on the potential barriers to building momentum for using the avoidable mortality indicator in Canada. Barriers can be identified at the level of citizens (e.g., low levels of literacy to interpret the avoidable mortality indicator and public concerns about prioritizing investments in prevention over treatment when treatment is perceived as such a pressing concern), providers (e.g., concerns about being held accountable for avoidable mortality caused by factors beyond their control), organizations (e.g., inability to see the value in using the avoidable mortality indicator within an organization), and systems (e.g., disinterest in macro-level indicators that do not provide actionable messages). A detailed list of potential barriers to implementing the three elements is provided in Table 8 as a way to spur reflection about some of the considerations that may influence choices about an optimal way forward. We found few empirical studies that helped to identify or establish the importance of these barriers, so we have listed those that were identified in a range of sources (not just empirical studies) and we have not rank ordered them in any way. Indeed, for element 1 the barriers at the level of citizens may be much less germane than the barriers at other levels (given that the indicator could have little direct salience to them), whereas for elements 2 and especially 3 the barriers at the level of citizens may be much more germane than the barriers at other levels (given that action based on the indicator could involve changing the balance in investments between prevention and treatment).

**Table 8:** Potential barriers to implementing the elements

<b>Levels</b>	<b>Element 1 – Increase dialogue about the avoidable mortality indicator and its potential uses</b>	<b>Element 2 – Support informed decision-making about prevention and treatment programs</b>	<b>Element 3 – Incentivize actions that prioritize investments in prevention versus treatment, addressing particular conditions or addressing particular inequities</b>
<b>Citizens</b>	<ul style="list-style-type: none"> <li>• The public may have limited interest in or ability to fully understand a complex health indicator like avoidable mortality, especially those with low levels of health literacy and with limited access to information and communication technology</li> </ul>	<ul style="list-style-type: none"> <li>• The public may resist decisions that are based on research evidence and not their collective values and preferences</li> <li>• The public may share certain expectations that are more aligned with a medical treatment model than a mixed prevention/treatment model (87)</li> </ul>	<ul style="list-style-type: none"> <li>• The public may share certain expectations that are more aligned with a medical treatment model than a mixed prevention/treatment model (87)</li> <li>• The public may not search out publicly released information and may have difficulties in interpreting it or knowing whether to trust it (82)</li> </ul>
<b>Service provider</b>	<ul style="list-style-type: none"> <li>• Some providers may be concerned about being held accountable for avoidable mortality that is caused by factors beyond their sphere of influence</li> <li>• Some providers may not see the value of the avoidable mortality indicator to guide their work</li> <li>• Some providers may lack the skills required to interpret and appropriately apply the avoidable mortality indicator</li> </ul>	<ul style="list-style-type: none"> <li>• Some providers may give priority to medical treatment at the expense of population-based prevention</li> </ul>	<ul style="list-style-type: none"> <li>• Some providers may give priority to medical treatment at the expense of population-based prevention</li> </ul>
<b>Organization</b>	<ul style="list-style-type: none"> <li>• Some organizations may not see the value of the avoidable mortality indicator to guide their work at various levels in the system</li> </ul>	<ul style="list-style-type: none"> <li>• Some organizations may be concerned about being held accountable for avoidable mortality that is caused by</li> </ul>	<ul style="list-style-type: none"> <li>• Organizations with no long-term funding may be unable to make commitments to prioritize investments in prevention</li> </ul>

	<ul style="list-style-type: none"> <li>• Some organizations may be concerned about being held accountable for avoidable mortality that is caused by factors beyond their sphere of influence</li> <li>• Some organizations with frequent staff turnover may not see value in investing in education and training about the indicator and its potential uses, especially those with limited resources</li> </ul>	<p>factors beyond their sphere of influence</p> <ul style="list-style-type: none"> <li>• Some organizations may lack the leadership or resources to implement the necessary data collection</li> <li>• Some organizations may be reluctant to share data from their performance-measurement systems if it incorporates the avoidable mortality indicator</li> </ul>	<p>versus treatment, addressing particular conditions or addressing particular inequities</p> <ul style="list-style-type: none"> <li>• Organizations that make commitments may encounter difficulties in implementing them</li> <li>• Some organizations may be reluctant to publicly release avoidable mortality data</li> <li>• Organizations may face difficulties in developing a shared vision for publicly reporting avoidable mortality data and tailoring the available data to their local context</li> </ul>
<b>System</b>	<ul style="list-style-type: none"> <li>• Some policymakers may not be interested in or not willing to use macro-level indicators that do not provide actionable messages</li> <li>• Policymakers may have varying appetites for avoidable mortality depending on the election cycle in their respective jurisdictions</li> <li>• Policymakers and stakeholders may be concerned about being held accountable for avoidable mortality that is caused by factors beyond their sphere of influence</li> <li>• Policymakers and stakeholders may face difficulties in developing a shared vision for public education and mass media campaigns about the avoidable mortality indicator, and in tailoring messages to local contexts</li> <li>• Policymakers may have difficulty in achieving coherence among provinces and territories in the use of the avoidable mortality indicator and its implications</li> </ul>	<ul style="list-style-type: none"> <li>• Some policymakers may be reluctant to share avoidable mortality data with other jurisdictions</li> <li>• Policymakers may face technical, cost, privacy and liability concerns when setting up a comprehensive data collection system</li> <li>• Policymakers may have difficulty in achieving coherence among provinces and territories in the data collection and evidence supports that provide the types of information needed in decision-making within the health sector and across sectors</li> </ul>	<ul style="list-style-type: none"> <li>• Policymakers may have varying appetites for avoidable mortality depending on the election cycle in their respective jurisdictions</li> <li>• Policymakers may face difficulties in shifting priorities (and funds) because such shifts may affect the resources and incentives of various stakeholders</li> <li>• Policymakers may have difficulty in achieving coherence among provinces and territories in the nature of the investments that are required</li> <li>• Policymakers may be unwilling or uninterested in making long-term financial commitments to addressing priority areas brought to light by the avoidable mortality indicator</li> </ul>

The implementation of the three elements of a potential approach to address the problem can be influenced by policymakers' and stakeholders' capacity to take advantage of potential windows of opportunity. These windows of opportunity could facilitate or trigger the use of the avoidable mortality indicator in Canada. For instance, several Canadian jurisdictions and organizations have an integrated strategic planning approach and have established comprehensive performance-measurement systems that could benefit from aggregate measures like the avoidable mortality indicator. The avoidable mortality indicator could thus be integrated into a suite of indicators during the periodic reviews of existing performance measurement and management systems at the provincial/territorial, regional and professional levels. In addition, re-negotiations of existing financial arrangements at the provincial, regional and professional levels (e.g., annual provincial budget-setting exercises, periodic accountability agreement re-negotiations with regional health authorities, and periodic contract negotiations with medical associations) could also constitute other windows of opportunity to build momentum on the use of the avoidable mortality indicator. Furthermore, it could be possible to build momentum during the strategic planning cycles at the organizations involved in funding, synthesizing and supporting the use of data and research evidence. Lastly, another window of opportunity could be the planned visits of individuals from other countries, such as Australia, New Zealand and the United Kingdom, who are using the avoidable mortality indicator and have lessons to share.

## REFERENCES

1. Canadian Institute for Health Information. Health Indicators 2012. Ottawa, Canada: Canadian Institute for Health Information; 2012.
2. Weeks C. Avoidable deaths plummet - but not for those in low-income areas. The Globe and Mail 2012 May 24; Available from: <http://www.theglobeandmail.com/life/health-and-fitness/avoidable-deaths-plummet---but-not-for-those-in-low-income-areas/article4209639/>
3. CBC News. Avoidable death rate falls sharply. CBC News 2012 May 24; Available from: <http://www.cbc.ca/news/health/story/2012/05/24/deaths-avoidable.html>
4. Mercier J. Décès évitables: deux régions, deux constats différents. Le Droit 2012 May 24; Available from: <http://www.lapresse.ca/le-droit/actualites/sante/201205/25/01-4528566-deces-evitables-deux-regions-deux-constats-differents.php>
5. Radio-Canada. Les décès évitables en baisse au Canada. Radio-Canada 2012 May 24; Available from: <http://www.radio-canada.ca/nouvelles/sante/2012/05/24/001-rapport-icis-mortalite-evitable.shtml>
6. Alfonso SJ, Sanchis NB, Prado del Bano MJ, Sabater PA, Saiz SC, Cortina GP. Testing a new health indicator: Using avoidable causes of death and life expectancy for Spain between 1975-1986. European Journal of Epidemiology 1993;9(1):33-9.
7. Klazinga N, Fischer C, ten Asbroek A. Health services research related to performance indicators and benchmarking in Europe. Journal of Health Services Research and Policy 2011;16 Suppl 2:38-47.
8. Donabedian A. Explorations in Quality Assessment and Monitoring: Vol. 1 The Definition of Quality and Approaches to its Assessment. Ann Arbor, USA: Health Administration Press; 1980.
9. Donabedian A. Explorations in Quality Assessment and Monitoring. Vol. 2. The Criteria and Standards of Quality. Ann Arbor, USA: Health Administration Press; 1982.
10. Donabedian A. Explorations in Quality Assessment and Monitoring: Vol. 3 The Methods and Findings of Quality Assessment and Monitoring-An Illustrated Analysis. Ann Arbor, USA: Health Administration Press; 1985.
11. Holland WW. The "avoidable death" guide to Europe. Health Policy 1986;6(2):115-7.
12. Mant J. Process versus outcome indicators in the assessment of quality of health care. International Journal for Quality and Health Care 2001;13(6):475-80.
13. Westerling R. Trends in "avoidable" mortality in Sweden, 1974-85. Journal of Epidemiology and Community Health 1992;46(5):489-93.
14. Westerling R. Commentary: Evaluating avoidable mortality in developing countries - An important issue for public health. International Journal of Epidemiology 2001;30(5):973-5.
15. Rutstein DD, Berenberg W, Chalmers TC, Child CG, III, Fishman AP, Perrin EB. Measuring the quality of medical care: A clinical method. New England Journal of Medicine 1976;294(11):582-8.
16. Charlton JR, Hartley RM, Silver R, Holland WW. Geographical variation in mortality from conditions amenable to medical intervention in England and Wales. Lancet 1983;1(8326 Pt 1):691-6.
17. Nolte E, McKee CM. Does Health Care Save Lives? Avoidable Mortality Revisited. London, United Kingdom: Nuffield Trust; 2004.
18. Rutstein DD, Berenberg W, Chalmers TC, Fishman AP, Perrin EB, Zuidema GD. Measuring the quality of medical care: Second revision of tables of indexes. New England Journal of Medicine 1980;302(20):1146.
19. Adler GS. Measuring the quality of medical care. New England Journal of Medicine 1978;298(10):574.

20. Poikolainen K, Eskola J. The effect of health services on mortality: Decline in death rates from amenable and non-amenable causes in Finland, 1969-81. *Lancet* 1986;1(8474):199-202.
21. Poikolainen K, Eskola J. Health services resources and their relation to mortality from causes amenable to health care intervention: A cross-national study. *International Journal of Epidemiology* 1988;17(1):86-9.
22. Holland W. *European Community Atlas of 'Avoidable Death'*. 3 ed. Oxford, United Kingdom: Oxford University Press; 1988.
23. Mackenbach JP, Looman CW, Kunst AE, Habbema JD, van der Maas PJ. Post-1950 mortality trends and medical care: Gains in life expectancy due to declines in mortality from conditions amenable to medical intervention in the Netherlands. *Social Science and Medicine* 1988;27(9):889-94.
24. McDermott W. Absence of indicators of the influence of its physicians on a society's health: Impact of physician care on society. *American Journal of Medicine* 1981;70(4):833-43.
25. Simonato L, Ballard T, Bellini P, Winkelmann R. Avoidable mortality in Europe 1955-1994: A plea for prevention. *Journal of Epidemiology and Community Health* 1998;52(10):624-30.
26. Tobias M, Jackson G. Avoidable mortality in New Zealand, 1981-97. *Australian and New Zealand Journal of Public Health* 2001;25(1):12-20.
27. Holland WW. Commentary: Should we not go further than descriptions of avoidable mortality? *International Journal of Epidemiology* 2003;32(3):447-8.
28. Charlton JR, Velez R. Some international comparisons of mortality amenable to medical intervention. *British Medical Journal* 1986;292(6516):295-301.
29. Kjellstrand CM, Kovithavongs C, Szabo E. On the success, cost and efficiency of modern medicine: An international comparison. *Journal of Internal Medicine* 1998;243(1):3-14.
30. Mackenbach JP, Bouvier-Colle MH, Jouglu E. "Avoidable" mortality and health services: A review of aggregate data studies. *Journal of Epidemiology and Community Health* 1990;44(2):106-11.
31. Stevens G, Mathers C. Avoidable mortality - A tool for policy evaluation in developing countries? *European Journal of Public Health* 2010;20(3):241-2.
32. Heijink R, Koolman X, Westert GP. Spending more money, saving more lives? The relationship between avoidable mortality and healthcare spending in 14 countries. *European Journal of Health Economics* 2012.
33. Kossarova L, Holland W, Mossialos E. 'Avoidable' mortality: A measure of health system performance in the Czech Republic and Slovakia between 1971 and 2008. *Health Policy and Planning* 2012.
34. Pampalon R. Avoidable mortality in Quebec and its regions. *Social Science and Medicine* 1993;37(6):823-31.
35. James PD, Wilkins R, Detsky AS, Tugwell P, Manuel DG. Avoidable mortality by neighbourhood income in Canada: 25 years after the establishment of universal health insurance. *Journal of Epidemiology and Community Health* 2007;61(4):287-96.
36. Wood E, Sallar AM, Schechter MT, Hogg RS. Social inequalities in male mortality amenable to medical intervention in British Columbia. *Social Science and Medicine* 1999;48(12):1751-8.
37. James PD, Manuel DG, Mao Y. Avoidable mortality across Canada from 1975 to 1999. *BMC Public Health* 2006;6:137.
38. Mustard CA, Bielecky A, Etches J, Wilkins R, Tjepkema M, Amick BC et al. Avoidable mortality for causes amenable to medical care, by occupation in Canada, 1991-2001. *Canadian Journal of Public Health* 2010;101(6):500-6.

39. Manuel DG, Mao Y. Avoidable mortality in the United States and Canada, 1980-1996. *American Journal of Public Health* 2002;92(9):1481-4.
40. Canadian Institute for Health Information. Personal communication with CIHI staff on 6 March 2013. Hamilton, Canada: McMaster Health Forum; 2013.
41. Statistics Canada. *Canadian Vital Statistics (1979-2008)*. Ottawa, Canada: Statistics Canada; 2013.
42. Statistics Canada. Data tables, maps and fact sheets. Statistics Canada 2012; Available from: <http://www.statcan.gc.ca/pub/82-221-x/2012002/tbl-eng.htm>
43. Health Council of Canada. *A Citizen's Guide to Health Indicators: A Reference Guide for Canadians*. Toronto, Canada: Health Council of Canada; 2011.
44. Health Canada. *Healthy Canadians - A Federal Report on Comparable Health Indicators 2010*. Ottawa, Canada: Health Canada; 2011.
45. Sun Country Health Region. *Annual Report 2011-12*. Weyburn, Canada: Sun Country Health Region; 2012.
46. Quercioli C, Messina G, Basu S, McKee M, Nante N, Stuckler D. The effect of healthcare delivery privatisation on avoidable mortality: Longitudinal cross-regional results from Italy, 1993-2003. *Journal of Epidemiology and Community Health* 2012.
47. Public Health Act, R.S.Q. c. S-2.2, c.60 a.54, Quebec's National Assembly, (2001).
48. Canadian Institute for Health Information. *Developing a Model for Measuring the Efficiency of the Health System in Canada - Policy Review Summary*. Ottawa, Canada: Canadian Institute for Health Information; 2012.
49. Lavis JN, Wilson M, Grignon M. *Issue Brief: Measuring Health System Efficiency in Canada*. Hamilton, Canada: McMaster Health Forum; 2011.
50. Windish DM, Reed DA, Boonyasai RT, Chakraborti C, Bass EB. Methodological rigor of quality improvement curricula for physician trainees: A systematic review and recommendations for change. *Academic Medicine* 2009;84(12):1677-92.
51. O'Brien MA, Rogers S, Jamtvedt G, Oxman AD, Odgaard-Jensen J, Kristoffersen DT et al. Educational outreach visits: Effects on professional practice and health care outcomes. *Cochrane Database of Systematic Reviews* 2007;(4):CD000409.
52. Giguère A, Legare F, Grimshaw J, Turcotte S, Fiander M, Grudniewicz A et al. Printed educational materials: Effects on professional practice and healthcare outcomes. *Cochrane Database of Systematic Reviews* 2012;10:CD004398.
53. Bal G, David S, Sellier E, Francois P. Value of morbidity and mortality review conferences for physician education and improvement of care quality and safety: A literature review. *Presse Médicale* 2010;39(2):161-8.
54. Davis D, O'Brien MA, Freemantle N, Wolf FM, Mazmanian P, Taylor-Vaisey A. Impact of formal continuing medical education: Do conferences, workshops, rounds, and other traditional continuing education activities change physician behavior or health care outcomes? *Journal of the American Medical Association* 1999;282(9):867-74.
55. Davis DA, Thomson MA, Oxman AD, Haynes RB. Changing physician performance: A systematic review of the effect of continuing medical education strategies. *Journal of the American Medical Association* 1995;274(9):700-5.
56. Scott I. What are the most effective strategies for improving quality and safety of health care? *Internal Medicine Journal* 2009;39(6):389-400.

57. Beach MC, Gary TL, Price EG, Robinson K, Gozu A, Palacio A et al. Improving health care quality for racial/ethnic minorities: A systematic review of the best evidence regarding provider and organization interventions. *BMC Public Health* 2006;6(104).
58. Lie DA, Lee-Rey E, Gomez A, Berekyei S, Braddock CH, III. Does cultural competency training of health professionals improve patient outcomes? A systematic review and proposed algorithm for future research. *Journal of General Internal Medicine* 2011;26(3):317-25.
59. Grilli R, Ramsay C, Minozzi S. Mass media interventions: Effects on health services utilisation. *Cochrane Database of Systematic Reviews* 2002;(1):CD000389.
60. de Vos M, Graafmans W, Kooistra M, Meijboom B, Van D, V, Westert G. Using quality indicators to improve hospital care: A review of the literature. *International Journal of Quality in Health Care* 2009;21(2):119-29.
61. National Healthcare Agreement Review Working Group. National Healthcare Agreement Review Report. Canberra, Australia: Council of Australian Governments; 2012.
62. Ministry of Health. Annual Report for the Year Ended 30 June 2011: Including the Director-General of Health's Annual Report on the State of Public Health. Wellington, New Zealand: Ministry of Health; 2011.
63. Ministry of Health. An Indication of New Zealanders' Health 2007. Wellington, New Zealand: Minister of Health; 2007.
64. Ministry of Health. Saving Lives: Amenable Mortality in New Zealand, 1996-2006. Wellington, New Zealand: Ministry of Health; 2010.
65. Department of Health. The NHS Outcomes Framework 2012/13: At a Glance. London, United Kingdom: Department of Health; 2011.
66. Murthy L, Shepperd S, Clarke MJ, Garner SE, Lavis JN, Perrier L et al. Interventions to improve the use of systematic reviews in decision-making by health system managers, policy makers and clinicians. *Cochrane Database of Systematic Reviews* 2012;9:CD009401.
67. Innvaer S, Vist GE, Trommald M, Oxman AD. Health policy-makers' perceptions of their use of evidence: A systematic review. *Journal of Health Services Research and Policy* 2002;7(4):239-44.
68. Lavis JN, Hammill AC, Gildiner A, McDonagh RJ, Wilson MG, Ross SE et al. A Systematic Review of the Factors that Influence the Use of Research Evidence by Public Policymakers. Final report submitted to the Canadian Population Health Initiative. 2005.
69. Lavis JN, Davies HTO, Oxman AD, Denis J-L, Golden-Biddle K, Ferlie E. Towards systematic reviews that inform health care management and policy-making. *Journal of Health Services Research and Policy* 2005;10(Supplement 1):S1:35-S1:48.
70. Orton L, Lloyd-Williams F, Taylor-Robinson D, O'Flaherty M, Capewell S. The use of research evidence in public health decision making processes: Systematic review. *PLoS ONE* 2011;6(7):e21704-DOI:10.1371/journal.pone.0021704.
71. Wallace J, Nwosu B, Clarke M. Barriers to the uptake of evidence from systematic reviews and meta-analyses: A systematic review of decision makers' perceptions. *BMJ Open* 2012;2(5).
72. Chambers D, Wilson PM, Thompson CA, Hanbury A, Farley K, Light K. Maximizing the impact of systematic reviews in health care decision making: A systematic scoping review of knowledge-translation resources. *Milbank Quarterly* 2011;89(1):131-56.
73. Fontaine P, Ross SE, Zink T, Schilling LM. Systematic review of health information exchange in primary care practices. *Journal of the American Board of Family Medicine* 2010;23(5):655-70.

74. Bunn F, Sworn K. Strategies to promote the impact of systematic reviews on healthcare policy: A systematic review of the literature. *Evidence & Policy* 2011;7(4):403-28.
75. Moore G, Redman S, Haines M, Todd A. What works to increase the use of research in population health policy and programmes: A review. *Evidence & Policy* 2011;7(3):277-305.
76. Perrier L, Mrklas K, Lavis J, Straus S. Interventions encouraging the use of systematic reviews by health policymakers and managers: A systematic review. *Implementation Science* 2011;6(1):43.
77. Mitton C, Adair CE, McKenzie E, Patten SB, Wayne Perry B. Knowledge transfer and exchange: Review and synthesis of the literature. *Milbank Quarterly* 2007;85(4):729-68.
78. Klassen A, Miller A, Anderson N, Shen J, Schiariti V, O'Donnell M. Performance measurement and improvement frameworks in health, education and social services systems: A systematic review. *International Journal of Quality in Health Care* 2010;22(1):44-69.
79. Department of Health. Developing the NHS Commissioning Board. London, United Kingdom: Department of Health; 2011.
80. Totten A, Wagner J, Tiwari A, O'Haire C, Griffin J, Walker M. Closing the Quality Gap: Revisiting the State of the Science - Public Reporting as a Quality Improvement Strategy. Rockville, USA: Oregon Evidence-based Practice Center, Agency for Healthcare Research and Quality (US); 2012.
81. Fung CH, Lim YW, Mattke S, Damberg C, Shekelle PG. Systematic review: The evidence that publishing patient care performance data improves quality of care. *Annals of Internal Medicine* 2008;148(2):111-23.
82. Marshall MN, Shekelle PG, Leatherman S, Brook RH. The public release of performance data: What do we expect to gain? A review of the evidence. *Journal of the American Medical Association* 2000;283(14):1866-74.
83. Faber M, Bosch M, Wollersheim H, Leatherman S, Grol R. Public reporting in health care: How do consumers use quality-of-care information? A systematic review. *Medical Care* 2009;47(1):1-8.
84. Ketelaar NA, Faber MJ, Flottorp S, Rygh LH, Deane KH, Eccles MP. Public release of performance data in changing the behaviour of healthcare consumers, professionals or organisations. *Cochrane Database of Systematic Reviews* 2011;(11):CD004538.
85. Chien AT, Chin MH, Davis AM, Casalino LP. Pay for performance, public reporting, and racial disparities in health care: How are programs being designed? *Medical Care Research and Review* 2007;64(5 Suppl):283S-304S.
86. Wallace J, Teare GF, Verrall T, Chan BTB. Public Reporting on the Quality of Healthcare: Emerging Evidence on Promising Practices for Effective Reporting. Ottawa, Canada: Canadian Health Services Research Foundation; 2007.
87. Lemstra M, Neudorf C, Beaudin G. Health disparity knowledge and support for intervention in Saskatoon. *Canadian Journal of Public Health* 2007;98(6):484-8.





## APPENDICES

The following tables provide detailed information about the systematic reviews identified for each option. Each row in a table corresponds to a particular systematic review and the reviews are organized by option element (first column). The focus of the review is described in the second column. Key findings from the review that relate to the option are listed in the third column, while the fourth column records the last year the literature was searched as part of the review.

The fifth column presents a rating of the overall quality of the review. The quality of each review has been assessed using AMSTAR (A MeaSurement Tool to Assess Reviews), which rates overall quality on a scale of 0 to 11, where 11/11 represents a review of the highest quality. It is important to note that the AMSTAR tool was developed to assess reviews focused on clinical interventions, so not all criteria apply to systematic reviews pertaining to delivery, financial, or governance arrangements within health systems. Where the denominator is not 11, an aspect of the tool was considered not relevant by the raters. In comparing ratings, it is therefore important to keep both parts of the score (i.e., the numerator and denominator) in mind. For example, a review that scores 8/8 is generally of comparable quality to a review scoring 11/11; both ratings are considered “high scores.” A high score signals that readers of the review can have a high level of confidence in its findings. A low score, on the other hand, does not mean that the review should be discarded, merely that less confidence can be placed in its findings and that the review needs to be examined closely to identify its limitations. (Lewin S, Oxman AD, Lavis JN, Fretheim A. SUPPORT Tools for evidence-informed health Policymaking (STP): 8. Deciding how much confidence to place in a systematic review. *Health Research Policy and Systems* 2009; 7 (Suppl1):S8).

The last three columns convey information about the utility of the review in terms of local applicability, applicability concerning prioritized groups, and issue applicability. The third-from-last column notes the proportion of studies that were conducted in Canada, while the second-from-last column comments on the proportion of studies included in the review that deal explicitly with one of the prioritized groups. The last column indicates the review’s issue applicability in terms of the proportion of studies focused on avoidable mortality.

All of the information provided in the appendix tables was taken into account by the issue brief’s authors in compiling Tables 5-7 in the main text of the brief.

**Appendix 1: Systematic reviews relevant to Element 1 - Increase dialogue about the avoidable mortality indicator and its potential uses**

Subelement	Focus of systematic review	Key findings	Year of last search	AMSTAR (quality) rating	Proportion of studies that were conducted in Canada	Proportion of studies that deal explicitly with one of the prioritized groups	Proportion of studies that focused on avoidable mortality
Educating health system policymakers and managers about the avoidable mortality indicator, the need for continued/expanded data collection, the indicator's potential uses, and its implications for accountability at the population level	No reviews identified						
Educating health professionals about the avoidable mortality indicator and its potential as a focus for accountability at the population level	Examining the effectiveness of cultural competency training of health professionals in improving patient outcomes (58)	The review found limited research evidence showing a positive relationship between cultural competency training and improved patient outcomes. None of the research evidence identified was deemed to be of high quality.	2010	8/10 (AMSTAR rating from Program in Policy Decision-making)	Not reported in detail	5/7	0/7

McMaster Health Forum

Subelement	Focus of systematic review	Key findings	Year of last search	AMSTAR (quality) rating	Proportion of studies that were conducted in Canada	Proportion of studies that deal explicitly with one of the prioritized groups	Proportion of studies that focused on avoidable mortality
	Examining the effectiveness of different quality improvement strategies for optimizing healthcare (56)	<p>Clinician-/patient-driven QIS were associated with greater effectiveness than manager-/policymaker-driven QIS. The most effective strategies included clinician-directed audit and feedback cycles, clinical decision support systems, specialty outreach programs, chronic disease management programs, continuing professional education based on interactive small-group case discussions, and patient-mediated clinician reminders.</p> <p>Formal teaching in evidence-based medicine, integrated with clinical coaching, can modestly improve knowledge, skills, attitudes and behaviour of clinicians compared with traditional medical training.</p> <p>Small group case-based workshops provided moderately large changes in professional practice compared to little change seen in didactic teaching methods.</p>	2008	2/11 (AMSTAR rating from Program in Policy Decision-making)	12/97	0/97	0/97
	Examining the effectiveness of strategies for implementing quality indicators in improving quality of hospital care (60)	<p>Effective interventions for implementing quality indicators appear to utilize audit and feedback combined with other implementation strategies such as clinician education components and an overall quality improvement plan. Studies that did not use feedback reports or only feedback reports were less effective.</p> <p>Barriers to implementation</p>	2008	3/9 (AMSTAR rating from Program in Policy Decision-making)	1/21	0/21	0/21

*Building Momentum in Using the Avoidable Mortality Indicator in Canada*

Subelement	Focus of systematic review	Key findings	Year of last search	AMSTAR (quality) rating	Proportion of studies that were conducted in Canada	Proportion of studies that deal explicitly with one of the prioritized groups	Proportion of studies that focused on avoidable mortality
		reported were a lack of leadership and a lack of resources.					
	Exploring the methodological rigour of quality improvement curricula for physician trainees (50)	Many QI curricula for physician trainees inadequately address QI educational objectives and have relatively weak research quality.	2008	7/11 (AMSTAR rating from Program in Policy Decision-making)	0/18	0/18	0/18
	Examining the effectiveness of formal continuing medical education (CME) (e.g., conferences, workshops, rounds and other traditional continuing education activities) on physician behaviour or healthcare outcomes (54)	There is some evidence that interactive CME sessions that enhance participant activity and provide the opportunity to practice skills can effect change in professional practice and, on occasion, healthcare outcomes.  Didactic sessions do not appear to be effective in changing physician performance.	1999	5/11 (AMSTAR rating from Program in Policy Decision-making)	3/14	0/14	0/14
	Examining the effectiveness of continuing medical education (CME) strategies in changing physician performance (55)	Effective change strategies included reminders, patient-mediated interventions, outreach visits, opinion leaders and multifaceted activities. Audit with feedback and educational materials were less effective, and formal CME conferences or activities, without enabling or practice-reinforcing strategies, had relatively little impact.  More effective methods, such as systematic practice-based interventions and outreach visits, are seldom used by CME providers.	1994	2/10 (AMSTAR rating from Program in Policy Decision-making)	Not reported in detail	0/99	0/99

McMaster Health Forum

Subelement	Focus of systematic review	Key findings	Year of last search	AMSTAR (quality) rating	Proportion of studies that were conducted in Canada	Proportion of studies that deal explicitly with one of the prioritized groups	Proportion of studies that focused on avoidable mortality
	Examining the value of morbidity and mortality (M&M) review conferences for physician education and improvement of care quality and safety (53)	M&M conferences in this study showed good physician participation and a wide variety of types of meeting organization. The effectiveness of M&M conferences was not reported on.	2008	Not yet available	Not reported in detail	0/17	0/17
	Examining the effectiveness of different types of educational materials (e.g., manuals, bulletins, guidelines, quick reference guides, newsletters, consensus statements), distribution audiences (e.g., targeted or general audiences), format (e.g., colourful vs. black and white) and frequency of distribution (52)	When used alone and compared to no intervention, printed educational materials may have a small beneficial effect on professional practice outcomes. There is little evidence to reliably estimate the effect of printed materials on patient outcomes or its effect in comparison to other educational interventions.	2011	10/11 (AMSTAR rating from Program in Policy Decision-making)	12/45	0/45	0/45
	Examining the effectiveness of interventions to improve healthcare quality for racial/ethnic minorities (57)	Positive results were found in studies that utilized a provider reminder system for provision of standardized services (mostly preventive as well as quality improvement strategies that bypassed the physician to offer preventive services directly to patients), provider education alone, a structured questionnaire (to assess adolescent health behaviours), and remote simultaneous translation. The effectiveness and effect size of these interventions to improve quality for racial/ethnic minorities needs further investigation.	2003	7/11 (AMSTAR rating from Program in Policy Decision-making)	0/27	27/27	0/27
	Examining the effectiveness of educational outreach visits on professional practice and healthcare outcomes (51)	Multifaceted interventions that included educational outreach and distribution of educational materials and/or other intervention compared to a control group, compared to audit and feedback	2007	8/11 (AMSTAR rating from www.rxforchange.ca)	1/69	0/69	0/69

*Building Momentum in Using the Avoidable Mortality Indicator in Canada*

Subelement	Focus of systematic review	Key findings	Year of last search	AMSTAR (quality) rating	Proportion of studies that were conducted in Canada	Proportion of studies that deal explicitly with one of the prioritized groups	Proportion of studies that focused on avoidable mortality
		<p>and compared to educational materials were all found to be generally effective for improving appropriate care.</p> <p>Educational outreach interventions used alone compared to a control group, and compared to educational materials were found to be generally effective.</p> <p>There was insufficient evidence for comparisons of multifaceted vs. educational meetings, educational outreach visits versus continuity of care, and multifaceted versus reminders.</p>					
Educating policymakers, managers and professionals in other sectors about the avoidable mortality indicator and its potential as a focus for accountability at the population level	No reviews identified						
Educating the public about the avoidable mortality indicator and its potential as a focus for accountability at the population level	Examining the effects of mass media on the utilization of health services (59)	A high-quality but old review found that all of the studies (which were of variable quality) apart from one concluded that planned mass media campaigns and unplanned mass media coverage could have a positive influence on the utilization of health services.	1999	10/11 (AMSTAR rating from <a href="http://www.rxforchange.ca">www.rxforchange.ca</a> )	1/20	0/20	0/20

**Appendix 2: Systematic reviews relevant to Element 2 – Support informed decision-making about prevention and treatment programs**

Subelement	Focus of systematic review	Key findings	Year of last search	AMSTAR (quality) rating	Proportion of studies that were conducted in Canada	Proportion of studies that deal explicitly with one of the prioritized groups	Proportion of studies that focused on avoidable mortality
Developing a package of tools and resources that position the avoidable mortality indicator in the context of a suite of indicators that address both mortality and morbidity, have particular relevance at different levels of the system, change at different speeds, provide different types of insights about the potential causes of changes, and reflect changes in different ways (e.g., leading or trailing indicators)	No reviews identified						
Investing in data systems that provide the types of information needed in decision-making (e.g., broken down by key groups), resolve methodological disagreements about the avoidable mortality indicator, and incorporate the indicator in existing performance-measurement systems	No reviews identified						
Funding, synthesizing, disseminating and supporting the implementation of research evidence about the prevention and treatment initiatives that would have	Examining the effects of information products designed to support the uptake of systematic review evidence by health system managers, policymakers and healthcare professionals (66)	Mass mailing a printed bulletin which summarizes systematic review evidence may improve evidence-based practice when there is a single clear message, if the change is relatively simple to accomplish, and there is a growing	2011	9/10 (AMSTAR rating from Program in Policy Decision-making)	1/8	0/8	0/8

*Building Momentum in Using the Avoidable Mortality Indicator in Canada*

Subelement	Focus of systematic review	Key findings	Year of last search	AMSTAR (quality) rating	Proportion of studies that were conducted in Canada	Proportion of studies that deal explicitly with one of the prioritized groups	Proportion of studies that focused on avoidable mortality
the greatest impacts on the avoidable mortality indicator		awareness by users of the evidence that a change in practice is required. If the intention is to develop awareness and knowledge of systematic review evidence, and the skills for implementing this evidence, a multifaceted intervention that addresses each of these aims may be required. However, there is insufficient evidence to support this approach.					
	Exploring the barriers to the uptake of evidence from systematic reviews and meta-analyses from the decision-makers' perspective (71)	This systematic review revealed that strategies to improve the uptake of evidence from reviews and meta-analyses will need to overcome a wide variety of obstacles. The review described the reasons why knowledge users, especially physicians, do not call on systematic reviews, such as lack of use, lack of awareness, lack of access, lack of familiarity, lack of usefulness, lack of motivation, and external barriers.	2010	7/10 (AMSTAR rating from Program in Policy Decision-making)	5/27	0/27	0/27
	Exploring knowledge translation resources and tools to maximize the impact of systematic reviews in healthcare decision-making (72)	This systematic scoping review identified knowledge-translation resources that address barriers to the use of systematic reviews by policymakers. These barriers may be overcome by resources that adapt and present the findings in formats more directly tailored to their needs. Knowledge-translation resources, including summaries, overviews, and policy briefs, added value to systematic reviews. They did this by, for example, evaluating their methodological quality or assessing the reliability of their	2009	5/9 (AMSTAR rating from Program in Policy Decision-making)	5/20	0/20	0/20



McMaster Health Forum

Subelement	Focus of systematic review	Key findings	Year of last search	AMSTAR (quality) rating	Proportion of studies that were conducted in Canada	Proportion of studies that deal explicitly with one of the prioritized groups	Proportion of studies that focused on avoidable mortality
		conclusions or their generalizability to particular settings. More evaluations of these resources are required to ensure users' needs are being met, to justify their funding, and to demonstrate their impact.					
	Interventions encouraging the use of systematic reviews by health policymakers and managers (76)	There is insufficient evidence to draw conclusions about the effectiveness of interventions that encourage health policymakers and managers to use systematic reviews in decision-making.	2010	9/10 (AMSTAR rating from Program in Policy Decision-making)	3/3	0/3	0/3
	To identify and evaluate potential strategies for increasing the impact of systematic reviews on policy (74)	Facilitators for the use of systematic reviews included involving policymakers in the review process, making reviews relevant to local settings and contexts, collaboration between researchers and policymakers, and disseminating results from systematic reviews in user-friendly formats	2011	5/9 (AMSTAR rating from Program in Policy Decision-making)	7/13	0/13	0/13
	Increasing the use of research in population health policy and programs (75)	There is little evidence about which strategies increase the use of evidence in population health policy and programs.  There is some evidence that tailored targeted messages combined with access to registries of research evidence may increase the use of research evidence in policy development.  None of the included studies provided evidence that interaction between researchers and policymakers has an impact on the	2011	3/9 (AMSTAR rating from Program in Policy Decision-making)	Not reported in detail	0	0

*Building Momentum in Using the Avoidable Mortality Indicator in Canada*

Subelement	Focus of systematic review	Key findings	Year of last search	AMSTAR (quality) rating	Proportion of studies that were conducted in Canada	Proportion of studies that deal explicitly with one of the prioritized groups	Proportion of studies that focused on avoidable mortality
		<p>use of research evidence.</p> <p>Training in the appraisal of research and its use appears to increase participants' skills in critical appraisal and possibly their perceptions about the value of research (but not their use).</p> <p>One study evaluated the impact of using knowledge brokers, but did not find evidence to support their effectiveness.</p>					
	The use of research evidence in public health decision-making processes (70)	<p>Barriers to the use of research evidence included: decision-makers' perceptions of research evidence; the gulf between researchers and decision-makers; the culture of decision-making; competing influences on decision-making; and practical constraints.</p> <p>Mechanisms of overcoming barriers to research use were suggested in many studies, but were largely untested. They include research targeted at the needs of decision-makers, research clearly highlighting key messages, and capacity building.</p> <p>Minimal evidence on the role of research evidence in decision-making to reduce inequalities was identified.</p>	2010	7/10 (AMSTAR rating from Program in Policy Decision-making)	7/18	0/18	0/18
	Identifying the factors that influence the use of research evidence in ways to improve the usefulness of systematic reviews	Interactions between researchers and healthcare policymakers and timing/timeliness appear to increase the prospects for research	2008	No rating tool available for this type of document	Not reported in detail	0/17	0/17

McMaster Health Forum

Subelement	Focus of systematic review	Key findings	Year of last search	AMSTAR (quality) rating	Proportion of studies that were conducted in Canada	Proportion of studies that deal explicitly with one of the prioritized groups	Proportion of studies that focused on avoidable mortality
	for healthcare managers and policymakers (68;69)	<p>use among policymakers.</p> <p>Interviews with healthcare managers and policymakers suggest that they would benefit from having information that is relevant for decisions highlighted for them (e.g. contextual factors that affect a review's local applicability and information about the benefits, harms/risks and costs of interventions), and having reviews presented in a way that allows for rapid scanning for relevance and then graded entry (such as one page of take-home messages, a three-page executive summary and a 25-page report).</p> <p>Managers and policymakers have mixed views about the helpfulness of recommendations.</p> <p>An analysis of websites found that contextual factors were rarely highlighted, recommendations were often provided, and graded entry formats were rarely used.</p>					
	To summarize the evidence from interview studies of facilitators of, and barriers to, the use of research evidence by health policymakers (67)	<p>The most commonly reported facilitators for research use were personal contact, timely relevance, and the inclusion of summaries with policy recommendations.</p> <p>The most commonly reported barriers were absence of personal contact, lack of timeliness or relevance of research, mutual mistrust, and power and budget struggles.</p>	2000	No rating tool available for this type of document	3/24	0/24	0/24

*Building Momentum in Using the Avoidable Mortality Indicator in Canada*

Subelement	Focus of systematic review	Key findings	Year of last search	AMSTAR (quality) rating	Proportion of studies that were conducted in Canada	Proportion of studies that deal explicitly with one of the prioritized groups	Proportion of studies that focused on avoidable mortality
	Review and synthesis of the evidence base for knowledge transfer and exchange (77)	The review found inadequate evidence base for doing “evidence-based” KTE for health policy decision-making.	2005	No rating tool available for this type of document	8/18 (implementation studies)	0/18	0/18

**Appendix 3: Systematic reviews relevant to Element 3 - Incentivize actions that prioritize investments in prevention versus treatment, addressing particular conditions or addressing particular inequities**

Subelement	Focus of systematic review/cost-effectiveness study	Key findings	Year of last search	AMSTAR (quality) rating	Proportion of studies that were conducted in Canada	Proportion of studies that deal explicitly with one of the prioritized groups	Proportion of studies that focused on avoidable mortality
Re-orienting existing performance management systems to focus, at least in part, on the avoidable mortality indicator and the prevention versus treatment imbalances (and related intersectoral action), conditions and inequities that these indicators bring to light	Examining performance measurement and improvement frameworks within and across sectors (i.e., health, education and social services systems) (78)	This review searched for performance measurement and improvement frameworks within and across the health, education and social service systems. The intended outcome was the creation of a foundation of evidence to inform the development of cross-sectoral quality improvement frameworks. Out of 111 identified frameworks, most (n = 97) were developed in or for the health sector. A concept sorting exercise identified 16 quality concepts applicable across many settings, sectors and levels of application.	2007	6/9 (AMSTAR rating from Program in Policy Decision-making)	Not reported in detail	0/111	0/111
Re-orienting existing impact evaluations (including sectors where health is an explicit objective and sectors where health is a potential consequence but not an objective) to focus, at least in part, on the avoidable mortality indicator and the prevention versus treatment imbalances (and related intersectoral action), conditions and inequities that this indicator brings to light	No reviews identified						

*Building Momentum in Using the Avoidable Mortality Indicator in Canada*

Subelement	Focus of systematic review/cost-effectiveness study	Key findings	Year of last search	AMSTAR (quality) rating	Proportion of studies that were conducted in Canada	Proportion of studies that deal explicitly with one of the prioritized groups	Proportion of studies that focused on avoidable mortality
Publicly reporting on actions that prioritize investments in prevention versus treatment (and related intersectoral action), addressing particular conditions or addressing particular inequities	Examining the effectiveness of the public release of performance data in changing the behaviour of healthcare consumers, professionals or organizations (84)	The small amount of evidence available provides no consistent evidence that the public release of performance data changes consumer behaviour or improves care. Evidence that the public release of performance data may have an impact on the behaviour of healthcare organizations or professionals is lacking.	2011	8/9 (AMSTAR rating from Program in Policy Decision-making)	1/4	1/4	0/4
	Examining the effectiveness of public reporting of healthcare quality information as a quality improvement strategy (80)	Public reporting is more likely to be associated with changes in healthcare provider behaviours than with selection of health services providers by patients or patient families. Over time, quality measures that are publicly reported improve. Although the potential for harms is frequently cited by critics of public reporting, the amount of research on harms is minimal, and most studies do not confirm the potential harm. Indeed, the review showed inconsistent findings about harms or unintended negative effects related to publicly reporting healthcare quality information (e.g., the selection of patients at low risk of negative outcomes or expected to do well, or other actions by providers to change ratings by manipulating their patient populations). However, some studies in long-term care revealed that public reporting can create incentives leading to unintended negative behaviours by providers.	2011	10/11 (AMSTAR rating from McMaster Health Forum)	7/198	4/198	0/198

McMaster Health Forum

Subelement	Focus of systematic review/cost-effectiveness study	Key findings	Year of last search	AMSTAR (quality) rating	Proportion of studies that were conducted in Canada	Proportion of studies that deal explicitly with one of the prioritized groups	Proportion of studies that focused on avoidable mortality
	Examining the effectiveness of publishing patient care performance data in improving quality of care (81)	Evidence is limited, particularly about individual providers and practices. Rigorous evaluation of many major public-reporting systems is lacking. Evidence suggests that publicly releasing performance data stimulates activity to improve quality at the hospital level. The effect of public reporting on safety, health outcomes and patient-centredness remains uncertain.	2006	5/11 (AMSTAR rating from McMaster Health Forum)	0/45	0/45	0/45
	Exploring how consumers use publicly reported quality of care information (83)	Fourteen included studies examined quality information, usually ‘Consumer Assessment of Healthcare Providers and Systems’, with respect to its impact on the consumer’s choice of health plans. Easily readable presentation formats and explanatory messages improve knowledge about and attitude towards the use of quality information; however, the weight given to quality information depends on other features. These features include free provider choice and costs. In real-world settings, viewing quality information is a strong determinant for choosing higher quality-rated health plans.	2008	4/9 (AMSTAR rating from Program in Policy Decision-making)	0/14	4/14	0/14
	Examining the effects of pay-for-performance and public reporting on racial disparities in healthcare (85)	In this review, only one empirical study provided data on how pay-for-performance and public reporting programs may have a neutral, narrowing or widening effect on racial disparities in	2006	4/9 (AMSTAR rating from Program in Policy Decision-	0/1	1/1	0/1

*Building Momentum in Using the Avoidable Mortality Indicator in Canada*

Subelement	Focus of systematic review/cost-effectiveness study	Key findings	Year of last search	AMSTAR (quality) rating	Proportion of studies that were conducted in Canada	Proportion of studies that deal explicitly with one of the prioritized groups	Proportion of studies that focused on avoidable mortality
		healthcare. A major public reporting program increased disparities in coronary artery bypass graft rates. Interviews with leaders of 15 major performance incentive programs in the United States indicated that current programs are not designed to reduce disparities and often lack characteristics that may be important in reducing disparities.		making)			
	Examining the effectiveness of public reporting practices on the quality of healthcare (86)	Results suggest that if a public reporting program is to be effective, it must address several key components, such as objectives, audience, content, products, distribution and impacts (intended and unintended).	Not reported	2/9 (AMSTAR rating from Program in Policy Decision-making)	Not reported in detail	0	0
	Exploring the evidence about the public release of performance data (82)	Seven U.S. reporting systems about the performance of hospitals, health professionals and healthcare organizations have been the subject of published empirical evaluations. Observational and descriptive methods predominate. Consumers rarely search out the information and do not understand or trust it. It also has a small, though increasing, impact on their decision-making. Physicians are skeptical about such data and only a small fraction makes use of it, whereas hospitals appear to be most responsive to the data. In a limited number of studies, the publication of performance data has been associated with an improvement in health outcomes.	1999	3/9 (AMSTAR rating from Program in Policy Decision-making)	0/7	0/7	0/7