



*Centre for the
Study of Living Standards
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Improving Measures of Health Care Output and Outcomes in Canada Conference Summary

Presented by the Centre for the Study of Living Standards (CSLS) and the Canadian
Medical Association (CMA)

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Improving Measures of Health Care Output and Outcomes in Canada Conference Summary

Executive Summary

The conference, organized by the Centre for the Study of Living Standards (CSLS) and the Canadian Medical Association (CMA), was held in Ottawa on October 30th 2007. Its main purpose was to discuss current methodologies and new approaches to the measurement of health output and health outcomes with the goal of understanding which measures will allow for effective management of sustainable health care in Canada.

Governments in Canada spend over \$100 billion a year (and growing) on health care, yet we do not know how effective this investment is. As Jeanne Besner, Interim Chair of the Health Council of Canada stated bluntly in the Council's latest annual report,

“ We don't have sufficient evidence to evaluate the strength and sustainability of health care renewal on a system-wide basis.”

There are questions of quality, effectiveness and accountability that must be made more clear. The 65,000 members of the CMA know that a sustainable health care system depends on making the relationship between health interventions and health outcomes crystal clear. Consequently, the CMA and the CSLS – an internationally recognized think-tank known for analyzing the determinants of productivity and social well-being through research - co-hosted this invitational conference. The CMA has a history of linking health care inputs with outcomes as well as their impact on the economy. The CMA first worked with the CSLS in March 2006, co-hosting a roundtable on the links between health care in the economy. The roundtable attracted national and international experts on health and economy. The culmination of that meeting resulted in the participants calling on the government to improve the collection of health care outcomes - one of the goals of this conference.

The conference audience included academics, policy-makers as well as senior federal and provincial government officials who are responsible for the improved collection and measurement of health care outputs and outcomes, and ultimately performance. By improving measures of health care output and outcomes we aim on improving resource allocations to help ensure a sustainable world class health care system across Canada. The motivations for holding this conference include:

- With aging of the Canadian population it is expected that the share of GDP devoted to health care will continue to rise.
- Given budget constraints, it is important that the resources devoted to health care be used in the most effective manner possible.
- To monitor effectiveness, we must be able to accurately measure health care output and outcomes.

- To mobilize players in the health sector to obtain better measures of health care output and outcomes.
- To create health measures in the System of National Accounts that are suitable for international comparisons. This is particularly relevant since members of the European Union have already addressed this issue and it is time for Canada to follow their lead.

Following presentations and discussions by various academics, health experts, and policy-makers, directions for the improvement of measures of health outputs and health outcomes are the following:

- More resources should be allocated to gathering data regarding expenditure levels by disease in Canada.
- There is no contradiction between information at the micro level and the macro level. Micro level data includes information on costs, treatments and outcomes at the disease level. Macro level data includes aggregate output of the health care sector and outcomes of health interventions. Micro level data can and should be integrated to create aggregate data since many policy decisions are based on aggregate indicators from the National Accounts.
- The creation of a health satellite account should be a priority for Canadian statistical agencies. Work currently being done in the United States should be closely monitored and followed by Canada. This includes quality-adjusting price indices of health care sector output to reflect true price increases.

Improving Measures of Health Care Output and Outcomes in Canada Conference Summary

Introduction

The conference, organized by the Centre for the Study of Living Standards (CSLS) and the Canadian Medical Association (CMA), was held in Ottawa on October 30th 2007. The CMA first worked with the CSLS in March 2006 at a roundtable discussion which resulted in the participants calling on the government to improve the collection of health care output and outcomes. The purpose of the conference was to discuss current methodologies and new approaches to the measurement of health output and health outcomes. Health care expenditure in Canada is currently greater than \$100 billion a year, yet we do not gather accurate information to monitor and improve the effectiveness of the Canadian health care system.

This topic is not only relevant to Canadians because of the aging Canadian population, which will put a strain on health care resources, but also because international discussions and research on this topic have progressed while Canada has stood idle. These international discussions have resulted in the implementation of new measurement methodologies in the national accounts of other countries, yet Canada has failed to devote resources to this topic. For example, in 2001, Eurostat, the official statistical office of the European Commission, published a handbook on price and volume measurement in the national accounting framework which provided detail on recommended methodologies for measuring output and prices of the health care sector. In 2005 in the United Kingdom, the National Institute for Economic and Social Research (NIESR), in cooperation with The Atkinson Review, completed a comprehensive review of new approaches to measuring health care output and productivity. Finally, the National Academy of Sciences, based in the United States, will be publishing a book on measurement of health care output which will feature contributions by David Cutler and Jack Triplett, both of whom participated in this conference. As other countries improve the measurement of output of the health care sector in their national account figures, the international comparability of Canadian health care sector output data will become less reliable.

The conference audience included academics, policy-makers, and senior federal and provincial officials who are responsible for the improved collection and measurement of health care outputs and outcomes, and ultimately performance. The conference was broken down into four sessions, where the presentations in each session revolved around a similar theme.¹ The first session provided an outline of current measurement methodologies used in Canada and the United States, and the challenges associated with the measurement of health care output and outcomes. The second session provided insight into new approaches to measurement and described work that is currently underway in both Canada and the United States. David Cutler provided a luncheon address via videoconference outlining his research on the value of measuring health

¹ The conference presentations are available on the CSLS website <http://www.csls.ca/events/healthcare.asp>

outcomes. The third session focused on the various types of measures health care experts believe are most needed, as well as outlining the reasons why measurement of health care output and outcomes are crucial to the effective management of the Canadian health care system. The final session summarized the key issues of the conference and suggested methods by which the visions outlined in the conference could be translated into reality.

Opening Speaker: Senator Wilbert Keon MD

“What Big Picture Issues in Health Care Are Starved for Information?”

Senator Keon first acknowledged the contributions of many Canadian organizations in gathering and storing useful health information (for example, the Canadian Institute for Health Information (CIHI), Statistics Canada, and the Canadian Institutes for Health Research (CIHR)). For example, Canada collects a large amount of information on wait times which has been useful for monitoring the health care system. However, he pointed out that there is currently a shortage of researchers and investment in health sciences research. The importance of information, he argued, is that it will allow policy-makers in the health care sector to make objective decisions. Canada currently spends approximately one billion dollars on health sciences research (approximately \$30 per capita) while the United States is spending approximately \$97 per capita on health sciences research; he posed the question, should we be competing with the United States in terms of the level of spending on research? In terms of a vision for health sciences information, he advocates a national knowledge network. Although he did note that there are limitations to what can be done with information regarding disease management, the key goal should be information that enables disease prevention.

An area of particular interest for Senator Keon is population health. He argued that health care planning should be based on information regarding population health. There are significant disparities in the level of health across Canada. Notably, there are differences in health levels between the rich and the poor, between the urban and rural populations, and between aboriginals and non-aboriginals. Constant evaluation of population health, he argued, will allow for effective management of the health care system. For example, detailed patient surveys in Ontario have helped to reduce volumes of certain health activities while health outcomes have improved. This constant evaluation and collection of information can be used to improve the effectiveness of the Canadian health care system.

Session I: Current Methodologies and Estimates of Output and Outcomes in Health Care

(i) Andrew Sharpe, Executive Director, Centre for the Study of Living Standards
 “The Measurement of Output and Productivity in the Health Care Sector in Canada: An Overview”

Andrew Sharpe first emphasized that the trends in the Canadian health data may not be meaningful as there are many challenges associated with measuring output and productivity in the health care sector. First, the Canadian health care sector is, for the

most part, non-marketed, therefore prices and values of nominal outputs independent of inputs cannot be directly observed. Second, there is a lack of consensus on what the output of the health sector entails. Third, medical advances have improved the quality of health care yet the current price indices fail to capture these improvements and therefore may be overestimates. Finally, there is a wide range of factors that affect health in addition to health interventions, such as lifestyle choices and environment that could potentially result in no direct relationship between health outputs and productivity, and health outcomes.

Sharpe provided an overview of official Statistics Canada estimates of health care output and employment (based on the NAICS definition). According to Statistics Canada, the health care sector (including social assistance) has experienced negative productivity growth over the 1987-2006 period. Additionally, prices in the health care sector have been growing faster, on average, than prices in the rest of the economy. Whether this is a pure price effect or the result of quality improvements is of great importance. He emphasized that the key issue of the conference is to determine if resources should be allocated to initiatives that approach health output from an industry-based national accounts perspective. This type of approach would attempt to develop monetary estimates of the value of the health care sector that adjust output for quality changes.

(ii) Michael Wolfson, Assistant Chief Statistician, Statistics Canada
 “Improving Measures of Outputs and Outcomes in Health Care”

Michael Wolfson began by identifying the reasons for collecting data on health outputs and health outcomes: to determine whether health care dollars are being spent efficiently; to identify possible changes in the way health care dollars are allocated that could improve the health status of Canadians; and to determine what types of institutional structures are likely to lead to cost-effective use of health care dollars.

Using empirical evidence from a study comparing the effects of heart attack treatments in Ontario and New York he showed that it is not the case that increased outputs (treatments) will necessarily result in higher health outcomes. He posed the question: should outputs (or volume of activities) be a measure of progress if they have no effect on health? Another study shows that significant increased treatment of heart attacks in Canada over a ten year period, 1995-2004, resulted in only modest improvements in survival rates. Moreover, across regions in Canada, there is significant variation in the effect of treatment on outcomes. While there are caveats surrounding these results, the fact remains that there are large unexplained cost variations in treatments and outcomes across Canadian regions. Given these unexplained variations, he poses the question: what is the value of a System of National Accounts (SNA) for health care?

Wolfson concluded that what we should measure, what is most useful in order to manage the health care system for effectiveness, is the change in health status attributable to health interventions, such as longitudinal data on patient directories. He argued that

there is no use in counting a larger number of treatments if they have no effect on health outcomes. Additionally, data on unit costs for health services need to be more readily available. One single indicator, such as GDP, will not suffice as an indicator of progress in the health sector. Indicators such as life expectancy, quality-adjusted life expectancy, costs of treatment, and equity of treatment and health status would all be useful tools to measure the effectiveness of the health sector. Data encompassing both providers and patients that are both longitudinal and multivariate should be the goal of health care data collection. The priority in collection of health information, he argued, should be on retrieving data that are fundamental to the system. The development of estimates of health output that are consistent with the SNA should be placed on the bottom of the list of priorities.

(iii) Ana Aizcorbe, Economist, US Bureau of Economic Analysis
 “Toward a Satellite Account for Health”

Ana Aizcorbe outlined the work that is currently being done by the Bureau of Economic Analysis (BEA) in the United States to develop better measures of health output. With health care expenditures doubling in the past 25 years, the BEA is seeking to determine whether the dollars spent on health care are worth it. Their analysis takes both a cost-effectiveness approach, how do the dollars translate into improvements in health, and a cost benefit approach, weighing the costs of treatments with the benefits of health outcomes. However, the data requirements for this type of analysis are currently not being produced in the United States. Nominal expenditure that is broken down by disease categories is not available. Further, this type of data is complicated by the issue of co-morbidities. That is, where do you attribute health expenditure when there is more than one condition or symptom being treated? A second piece of datum that is missing is time series estimates of the prices of treatments that control for quality improvements. Aizcorbe noted that the BEA satellite account focuses only on the costs of health care output and not on health outcomes.

The goal of the BEA research is to reconcile the accounting differences for expenditure estimates across organizations in the United States, provide data on nominal expenditure by disease to determine the cost of treating a disease, and improve price deflators. It has been estimated that over half of the increased expenditure in health care in the past 25 years is due to higher prices. However, there are numerous methods to measuring prices which all give varying estimates. Further, price index estimates of treatments are complicated by substitutions across treatments. For example, the treatment of depression has moved away from expensive talk therapy towards cheaper drug therapies, yet current statistics will not capture this substitution. They suggest the use of price indices on a disease basis as they will capture cost variations arising from treatment substitution. However, this type of index has not yet been constructed in a way that accounts for quality improvements, and there is a lack of consensus on how to address this issue.

Aizcorbe noted that a considerable portion of the BEA’s effort has been in defending their work and confirming that the deficiencies of the current statistics are

significant enough that the BEA should devote resources to improving the estimates. Empirical evidence shows that current health prices are overestimated, and therefore both output and productivity are underestimated. Moreover, they do not believe that adjusting current GDP estimates will be an acceptable solution. The BEA does not advocate changing how health care sector output and expenditure are currently measured in the United States' national accounts. However, they do propose a supplemental satellite health account to provide additional information for cost by disease.

Discussion

- Conference participants wondered whether current productivity estimates for the health care sector are meaningful according to the NAICS definition that is used by Statistics Canada to produce official data. Additionally, participants agreed that the data currently made publicly available by Statistics Canada does not provide enough detail regarding output of the health care sector. For example, output data are not broken down at the 3-digit NAICS level.
- A number of participants expressed the view that the concepts of health outputs and health outcomes are not mutually exclusive and one measure should not necessarily be given priority over the other.
- Michael Wolfson argued that the danger of using SNA data for the health care sector is that there are no explicit micro-foundations for the data and the numbers can therefore not be disentangled. This results, he argued, in the data being irrelevant to decisions regarding cost-effectiveness of the health care system. However, a number of conference participants noted that policy-makers often base their decisions on SNA estimates. It is therefore not appropriate, they argued, to abandon the SNA framework completely, particularly since health care expenditure accounts for over 10 per cent of GDP in Canada.
- Conference participants agreed that the work currently being done by the BEA in the United States should be closely monitored by Canada as a possible direction for improving measures of health care output.

Session II: New Approaches to the Measurement of Health Output and Outcomes

(i) Frank Lichtenberg, Courtney C. Brown Professor of Business, Columbia University

“Biomedical Innovation, Longevity, and Quality of Life”

Frank Lichtenberg first presented evidence of health outcomes worldwide: life expectancy and functional health status are improving, there is convergence in longevity between poor and rich countries, and indicators of quality of life are showing improvements. He argued that the role of biomedical innovation, in this case new drugs, have had positive effects on health outcomes and these effects can be estimated. While it is the case that new drugs cost more, Lichtenberg argued that they result in longer life, improved quality of life, increased ability to work, and reduced need for other medical

interventions. Empirical evidence shows that from 1995 to 2000, the five year survival rate of HIV/AIDS increased from 3 per cent to 54 per cent. Much of this improvement can be attributed to new versions of drugs released on the market. Lichtenberg showed that there is a clear contemporaneous correlation between the drug utilization rate and the percentage change in the mortality rate for HIV/AIDS patients.

This effect exists beyond the scope of HIV/AIDS as new drugs have resulted in reduced hospitalization of patients as well as extension of longevity for a variety of conditions. Controlling for other factors that effect health, such as income and education, the launch of New Chemical Entities (NCE) has resulted in a strong positive impact on the probability of survival, while the introduction of generic drugs has had no effect on the probability of survival. Given data on the costs of drugs it is possible to determine the cost per life year gained. Current estimates of the cost per life year gained in OECD countries are much lower than average estimates of the value of a life year. He concludes that the launch of new drugs is, on average, cost-effective.

(ii) Robert Evans, Professor of Economics, University of British Columbia

Robert Evans first pointed out that the debate on whether monetary values should be placed on health output, and if so, how should this be done, has been ongoing for over 40 years. He argues, however, that there is no direct relationship between health status and expenditure on health care. For example, the population in the United Kingdom is healthier than in the United States, but the United States has a higher level of health expenditure. He argued that it is effectiveness of the health care system that should be monitored, and not levels of activities since there are large variations in the data concerning the relationship between expenditures and outcomes. Additionally, he argued that the lack of a single payer system in the United States likely accounts for their high level of health expenditures.

Citing the same evidence as Michael Wolfson, he characterized the variations in health expenditures across regions in Canada. For the most part, regions provided the same amount of major and minor procedures, while the number of diagnostic and imaging processes performed varied widely across regions. Additionally, the evidence shows that higher expenditures or more specialists do not necessarily lead to a higher level of health status or quality of health care. Evans' final observation was that budget cuts in the early 1990s forced hospitals to use resources more efficiently, as hospital utilization rates rose with the funding cuts.

Evans concluded that we should be measuring effectiveness of treatments on health because that is what is valued by the patient, rather than the level of activity in the health care sector. This conclusion is motivated by the fact that health care is not a normal good, that is people do not wish to consume more health care if they have the choice. Moreover, there are certain health outputs, he referenced "recreational cardiac surgeries", that have no effect on health outcomes yet they are counted as outputs of the sector.

Discussion

- Conference participants argued that we cannot assume direct causality between budget cuts and increased hospital efficiency. It was noted that improved technology which allowed increased numbers of day surgeries in the 1990s may have been the cause of higher hospital utilization rates.
- Regarding the studies which show that there is no relationship between treatments and health outcomes, Frank Lichtenberg pointed out that it is important not to ‘cherry pick’ from the studies as there have been numerous studies on the topic with various results. There was, however, an agreement that the variations in the effect of treatments on outcomes do warrant further investigation.

Luncheon Address

David M. Cutler, Otto Eckstein Professor of Applied Economics and Dean for the Social Sciences, Harvard University (via videoconference)

“The Value of Knowing: National Health Accounts”

David Cutler first outlined the goals of his research, which are similar to the goals of the BEA, namely, has increased medical expenditure in the United States been worth it, and where can medical research dollars be spent most productively. These goals can only be reached once information on what is occurring in the health care sector and the value of these activities are available.

There are three types of information required to build a health account: medical spending (input), population health (output), and disease models which link medical spending to population health. There are challenges associated with gathering each type of data set. For example, in terms of medical spending, there are problems associated with attribution due to co-morbidities. He suggests a ‘person-based’ method where the spending per person is associated with a group of treatments, symptoms, conditions and behaviours. From this information it is then possible to disaggregate spending and attribute it to each factor that resulted in medical spending.

In terms of population health, there are challenges in accurately collecting data on mortality. Mortality data are often unreliable due to errors in diagnosis coding. Additionally, other factors that contribute to death, such as obesity or lifestyle choices, are not accounted for in the data. He suggests that mortality be measured and modeled in the same way as spending, where the probability of death is associated with a group of conditions. This model can then be used to ‘back out’ the true cause of death, and will likely give different results than when only looking at the causes of death that are recorded by medical professionals. Cutler’s measure of population health also accounts for quality of life, measured in quality adjusted life years (QALYs). Quality of life has increased over the 1987-2004 period for the average American, yet decreased from 2001-2004. The overall increased trend in quality of life is attributed to less impairments

involving primary activity and walking. Cutler hypothesized that the fall in quality of life since 2001 is due to increased obesity.

The final type of information required to build a health account is the link between medical spending and population health. This information, he proposes, should be gathered at the disease/condition level and a catalogue of disease/condition models can then be collected. For example, there have been significant improvements in health outcomes following Coronary Heart Disease (CHD) and these improvements can largely be attributed to medical care spending. However, other conditions such as strokes have also seen declines in the level of mortality, yet it remains unclear what role medical care spending has played in this health outcome improvement. Cutler concluded with two hypotheses: (i) his research will show that technological advances in medical care have been cost effective, and (ii) recent obesity trends have been counter-productive with regards to medical care technological advances.

Discussion

- Cutler agreed that in addition to population health, the additional income that a healthier person can generate due to medical interventions must be counted on the output side of the health account.
- Cutler also described the type of dataset that would be most valuable to his research. This entails multivariate, longitudinal data which includes three types of information: surveys to identify risk factors (for example, smoking and obesity), records to identify costs of treatments, and biological information concerning chronic diseases and outcomes over time.
- Cutler identified some challenges of his framework for developing a health account including the existence of co-morbidities, and variations in care. In regards to co-morbidities, he stated that in addition to estimating the impact of medical interventions on the long term mortality of a single disease, we must consider how that will impact the risk of death due to other factors or diseases. In regards to variations in care across regions, Cutler agreed that eventually we should try to understand these variations. However, he argued that the mean results of medical interventions, the health outcomes ‘on a whole’, should be made a priority.

Session III: Visions for Better Measures of Health Output and Outcomes

(i) William G. Tholl, Secretary General and Chief Executive Officer, CMA

William Tholl outlined his vision for better measures of health output and outcomes. He first acknowledged that Canada currently has existing structures and institutions to address the issue of creating better measures of health outputs and outcomes. These include Statistics Canada’s Canadian Community Health Survey, the Canadian Patient Institute, and the Canadian Institute for Health Information (CIHI). He argued that these types of structures and institutions are needed in Canada since

international indicators on population health show that Canada's rank has been falling in recent years. For example, among OECD countries, Canada now ranks 22nd in terms of infant mortality rates and we were previously ranked 6th. He argued that while other countries have improved their health outcomes Canada has lagged behind. Improved data on health outputs and outcomes will allow Canada to do better relative to other OECD countries. Most importantly, he noted that we should not let good be the enemy of the great. There should be a focus on improving current measurement of health outputs and health outcomes even if the best possible measures are unattainable.

He concluded that as better data on health care outputs and outcomes become available, we must ensure that a vacuum of leadership does not exist and we keep the momentum going. Tholl pointed out that there is currently no single body at the national level in charge of directing research for better practices in the collection of health care data. This challenge is exacerbated by the fact that health care falls under provincial jurisdiction in Canada. This jurisdictional issue implies that there is effectively no incentive for improvements in health care data collection at the national level. He called for a commitment to national purpose, action and analysis to ensure that health information is used to benefit Canadians.

(ii) Glenda Yeates, President and CEO, Canadian Institute for Health Information
 “Inputs, Outputs and Outcomes: What Measures, What Matters”

Glenda Yeates identified the type of information CIHI currently collects, what gaps exist in their data and her vision for improving measurement of outputs and outcomes. CIHI currently holds a large data set on inputs to acute health care and activities of physicians and nurses, but there are gaps in their data regarding inputs to home health care and other types of health professionals outside of physicians and nurses. Similarly, information on activities and outputs are easily available for acute health care and hospital utilization but there is information missing regarding community-based care, as well as gaps in information reported by some provinces and territories.

Outcome data collected by CIHI are based on the CIHI/Statistics Canada health outcomes framework which identifies how the health care system interacts with patient characteristics to produce health outcomes. Outcome data collected by CIHI includes: data at the regional level, re-admission rates for specific medical conditions, and short and long term survival rates for certain conditions. Information regarding pre and post-treatment health status was collected in the past, but is no longer a part of CIHI's information bank. The main challenge associated with measuring outcomes is that there is no consensus on what the important measures are, and how success should be determined in the health care sector. Her vision entails greater dialogue and consensus regarding the appropriate measures of health outcomes. Better quality data that spans the country and enables system-level planning is needed, since ultimately, if you don't count it, it won't count. She noted that in addition to collecting health care data, we should ensure that the data are used to better the functioning of the health care system.

(iii) Ian Bowmer MD, Vice-Chair, Health Council of Canada

“Why Focus on Health Outcomes?”

Ian Bowmer identified what types of health outcomes should be measured, namely chronic condition indicators, and how we can improve the data collection processes. Since the majority of health costs have been attributed to chronic conditions and diseases, Bowmer argued that data on chronic conditions such as obesity and diabetes are key indicators of health outcomes. Additionally, Canada already collects vast amounts of information on these two conditions regarding prevalence, disparities within the Canadian population and common treatment regimes.

The data suggests that high quality care, measured as the number of recommended tests received, results in lower costs of treatment. He stated that the quality of treatments can be improved if an appropriate system that can support assessment of health outcomes were to be created. This type of system, he argues, can be achieved through inter-sectoral and inter-provincial collaboration, widespread use of electronic health records, and a clear focus on a few measures of health outcomes. One of the many challenges with this type of system is that there are jurisdictional issues with the provinces and territories regarding who should contribute data and what type of information is shared across borders. The use of electronic health records could address this jurisdictional issue in addition to providing longitudinal data that would help determine what types of effects health care spending has on health outcomes. He remarked that credit card companies, such as Visa, likely have more complete and easily accessible longitudinal health records for patient treatments, such as drugs, than the current largely paper based system. Finally, as voiced by previous presenters, consensus on which health outcome indicators are the most important is needed. Bowmer advocated the use of indicators of chronic disease management as this data is likely to provide the most useful information.

(iv) Sarah Muttitt MD, Vice President Innovation and Adoption, Canada Health Infoway

“eHealth: Contributing to health care quality, accessibility and productivity”

Sarah Muttitt outlined the status quo of electronic health information, the reasons why readily available information is needed, and the challenges associated with implementing Electronic Health Records (EHR) in Canada. Health care delivery in Canada remains largely paper based which results in poor compliance with prevention, errors in diagnosis and wrong treatment decisions being made. Currently, only 23 per cent of primary care doctors use HER to keep track of patients, this is among the lowest of all OECD countries. Health care is shifting towards increased home and social care, areas where Glenda Yeates indicated that data are lacking, and EHR could improve health information management in this area, among others. Currently between 1.5 and 2.0 per cent of Canadian health care expenditures are on health care IT. This is low compared to 3.4 per cent for health care providers in the United States, and 4.0 per cent of health care expenditures in the United Kingdom.

The implementation of EHR in every province and territory would increase access to health care through reduced wait times, increase quality of care through decreased errors in diagnosis, and ultimately an increase in productivity through, for example, reduced duplications and call-backs to physician's offices. It is important that once EHR are implemented, that indicators of the benefits of this type of system should be monitored to ensure continued progress. The ultimate goal of EHRs is to allow relevant, reliable and effective data to determine the impact of health care on health outcomes for both health care providers and researchers.

Discussion

- The panel stressed that an important objective of gathering health information on this large of a scale is to make relevant information available to the Canadian public. Additionally, health information would allow for transparency and accountability in the health care system.
- The panel also stressed the importance of information being digitized and standardized across provinces and territories. Most importantly, if information remains on paper in physicians' offices then it will not be useful and the Canadian health care system will not progress beyond the status quo level of efficiency.
- Conference participants indicated that more focus should be put on areas outside the health care sector that affect health outcomes, such as early childhood development programs. The panel noted that often these areas are outside the jurisdiction of provinces and territories and, therefore, there is a need for leadership at the national level to manage these multiple factors affecting health outcomes.
- The panel stressed Canada's poor relative performance in collecting and measuring data on health outcomes. They noted that Canada had once been a leader in terms of developing measures and collecting data on health outcomes such as potential years of life lost and quality adjusted life years, but now Canada is lagging behind.

Session IV: Translating Visions for Better Measures of Health Output and Outcomes into Reality

(i) Jack Triplett, Non-resident Senior Fellow, Brookings Institute

Jack Triplett provided a summary of the importance of reliable data for health care policy as well as how to proceed with the creation of health accounts. First, Triplett argued that the debate regarding the importance of outputs versus outcomes is a non-debate. Information on both health outputs and health outcomes can, and should, be used to create a national health account. The issue that the conference participants should be concerned with, he argued, is that data on costs by disease are no longer collected in Canada. This is the type of data that will be useful to move forward with the creation of health accounts, both at the micro level advocated by Michael Wolfson, and the macro level similar to the work being done by the BEA.

Second, Triplett noted that current price indices indicate high inflation in the health care sector. However, when Triplett corrected price indices for health outcomes he found that there was little inflation and the volume of services, as well as productivity, showed positive growth. The implications of this result are key for policy-makers in the health care sector. For example, recent policies to cut health care budgets in the United States were implemented to address inflation. However, these policies were based on data that had not been corrected for quality improvements by way of health outcomes, and therefore showed more inflation than had actually occurred.

Third, Triplett identified the importance of gathering data at the micro level. Micro/disease level data is crucial in estimating inflation, changes in volume of services, quality improvements, and the link between health care expenditures and outcomes. He argued that micro level data should be integrated to create aggregate data since many policy decisions are based on aggregate indicators from the National Accounts. In order to move forward in the creation of national health accounts there needs to be a coherent message from all the players in health care policy regarding the types of data that are needed and what this data will ultimately be used for. Currently, Canadians know what we spend on health care, but there is no clear answer concerning what it is that Canadians are receiving in return.

(ii) David Zussman, Jarislowsky Chair of Public Sector Management, University of Ottawa

David Zussman provided an overview of the way in which reliable measures can be used to manage the health care system. He stated that health care measurement provides feedback to the delivery system, is a tool used to evaluate efficacy and efficiency, and helps to hold organizations and people accountability. He noted that quantitative data that are most relevant for measuring cost-effectiveness of health are often dropped for other measures which are easy to collect but less relevant. Canadian health information should strengthen conceptual models that link inputs, activities, outputs and outcomes, and there should be consistency in the measures of outcomes. Zussman emphasized that other countries, such as the United Kingdom, the United States and Australia have paved a path for Canada to follow.

Ideal management of health information in Canada should focus on relevant micro level data on outcomes in addition to aggregate quantitative measures of inputs and activities, yet limit the number of measures to ensure focused analysis. As a public sector industry, the importance of building a chain of accountability in terms of outcomes is paramount. The health care sector should encourage experimentation as well as increased levels of consultation across organizations in terms of measurement. Ultimately, health information should be used to create a strong performance culture that can identify the effects of policies on outputs and outcomes.

(iii) William Robson, President and CEO, CD Howe Institute

William Robson provided a summary of the purposes of health care measurement. First, as stated by Triplett, he emphasized the importance of developing reliable estimates of health care output within the national accounts framework. Robson pointed out that there is a practical value to macroeconomic indicators for policy-makers. For example, central banks rely on these indicators, and accounting for over 10 per cent of GDP, health care is an important determinant of these indicators. More specifically, levels of inflation affect many other sectors of the economy and accurate inflation measures are essential. Second, as stated by Zussman, there is a chain of accountability in the health care sector that can be effectively managed through collection of information. Third, improved measures of health outputs and outcomes will also empower the Canadian public, consumers of health care, to make appropriate and better informed choices regarding the health care services they seek.

Conclusion

The objective of this conference was to review current approaches to the measurement of health output and outcomes, and to identify ways in which better measures of health output and outcomes can be developed in Canada. Following presentations and discussions by academics, health-experts and policy-makers, directions for the improvement of health output and outcome measures in Canada include the following:

- More resources should be allocated to gathering data regarding expenditure levels by disease in Canada.
- There is no contradiction between information at the micro level and the macro level. Micro level data includes information on costs, treatments and outcomes at the disease level. Macro level data includes aggregate output of the health care sector and outcomes of health interventions. Micro level data can and should be integrated to create aggregate data since many policy decisions are based on aggregate indicators from the National Accounts.
- The creation of a health satellite account should be a priority for Canadian statistical agencies. Work currently being done in the United States, the United Kingdom and the European Union should be closely monitored and followed by Canada. This includes quality-adjusting price indices of health care sector output to reflect true price increases.