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MEDICAL WORKFORCE PRODUCTIVITY IN CANADA: Drivers, Measures and Promising Practices

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INTRODUCTION

Improving the productivity of the health workforce has become of increasing interest and policy concern in Canada. While health care makes up over 10 percent of the Canadian economy and employs over 1 million workers, very little is known about productivity in health care (CPRN 2009, HCC 2005). Industries outside of the healthcare domain have long recognized the importance of measuring and enhancing productivity of its workforce (Proctor 2004). Given that human resources constitutes between 65% and 80% of the total operating budget in a typical healthcare organization, making HHR productivity a critical factor in an overall assessment of the efficiency and effectiveness of the healthcare system (Dussault & Dubois 2003; Evans *et al* 2010).

“Productivity measures are a useful summary statistic for policy-makers in the health care sector. Estimates of productivity can identify ways in which resources can be allocated more efficiently as well as enable monitoring of activities in the health care sector.” (CSLS 2007, p. 25)

“The modern health care sector makes up roughly one-tenth of the economic activity of modern economies, and labour inputs make up a relatively large share of its costs, relative to other industries. It is thus understandable that the measurement, tracking and improvement of labour productivity ... should be of policy concern.” (Evans, et al., 2010, p. 1)

Interest in health human resource productivity includes, but is not limited to, concerns regarding medical workforce productivity, the second largest group of health professionals in Canada. One source of these concerns is the revelation that physician productivity has been on the decline since the early 1990s. Physicians on average are working fewer hours, providing less direct and less comprehensive care (Chan 2002, Crossley *et al* 2009, Dauphinee and Buske 2006, Evans *et al* 2010). Such trends wreak havoc with human resource planning activities that have tended to use simple physician to population ratios – now seen as woefully inadequate to capture the need and demand for physician services across the country (CMA 2007). Diminishing productivity measures also exacerbate worry about the sustainability of the health

system of which the bulk of costs are attributable to health human resources (CPRN, 2009).

In this background document, we highlight some of the key issues that are raised in the most recent medical workforce productivity debate in Canada. We begin by unpacking what is meant by productivity, how it is defined, measured and the key drivers for the recent policy focus on productivity. After highlighting what some of the productivity problems are, we then examine some case studies that offer some promising directions for improving productivity at the organizational or practice level. These include collaborative models of practice within the medical profession and with other professions, attenuation of practice variations and technological innovations. Many of these 'innovations' may not necessarily new, but have confronted significant barriers to their uptake in the system more broadly. In the final section of the paper, we address these as well as the corresponding facilitators and promising practices. We conclude with some recommended courses of action to scale up these initiatives and to overcome the seemingly inherent inertia of health organizations.

A Note about our Methodological Approach

The methodological approach we undertook in preparing this background document entailed a structured, though non-exhaustive, scoping review of the grey and peer-reviewed literature.

- (1) The academic/peer-reviewed literature was obtained by searching databases such as: PubMed/Medline, Scholar's Portal Search, Academic Search Complete and Google Scholar as well as Google search. Key terms that were used included: physician productivity, efficiency, effectiveness, quantity, quality, measurement of productivity, drivers of research in productivity, organizational efficiency, multidisciplinary practice models, task substitution, task shifting, skill mix, collaborative interprofessional organizational arrangements, task sharing, technology, best practices, challenges, barriers, facilitators, lessons learned, payment incentives, payment structures, access, outputs, outcomes, addressing lower costs, gaps, further research.
- (2) The grey literature was obtained by using Google search with the same key terms that were used in the databases search. In addition, organizations'

websites such as the Canadian Medical Association, the Michael Smith Foundation for Health Research, the Center for Productivity and Health Human Resources, the UBC Centre for Health Services and Policy Research, the OECD, the WHO, the Centre for the Study of Living Standards, Canadian Institute for Health Information and the Health Council of Canada, among others, were consulted. By reviewing the reference lists of key reports, other key grey literature was also found.

Because we wanted to focus on the most recent productivity debate, we primarily focused on literature published in the last five years in Canada or about the Canadian situation. Where appropriate to provide some historical perspective or where directly relevant to organizational influences on physician productivity, we extended this time frame back another five years. We excluded from our analysis here any publications that dealt exclusively with productivity reforms focused on the educational sector/level and the regulatory/provincial policy level as these were to be addressed by the paper prepared by Dauphinee and colleagues in the Canadian led theme (2010). Searches were specifically targeted to physicians (other terms used included: doctors, general practitioners, medical doctors, etc.), and excluded other health professionals (i.e. nurses, nurse practitioners, etc.).

In terms of the analysis of the data we gathered, we identified at the outset some of the key issues/themes for which we targeted in our literature extraction process. These formed an initial template for this background paper. Other themes emerged from the review process and were subsequently integrated into the template where appropriate. Background a priori themes included how productivity was defined and measured in a Canadian context; emergent background themes we include in this paper include a consideration of the drivers of the recent focus on physician productivity. The focus on interprofessional care models and technological innovations as means by which to improve organizational productivity of the medical workforce were also identified at the outset as promising models/practices to explore further in this paper. Finally, although we were asked to identify some of the key barriers, facilitators and promising practices, those included in this paper emerged almost entirely from our review of the literature.

SECTION 1: CONTEXT OF PRODUCTIVITY POLICY & RESEARCH

It is critical to contextualize the policy and research environment to best understand how to improve productivity. In this section, we first address the issue of how to define and measure productivity. Using some of the standard measures of productivity, we next outline in more details some of the recent trends in medical workforce productivity in Canada. We discuss how these trends and other factors have been driving the productivity agenda and what is hoped to be accomplished. Finally we present some of the recent critiques of typical productivity measures that have dominated the HHR productivity debate in Canada.

Defining & Measuring Productivity

In order to improve productivity, it is necessary to define what we mean when we use the term and by extension, how to measure it. As we shall see, there are important consequences of how productivity has come to be defined and measured in terms of what it includes and perhaps more importantly what it leaves out.

In Canada, as elsewhere, there is a tendency to define productivity in terms of the *outputs* and *inputs* though earlier measurements which are still cited include number and types of patient encounters (Moore 2002). Evans, *et al.*, 2009, for example, describe that productivity is often “a measure of the volume of *outputs* achievable for a given volume of *inputs*.” (p. 1). Productivity improvements can be achieved through increasing outputs of health human resources. In many cases, there is a time element involved (e.g. patients seen per hour). According to a CHSRF (2007) report, productivity tends to refer to “service rendered *per unit of time* worked by the healthcare provider.” (p. 7). It goes on further to state that, productivity “does not mean that providers work more hours; rather, it means that providers generate more service per hour worked.” (p. 7). This is typically referred to as *service intensity*, which in the case of medical workforce productivity is “the rate at which a physician provides services per unit of time spent in *direct patient care*, and is essentially [in the case of physicians in fee for service] ... measured as billings per hour of direct patient care.” (Jeon & Hurley 2007, p. S19). So productivity has come to be defined as involving the intensity of outputs pertaining to direct patient care over time.

Trends in Physician Productivity in Canada

As noted at the outset, there have been rising concerns with the decline in the measures of productivity of medical human resources in Canada. Productivity, as measured (perhaps more crudely) by reported hours worked, was already showing a clear downward trend by the mid-1980s and early 1990s as illustrated by data collected through the CMA Physician Resource questionnaires (CMA 2007, Dauphinee & Buske 2006). Similar findings were revealed when using physicians' billing per hour in Ontario particularly for subgroups defined by the gender of the physician, practice location and type, and by years since graduation (Jeon & Hurley 2007). As Crossley, *et al.* (2009) stated that such reductions in hours of direct care "are driven by ... some fundamental changes or change in the economic environment that affected physician behaviour across a wide range of cohorts and ages. Moreover, because labour-supply trends for physicians appear to differ importantly from those of other professionals, it is unlikely that general changes in the labour market or taxation can be responsible." (p. 17)

Exacerbating these quantitative trends were qualitative changes in the content of physician care. Chan (2002), for example, brought to our attention the decline in the provision of comprehensive care by general practitioners and family physicians in Ontario which was evident across all age groups and for both male and female physicians. These declines in productivity did not seem to have a consequent reduction in revenues (Evans, *et al.*, 2010); in fact some argue that *less has been done for more*. All of these changes must figure into future national physician workforce projections (Kondro 2007). Increasing the number of physicians who desire to work a decreasing number of hours may not be the best decision to improve productivity (Evans, *et al.*, 2010).

Factors that Influence Physician Productivity

Physician Factors

- Specialization
- Gender/Age
- School of Graduation
- Lifestyle preferences

Patient Factors

- Gender/Age
- Case Mix

Organizational Factors

- Remuneration method
- Practice Setting
- Model of Care Delivery

(distilled from Danielson 2006, Jeon & Hurley, 2007, Moore, 2002)

General Critiques of Productivity Measures

Medical workforce productivity is a multifaceted concept so it is difficult to come up with a measure that captures all of these elements. As Evans *et al.* (2010) have noted, “there are significant technical and conceptual problems in the measurement of productivity in general, and these are compounded by the special characteristics of health care.” (p. 5). Some have called into question how such measures “may seriously underestimate the true contribution of the health care sector to real output, and more importantly to the economic well-being of Canadians.” (CSLS 2007, p. 2)

There are specific problems that have been identified with the typical *output-focused* measures of productivity. A physician – or other health care professional – could be very productive in terms of outputs by undertaking many activities, but those activities may not be of high *quality*, or the activity (even if of high quality) may not be *effective*. Indeed, there is a growing consensus that productivity measures must be focused on outcomes as opposed to outputs, and further that these outcomes need to consider the patient (including the quality of life), health providers and system concerns (Evans *et al.* 2010). As was identified in the CSLS (2007), “Productivity measures should be based on data that tell us whether a patient got better from a treatment rather than data which simply tell us that a patient received a treatment... the data needed to measure productivity in terms of health improvements are not readily available in Canada due to a reliance on an input-based method of measuring health output. Additionally, productivity estimates will be dependent on how the output is valued.” (p. 36). This focus on outcomes as opposed to outputs may also address some of the increasing difficulties in measuring physician productivity with the shift to Alternative Payment Plans (APPs). It is also critical to consider outcomes that are as proximate to the activities undertaken by physicians as possible.

In order to measure productivity, a clear definition needs to be agreed upon. A conceptual idea of what a measure of physician productivity would include could look like:

$$Productivity = \frac{\sum_{m=1}^n Output_i + \sum_{o=1}^p Outcome_i + \varepsilon_n}{\sum_{i=1}^j Input_i + \sum_{k=1}^l Activity_i + \varepsilon_d}$$

Where:

- Productivity: dependent variable
- Output: variable dependent on inputs and activities
- Outcome: variable dependent on inputs, activities and outputs
- Error in numerator: error-term associated with inefficient outputs and noise
- Input: independent variables for production
- Activity: activities related to and dependent on inputs
- Error in denominator: error-term associated with inefficiency in inputs and activities
- The number of inputs, activities, outputs and outcomes are i to j, k to l, m to n, o to p, respectively. The numbers of each can be different.

Key Messages from Evans *et al* (2010) *Health Human Resources Productivity: What It Is, How It's Measured, Why (How You Measure) It Matters, And Who's Thinking About It.* (p. 1)

- Improvements in productivity are the fundamental source of most increases in the material well-being of human populations. Although a relatively simple concept, productivity can be difficult to define, and changes difficult to measure in practice.
- In principle, health human resources productivity (HHRP) should be defined in terms of the relationship between health outcomes achieved (health status protection or improvement for individuals or populations) and the health human resource inputs (time, effort, skills and knowledge) required.
- The vast majority of current HHRP literature does not consider health outcomes, often using inappropriate and misleading measures of output. For example, more MRIs or more radiologists may contribute to increased procedural output but do not necessarily result in better health outcomes or improved productivity.

SECTION 2: ORGANIZATIONAL EFFICIENCY CASE-STUDIES

Despite some of the concerns with the measurement of productivity and the lack of specific and sharply focused HHR productivity research, there are some general activities that resonate as promising practices among a range of stakeholders. As was identified at the CHSRF Roundtable Discussion of Evans *et al* (2010) report, these were:

- Optimization HHR through the alignment of role definition, training, and practice within specific settings, which we examine here in terms of collaborative and interprofessional models of care;
- Optimization HHR through analysis of practice variations; and
- Optimization HHR through the application of technology.

We discuss each of these briefly in turn.

Collaborative and Interprofessional Models of Care

Collaborative models of care – which we will use to denote within the medical profession – and *interprofessional models of care* – which we will use to denote those between the medical and other health professionals – has been identified in the literature as a promising practice not only for improving productivity but also patient, provider and system outcomes.¹ Both models can involve the *sharing* and/or *shifting* of tasks. This in turn raises issues about the competencies to undertake these tasks, but what is considered less often are the different approaches to tasks of different professional groups. A medical approach and a midwifery approach to the task of childbirth attendance, for example, can be very different with respect to outputs and outcomes.

First, with respect to collaborative care, a variety of models have emerged. Kates *et al* (2002), for example, have pioneered an innovative collaborative model of primary mental health care that integrates mental health counsellors and psychiatrists into the offices of over one hundred family physicians across Hamilton, Ontario. This model has become an innovative exemplar for how specialized services can be integrated into

¹ Keep in mind that the terms *collaborative* and *interprofessional* are often used interchangeably in the published and grey literature in Canada as elsewhere (e.g., HCC 2005).

primary care, informing policy and decision-making at both the provincial and federal level. In a discussion paper jointly developed by the CFPC and the RCPSC (2006), one of the key themes was changing models of care and collaboration. The two Colleges agreed to create and disseminate tools that address appropriateness of and facilitate efficient and effective referrals/consultations. They also agreed to work with key stakeholders to improve the integration of primary and specialty care by expanding existing models of shared and collaborative care between family physicians and other specialists in community and hospital environments, including academic health centres. The enabling roles of Information Technology in improving intra-professional relationships were also highlighted as being critical (*which we discuss more fully below*).

Key Interprofessional Recommendations from the Health Council of Canada (2005)
Modernizing the Management of Health Human Resources in Canada.

- Expand opportunities for interprofessional education and post-graduate collaborative practice.
- Enhance opportunities for professionals to work in optimal scope of practice to ensure the system's capacity to meet local patient and population health needs.
- Accelerate the shift to provider payment schemes that stimulate interprofessional teamwork.
- Resolve concerns about liability in collaborative practice.

Second, interprofessional models of care have emerged as a core focus of HHR activities at the federal, provincial/territorial, regional and organizational levels (*c.f.*, Health Council of Canada 2005). Though it emerged primarily to enhance patient-centred care (Légaré *et al* 2008), it has important productivity implications. As Quinian and Robertson (2010) recently described, “Team-based work organization has grown out of the need to find new ways to be competitive in an ever-more global economy. It is promoted as a means of *increasing productivity* by endowing employees with greater autonomy and discretion.” (p. 1, *emphasis added*). There is also evidence to strongly suggest that interprofessional model of care improves patient outcomes – reduced mortality and enhanced healthy function – as well as system/process outcomes (Légaré *et al* 2008; Gravel *et al* 2006, Health Canada 2006).

Interprofessional models of care that enable other health professions to practice to their full scope – and hence better align tasks with competencies – are seen as a critical

element of improvements to productivity. According to this argument, “organisational characteristics that foster empowerment, decision ownership, job autonomy/discretion and participation boost workers' productivity by engaging them in a more responsible and a more responsive manner.” (Dubois and Singh 2009, p. 12). Barriers to the full scope of practice were one of the key findings from a recently published, exhaustive scoping review of advanced practice nursing (APN) roles in Canada (DiCenso *et al* 2010). It highlighted how many randomized controlled trials have demonstrated the effectiveness of APNs – nurse practitioners and clinical nurse specialists – in improving patient, provider and health system outcomes, but at the same time it noted that the full contribution of APN roles to improving the health of Canadians has yet to be fully realized.

Similarly in the case of midwives, there have been calls to allow them to more fully participate as members of the maternity care team (CHSRF 2006). Such calls are based in the evidence, recently synthesized in a Cochrane systematic review (Hatem *et al* 2008), which found several benefits of midwife-led care for mothers and babies – reduced use of regional analgesia, fewer episiotomies or instrumental births, feeling in control during labour, having a spontaneous vaginal birth and initiating breastfeeding – and no identified adverse effects.

Cruickshank, C., & Fraser, K. (2010) *Models of Care Initiative in Nova Scotia (MOCINS)*. <http://wordperson.ca/wp-content/uploads/2009/12/IWK.pdf>

- Strategy aimed at optimizing the utilization of the health care workforce to ensure patients have access to the right providers at the right time.
- Viewed as an essential building block to achieve sustainability surrounding the growing health human resource crisis.
- Implementation follows a series of ‘waves’, the first of which involves 14 inpatient showcase units through the development of initial functionality (e.g., roles, processes, supporting technologies and information infrastructure) at each implementation site.
- Results highlighted potential savings for system in the form of lower lengths of stay, fewer ER visits/readmissions, more satisfied staff.
- MOCINS is demonstrating promise in terms of efficiency and quality for patients and families, providers, and the health care system.

Thus, the literature on collaborative and interprofessional models of care suggests certain HC professions (such as APNs and midwives) are able to share and/or have

tasks shifted to them with positive outcomes, but there have been few specific analyses of the impact of these models on physician productivity or overall HHR productivity. Evans *et al* (2010) do caution that “The demonstration of the possibility of substitution is not, however, in itself evidence that intermediate level personnel represent an improvement in HHRP [Health Human Resource Productivity].” (p. 20). In a scoping review by the Michael Smith Foundation for Health Research (2009), they found that, “virtually no work was found on the HHR implications of the increasing use of multi-disciplinary teams and interprofessional collaboration, the use of other types of health professionals working to their full scope of practice, ... or their impact within and across different health care sectors such as home and community care, primary care, and acute care, or about the changes or impact of change on health care professionals’ roles, especially in Canada. This is an important knowledge gap.

Variations in Clinical Practice Patterns

Another critical area to consider when developing innovative ways to improve productivity is with respect to the issue of variations in clinical practice patterns across practices, organizations and/or jurisdictions (Evans *et al* 2010). Tools such as the Institute for Clinical Evaluative Sciences Practice Atlases in the province of Ontario have revealed variations in cancer surgery, cardiovascular care and arthritis and related conditions. Some variations in clinical practice are to be expected, but when practices continue despite strong evidence to the contrary – or when practices with good evidence of their usefulness are not done, this calls into question such variations. As Scott (2005) argues “It is also important to note that productivity can be increased by doctors ... doing less of what has been shown to be least effective (e.g. antibiotic prescribing) and doing more of what is most effective (e.g. prescribing statins).” (p.14)

Clinical practice guidelines are offered as a promising practice to address such variations (Grimshaw *et al* 2004) and hence improve physician productivity (keeping in mind that these improvements are typically ‘measured’ in terms of outputs as opposed to outcomes). The data are still equivocal in regards to impact of guidelines on variations in practice patterns. For example, in a survey involving chronic care, healthcare practitioners indicate they followed clinical guidelines, but upon observation only about 50% did indeed follow clinical guidelines [*as cited in CHSRF Roundtable Discussion of Evans et al (2010) report (p. 7)*]. A recent Canadian study also concluded that the publication of guidelines around breast cancer case did not reduce variations

in surgical care (Folkes *et al* 2008). This can call into question how productive healthcare providers are that contradict guidelines by undertaking inappropriate procedures and failing to complete procedures recommended by guidelines. Part of the problem can lie in the dissemination of guidelines; simple publication is typically ineffective in changing how physicians practice (Grimshaw *et al* 2004). Implementation strategies that incorporate some form of Information Technology, such as computerized clinical practice guidelines, can help to make evidence-based decision-making routine practice in the clinical setting (Folkes *et al* 2008).

Health Technologies to Improve Productivity

The use of health technologies is another promising area that can lead to positive productivity outcomes. Many highlight how new information technologies – electronic health and medical records, telehealth, telemedicine, teleradiology, and wireless handheld technology – allow for rapid exchange of clinical data over large distances, automation of clinical, financial, administrative interactions, grant immediate access to new knowledge enabling improved communication and the integration of services (CLBC 2003, Dubois and Singh 2009; Dussault and Dubois 2003). As such, they have a high *potential* for improving flexibility and productivity, in some cases reducing the cost of service provision by freeing up human resources for other forms of direct patient care. At the same time, however, they require new investments of time and money for training in new skill requirements, particular at the outset, that need to be figured into any productivity measure (Dussault and Dubois 2003).

The overall impact of health technologies on the productivity of the physician workforce in Canada is still largely unknown (CLBC 2003, MSFHR 2009, Task Force Two 2006). According to the aforementioned scoping review by the MSFHR (2009) “Although the health system has seen the introduction of a wide range of innovations in technology, ranging from telehealth to point-of-care testing to telemedicine, only two articles met review criteria.” (p. 4). Indeed, little or no attention has been paid to innovation and increased use of a wide range of technology in the non-hospital sector, such as physician practices (MSFHR 2009) “The picture that emerges,” according to the Canadian Labour Business Centre (2003), “is one of cautioned optimism about the potential for new technology to increase physician productivity.” (p. 35).

Poole, L. (2010) *Ontario Telemedicine Network: Connecting Patients to Care, From All Across Ontario*. <http://www.otn.ca/en/>

- OTN is one of the largest telemedicine networks in the world, helping to deliver clinical care and distance education among health care professionals and patients using live, two-way videoconferencing systems and related diagnostic equipment.
- Telestroke Program:
 - The Telestroke Program provides stroke patients in remote areas of the province with 24/7 access to life-saving emergency care that they might not receive without this real-time expert neurological assessment.
 - Emergency Physicians use OTN to connect with neurologists to obtain urgent diagnosis and treatment advice, including the administration of time-sensitive medication.
- Telehomecare Program:
 - OTN's Telehomecare program uses sophisticated and easy-to-use equipment to link patients with health care professionals. The program empowers patients to self-manage their chronic illnesses thereby reducing hospital and emergency room visits.
 - OTN recently completed a successful trial of the Program involving more than 800 patients with one of two chronic diseases – Congestive Heart Failure or Chronic Obstructive Pulmonary Disorder.
 - Working with select Family Health Teams in the trial, OTN effectively demonstrated significant results:
 - 65% reduction in the average number of hospital admissions;
 - 72% reduction in the average number of Emergency Room visits; and
 - 95% reduction in the average number of walk-in clinic visits.

SECTION 3: BARRIERS & FACILITATORS TO PRODUCTIVITY INITIATIVES

Report after report in Canada highlights how despite a great deal of innovation occurring in the organizational management of health human resources, there is a parallel sense of frustration with the slow pace of change (HCC 2005).

Some of the key organizational or practice level barriers to physician productivity initiatives have included:

- *Payment methods for physicians that do not foster interprofessional practice.* Canadian physicians working under FFS, for example have been found to be reluctant to collaborate and/or shift tasks (Wranik and Durier-Copp 2009).
- *Payment methods that do not easily enable output-based measurement of productivity,* but outcome-focused models may not have similar limitations.
- *Inefficient substitutions and suboptimal interactions between physicians and other health professionals* which could lead to wasteful duplication of services. (Murphy and O'Brien-Pallas 2002).
- *Potential saving of the transfer of tasks that have not materialized.* Potential savings are dissipated through what some refer to as overtraining and time-intensive styles of practice that can make the services of less highly paid personnel more expensive. (Evans *et al* 2010)
- *Initiatives that focus more on staff types than on staff members' skills* and the effective use of those skills (Dubois and Singh, 2009).

Some of the key organizational or practice level facilitators to physician productivity initiatives that strategically try to eliminate these disincentives have included:

- *Payment methods for physicians that foster interprofessional practice.* Alternative Payment and Remuneration Methods motivate increased collaboration, interprofessional care, care continuity and quality (Wranik and Durier-Copp 2009)

- *Financial incentives, particularly those well aligned to the productivity of health care providers*, which help but may be insufficient to alleviate these barriers which require system-wide approaches (Wranik and Durier-Copp 2009).
- *Breaking down inter-professional borders allowing for greater overlap in scopes of practice* are likely to “enhance equity in the division of health care labour, create the conditions necessary for the exploration of more flexible/efficient delivery models, and contribute positively to patient outcomes.” (Murphy and O’Brien-Pallas, 2002, p. 24)
- *Evidence-based medicine can drive improved patient safety and quality of health care provision*. For instance modernizing health care infrastructure to support electronic record sharing can both improve productivity and outcomes of patients.

Key Messages from Evans *et al* (2010) *Health Human Resources Productivity: What It Is, How It's Measured, Why (How You Measure) It Matters, And Who's Thinking About It*. (p. 1)

- Past research provides few clues as to when and why decision makers make improving HHR productivity (measured “properly”) a priority. The impediments to productivity improvement include perverse incentives and misaligned objectives (e.g. other agendas take precedence). As a result, despite the fact that there are points of light scattered throughout the system, a large implementation gap persists between potential and actual improvements.
- Recommendations for further work in this area:
 - The identification and dissemination of success stories – where particular HHRP enhancements or interventions have led to improved health outcomes with similar or reduced inputs, or stable health outcomes with reduced inputs. The aim would be to find common success factors underlying such productivity gains.
 - HHRP prospective primary research; for example, evaluations of organizational, funding or programmatic changes or pilot initiatives that focus on the relationship between inputs and health outcomes/benefits.

CONCLUSIONS AND LESSONS LEARNED

In preparing this background paper we focused on what evidence there was from the Canadian context in terms of the relationship of productivity improvements to patient access, outcomes and system costs. Although there is some positive (intuitive) evidence to suggest that there is a positive correlation, our brief examination of these issues has raised as many questions and cautions as assertions.

Improving Productivity can Improve Access and Outcomes

... but improving access can be afforded by improving productivity as measured by outputs; improved outcomes may not necessarily always follow from improving access; stated another way, it is important to consider the worth of services being accessed to maximize the impact of productivity on improving patient outcomes.

... but it is important to consider outcomes at various levels including the patient, provider and system level; stated another way, we need to think about both individual and systemic productivity.

Improving Productivity can Lower Costs

... particularly if all health care providers are making full use of their skills and competencies; but if this is done by shifting tasks to 'lower cost providers' this may contradict pay equity considerations. Policy-makers need to focus their immediate attention on why health providers are underutilized, and why forms of health care delivery, which are known to enhance their capacity to impact population health are being resisted.;

... but we need to think about value for money, to whom and how we would go about measuring this.

Gaps and Areas for Future Research

- *More research that specifically targets HHR productivity.* One of the key points arising from the most recent scoping review of health human resource

productivity is that although, “virtually all health services research is related in some way to HHR productivity, ... few studies are explicit about their relevance to productivity.” (Evans *et al* 2010, p. 1). As a result, they include in their list of recommendations a call for more specifically targeted or focused HHR productivity research.

- *Research which focuses on the medical profession in combination rather than isolation and longitudinally.* As was identified at CHSRF Roundtable Discussion of Evans *et al* (2010) report, “the limited available literature which explores the concept of HHR productivity often focuses on individual professions in isolation, such as nursing or physicians.” (p. 3) It was further highlighted that, “The most reasonable approach for operational decision-making is longitudinal monitoring of productivity organizational units combined with indicators of quality of patient care.” (p. 4)
- *We need to have a better sense as to what health professionals actually do so as to provide better insights into how to achieve improvements in productivity.*
- *Need to better understand some of the unintended consequences of innovations intended to improve productivity* – again, at the patient, provider and system level.
- *Health human resources planning should incorporate recommendations from productivity research to make sure that changes reflect evidence.* As O’Brien-Pallas *et al* (2001) write: “Human capital decisions include the appropriate quantity, mix and distribution of health services – finding this balance requires continuous monitoring, careful choices... and the use of research evidence to ensure that population health needs are addressed effectively and efficiently.”

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