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Strengthening Health Systems Through Innovation: Lessons Learned

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Table of Contents

Introduction

Every developed country in the world is challenged by the increasing demands for health services and the rising costs of health care associated with rapid advances in technology and aging populations. Canada is facing similar challenges, yet has made less progress in meeting these demands when compared to other developed countries. The question is: how can Canada learn from other countries in order to more adequately prepare for the future of growing demands on health systems? The purpose of this white paper is to examine the progress made within the health systems of seven comparator countries so we may learn how they have been able to help meet population health needs more effectively and make progress in health system redesign and transformation.

The costs of Canada's health systems are consuming nearly half of provincial tax revenues, while the demands for services continue to grow, plagued by long wait times and limited integration of services across the continuum of care. When compared with other countries, the quality and outcomes of health services in Canada are ranked among the lowest of comparator OECD (Organisation for Economic Co-operation and Development) countries. The current system costs are dominated by acute care hospital services; however, chronic illness management is not as well developed for an aging population and will require innovative new approaches that can cope with the growing population demands, now and in the future. Canada's health care system needs to transform into one that is highly productive and sustainable by leveraging innovation to support the redesign of health services toward managing chronic illness and supporting population health and wellness, particularly among the elderly.

The seven comparator countries selected for this analysis and learning opportunity are countries often profiled in comparative research on health system quality and sustainability. The countries included in the

analysis presented herein are: the United Kingdom (U.K.), Australia, Germany, Netherlands, France, Switzerland, and the United States (U.S.). These countries have demonstrated progress and achievements in using innovation to transform health systems and are commonly compared to Canada on quality of outcomes and innovation.

- The **U.K.** has a historic commitment to universal and national health care, engagement in the measurement of key health indicators and a willingness to engage in open dialogue about health care reform.

- **Australia** has among the highest life expectancies in the world and is considered to have among the best health outcomes relative to their health expenditures.

- **Germany**, while considered to have higher expenditures than other countries relative to health outcomes, is by many accounts regarded as a benchmark country in terms of delivery of safe care.[1]

- **Netherlands**, while having higher mortality rates than other OECD countries, is by many accounts a top ranking country in health quality.[2]

- **France** was rated by the World Health Organization (WHO) in 2000 (the last year WHO ranked health systems) as having the best health care system in the world due to their commitment to universal coverage alongside high quality of care and health outcomes.[3]

- **Switzerland** ranks among the highest in terms of health care expenditures, but has citizens who are satisfied with the health system's performance and enjoy low wait times and easy access to high-technology care.

- The **U.S.**, while having the highest overall health care costs and a lack of commitment to universal health coverage, maintains a solid reputation for having some of the world's best-equipped health facilities with highly specialized services.

As the population in each country continues to age and requires increasing levels of health services to maintain health and wellness, sustainability of health systems will be an important goal to maintain population health over time.

The overall objective of this white paper is to identify opportunities for learning from these countries and to apply these "lessons learned" to augment and stimulate innovation, in order to transform Canada's health care system.

The framework for this comparative analysis focused on four key characteristics that reflect the ability of a country's health system to effectively and sustainably respond to the health and wellness needs of its population. These four characteristics are:

1. Governance structure and financial models for funding health services;
2. Quality of population health outcomes;
3. Role of consumers in managing health and wellness; and
4. Evidence of system redesign and transformation using innovation.

This white paper is organized into four main sections. The first section sets the stage for the country level comparisons by providing an overview of the key challenges facing the health care systems of developed countries around the world, namely: shifts in population demographics and social characteristics; the balance between containing costs while

maintaining access and quality, and the fragmentation in health care delivery models and bias toward acute care versus managing chronic illness within a health and wellness framework.

The second section of the paper examines the different health system governance structures and limitations of the health care models used by the comparator countries. This analysis compares and contrasts the health system structures and then analyzes common features of governance and financial models used to fund health systems relative to the population health needs.

The third section of the paper profiles documented evidence of health innovation in each of the comparator countries to address their health system challenges. Qualitative analyses of health innovation initiatives examined how health service delivery models have evolved in each of the comparator countries to meet population health challenges. Patterns and trends in the use of innovation to redesign health services and meet population health needs were identified to yield the results, or lessons learned, from the seven comparator countries.

The concluding section of the paper summarizes the lessons learned, which form the basis for recommendations for learning opportunities for Canada. This section is intended to stimulate thinking and dialogue about strategic approaches to innovation and health system transformation that can lead to more effective and productive health care systems, and prepare Canada for an imminently challenging future.

Global Health System Challenges

The health care systems of developed, industrialized countries are all facing similar challenges associated with ever-increasing demands for health care services that are quickly outstripping the capacity of their systems to deliver health care. The resulting limitations for achieving key objectives for access, quality, efficiency, cost and value have called into question the sustainability of global health care systems. Among the countries in this analysis, there is an imminent drive to find solutions to stimulate health system transformation through health system innovation.

There are three key global health system challenges posing significant strain on the health care systems of developed, industrialized countries around the world. The following analysis is not intended to be an exhaustive review of population health trends and challenges; rather, it is designed to inform the context of the health challenges each comparator country is currently experiencing, which include:

1. Shifts in population demographics and social characteristics;
2. Balance between containing costs while maintaining access and quality; and
3. Fragmented health care delivery models and bias towards acute versus chronic illness service delivery.

Challenge 1: Shifts in Population Demographics and Social Characteristics

Aging Populations

The populations of the countries included in this study are aging. As populations grow older, the needs and demands for health services grow and shift in complexity. The percentage of citizens greater than 65 years of age in our comparator countries has increased significantly between 1990 and 2010 (see Figure 1). Population aging in Germany, Switzerland, France and the U.K. is well advanced compared to Canada, Australia and the U.S., none of which (as of 2009) have reached the 1990 prevalence of elderly citizens of the former countries. In Canada, the percentage of the population greater than 65 years of age is predicted to rise to 18.2 per cent by 2020.[4]

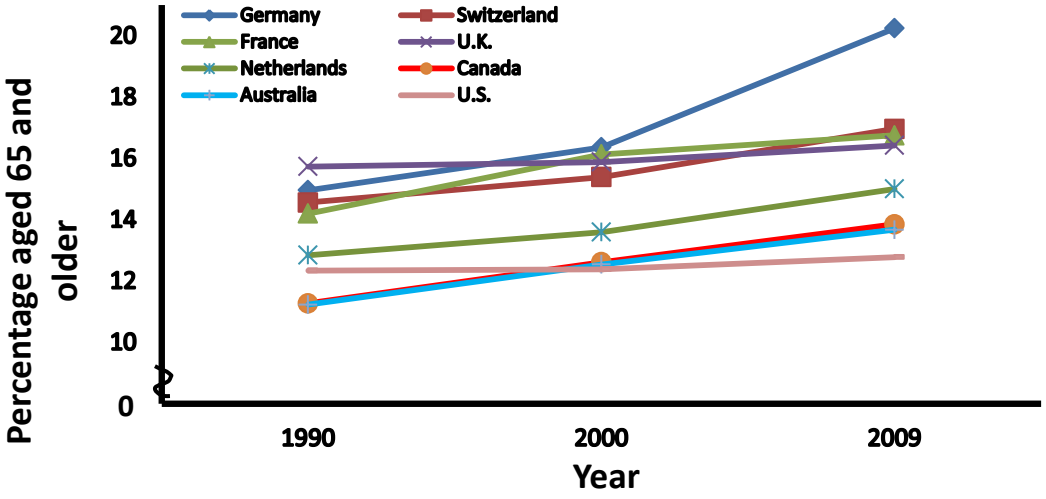

Figure 1. Percentage of population over 65 years or age in comparator countries. (Source: OECD Health Data 2011: Frequently Requested Data. Available at: http://www.oecd.org/document/30/0, 3343,en_2649_34631_12968734_1_1_1_1,00.html)

Similarly, the life expectancy beyond age 65 is approaching 20 years in many developed countries[5] including the comparator countries in this paper (see Figure 2). As life expectancies increase in developed countries, aging populations put pressure on health care systems to create supportive environments, living conditions and other appropriate structures that can respond to the needs associated with increased prevalence of cognitive decline, functional impairment, disability and need for chronic illness management.[6] In addition, an aging population places significant stress both on formal, long-term care institutions and on family members and friends providing informal care, accounting for substantial cost pressures on the system. Health spending in Canada is reported to be 4.7 times higher for citizens greater than 65 years of age than citizens less than 65 years of age and accounts for approximately 40 per cent of total health spending. The sustainability of such a system is challenging as the number of citizens over age 65 years continues to rise.[4]

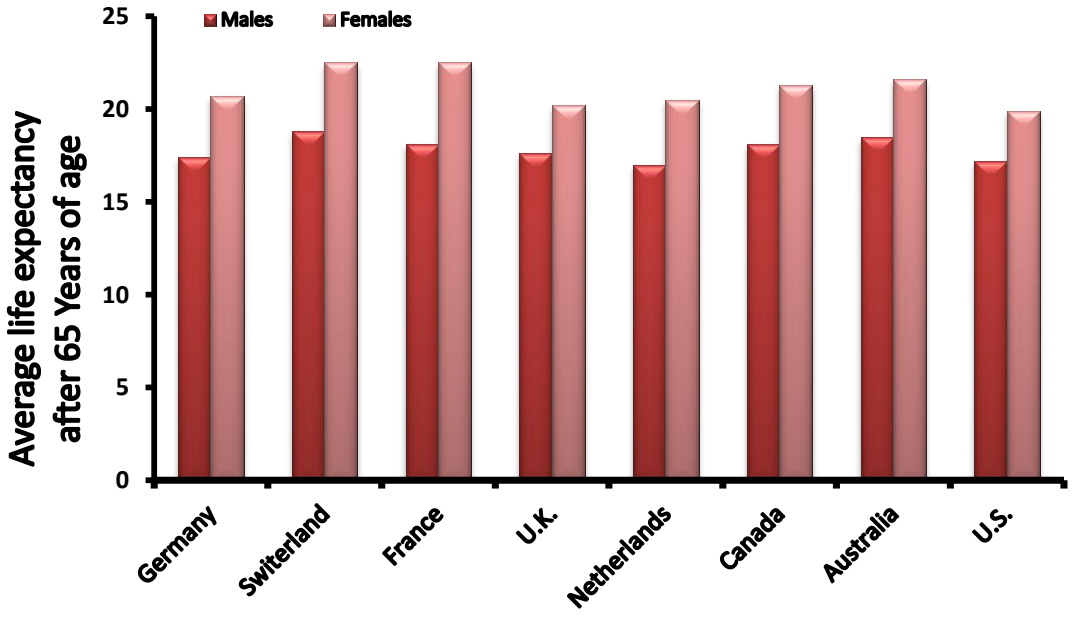

Figure 2. Life expectancy of population over 65 years of age in comparator countries. (Source: World Data Bank. Available at: http://data.worldbank.org/indicator/SP.POP.65UP.TO.ZS)

Chronic Non-Communicable Diseases and Chronic Illness

Health care systems in many countries, including Canada, were originally designed in the 1950's during a rapid industrialization period wherein economies shifted from being focused largely on agriculture to being focused more on manufacturing, drawing many families into urban cities for employment opportunities and wealth generation. The lifestyle of populations in urban settings differed in terms of physical activity, nutrition and stress, which is a large contributor to the trends in chronic illness seen today. In the 1950's, the dominant population health needs included acute illness, injury and communicable diseases, which were best managed within institutional settings such as hospitals. This hospital-centric model of health services centered on acute care has continued into present day despite the shift to population health needs for chronic illness management services. Rates of chronic illness continue to climb with the growing number of elderly citizens coupled with increasing life expectancy in many developed countries. The WHO reported that non-communicable diseases were the leading cause of death worldwide in 2008, accounting for 63 per cent of deaths, with chronic progressive conditions, such as cardiovascular diseases, cancers, diabetes and lung diseases, accounting for the majority of that burden.[7]

Diabetes is one example of a chronic disease with the potential to make a substantial impact on the sustainability of health systems. Reports estimate that up to 350 million adults have diabetes[8] worldwide and that these individuals require approximately two to three times the health care resources than individuals who do not have diabetes.[9] On average, [9] expenditures on diabetes are expected to account for approximately 12 per cent of total health expenditure worldwide, with more than three quarters of those expenditures attributable to individuals between the ages of 50 and 80 years, 53 per cent of whom are women.

Chief among modifiable risk factors for chronic disease conditions are alcohol abuse, smoking and obesity precipitated by an unhealthy diet and insufficient physical activity. The WHO estimates that the worldwide prevalence of obesity has doubled from 1980 to 2008. The WHO 2011 statistical report indicates that 30.2 per cent of males and 33.2 per cent of females over the age of 20 years in the U.S. are considered obese, with similar or even higher numbers emerging in many other developed countries.[10]

In Canada, as in other developed countries, childhood obesity is also a growing problem,[11] so much so that Canada has the first generation of children who may not outlive their parents due to early-onset obesity-related health conditions. The impact on health care systems of this large proportion of the global population who are obese becomes obvious when considering that the long-term consequences of this burden have yet to be realized.[12] Health systems worldwide are coming under increased pressure to deliver effective early-stage interventions that either prevent or effectively treat chronic disease conditions and their risk factors. Those systems that fail to do so face increased costs resulting from delayed detection and treatment of individuals in advancing stages of a pathology, which is known to place heavy burdens on acute care resources.

Advanced Health Technologies

The desire to take advantage of new, more effective approaches to health care brought about by advances in both medical technologies and information and communication technologies continues to exert both positive and negative pressures on health care systems.[13]

Indeed, advancements in readily-usable health technologies offer possibilities such as:

- More sophisticated diagnostic procedures for early detection and less invasive surgical procedures;
- Reduced complications and disability due to greater precision and accuracy;
- Advanced chronic illness management using medical devices, electronic health records, e-health and in-home monitoring;
- Reduced hospital admissions and length of stay;
- A shift towards ambulatory and out-patient care models;
- Improvements in health system operations;
- Improved scope of medical training and increased specialization; and
- Improved access to care in rural and remote areas.

However, these technological advancements simultaneously present challenges to health systems. Availability and demand for new health technologies and related high-technology medical interventions contribute significantly to upfront health care costs required for acquisition and use of the technologies as well as any associated training and resources. Moreover, complex health technology assessments are required to ensure that the technologies are indeed useful, safe and cost-effective. There are also challenges to timing their adoption, regulating their use, and in ensuring adequate access and affordability, especially for lower-income individuals.[14,15] Health systems face significant challenges when technologies are simply 'imposed' on the health care system with the expectation of improving care, rather than paying particular attention to how those technologies might be leveraged to

redesign health services to achieve greater quality outcomes, efficiency and new models of community-based care.

Challenge 2: Balance Between Containing Costs While Maintaining Access and Quality

The growing demand for health services in many countries has resulted in substantial attention to cost containment strategies put in place to provide health care services within the limitations of national resources. Shifts in population needs related to health and social support have placed increasingly overwhelming demands on scarce health care resources,[16] which are stretched very thin as decision-makers juggle budget resources and the demands for health services to achieve desired goals and health outcomes for patients. Health care systems strike a fine balance between the key objectives of cost, access to care (i.e., universality, equity, equality, responsiveness and choice) and quality outcomes that achieve population health and wellness. These objectives are inextricably interwoven, and a major challenge for developed countries today is to contain their health care costs at a level that also affords the system's commitments to access and quality. [17-20]

According to the OECD, there has been a steady increase in health expenditure as a percentage of GDP among countries such as Canada, U.S., France, Germany, Netherlands and Switzerland, who are all spending above 10 per cent of their GDP on health, with the U.K. not far behind.[5] These health care expenditures have not been without value, as the OECD suggests that increased spending has been largely responsible for improvements in health outcomes and life expectancies; however, it is important to note that the magnitude of health care spending does not necessarily translate into better access or quality of care.[21] For example (see Figure 3), there is only a modest regression coefficient (0.34) if per capita health expenditure data is plotted against the country scores from

the 2010 Euro-Canada Health Index[22] – a proxy for health system performance based on a population survey of health consumers. Netherlands, Germany, France and Switzerland all ranked in the top five countries in the 2010 Euro-Canada Health Index, while the U.K. and Canada ranked 17th and 25th, respectively, out of the 27 countries included in the study (Australia and the U.S. were excluded in the analysis). Considering its high level of per capita health expenditures, Canada's poor performance suggests that Canadian consumers should expect more from their system given the level of spending. Indeed, there is no clear evidence that countries that spend more on health care, such as Canada, Switzerland and the U.S., have proportionately increased levels of consumer satisfaction or greater population health outcomes. Similar conclusions have also been reached by other studies demonstrating weaker relationships between health care spending and performance in access or quality,[1] which points to significant efficiency gaps. Given that high health care expenditures compete with opportunities for other important social expenditures such as education, there is mounting pressure on health systems to better understand and justify their rising costs.[13]

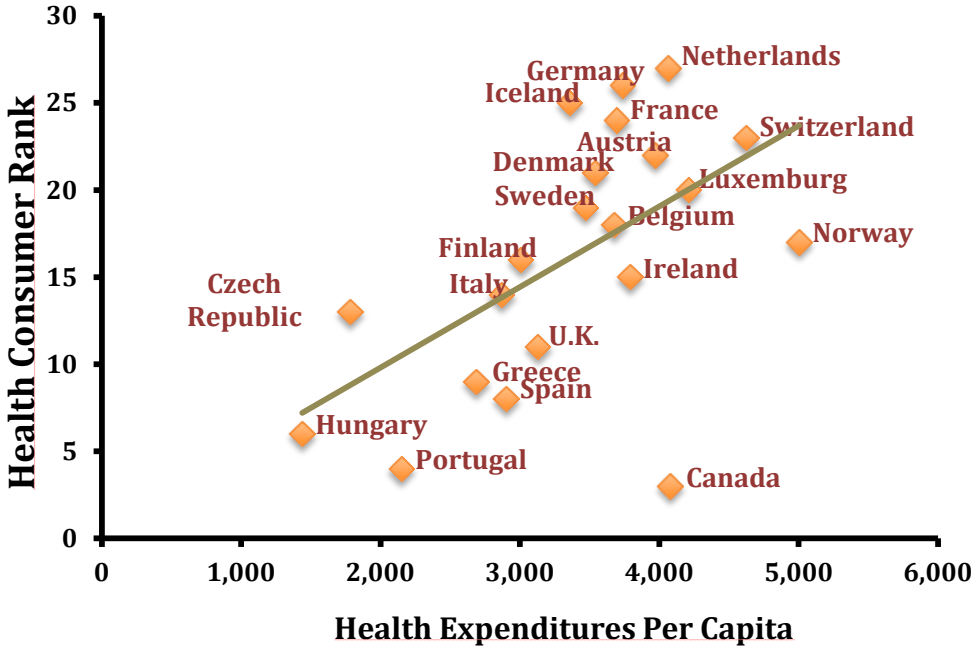

Figure 3. Country scores from the 2010 Euro-Canada Health Index as a function of per capita health expenditures. (Source: Authors' own analysis based on OECD expenditure data and Euro-Canada Index rank)

The following sub-sections present key concepts related to cost versus value and the struggles faced by developed countries in trying to contain costs while maintaining access and quality. There have been a wide range of cost containment strategies used by the eight countries in this analysis, reflecting the pressures each country faces in managing the costs of health care services. These cost containment strategies, categorized as 'supply side', 'demand side' and 'market mechanism' strategies, are depicted in Figure 4.

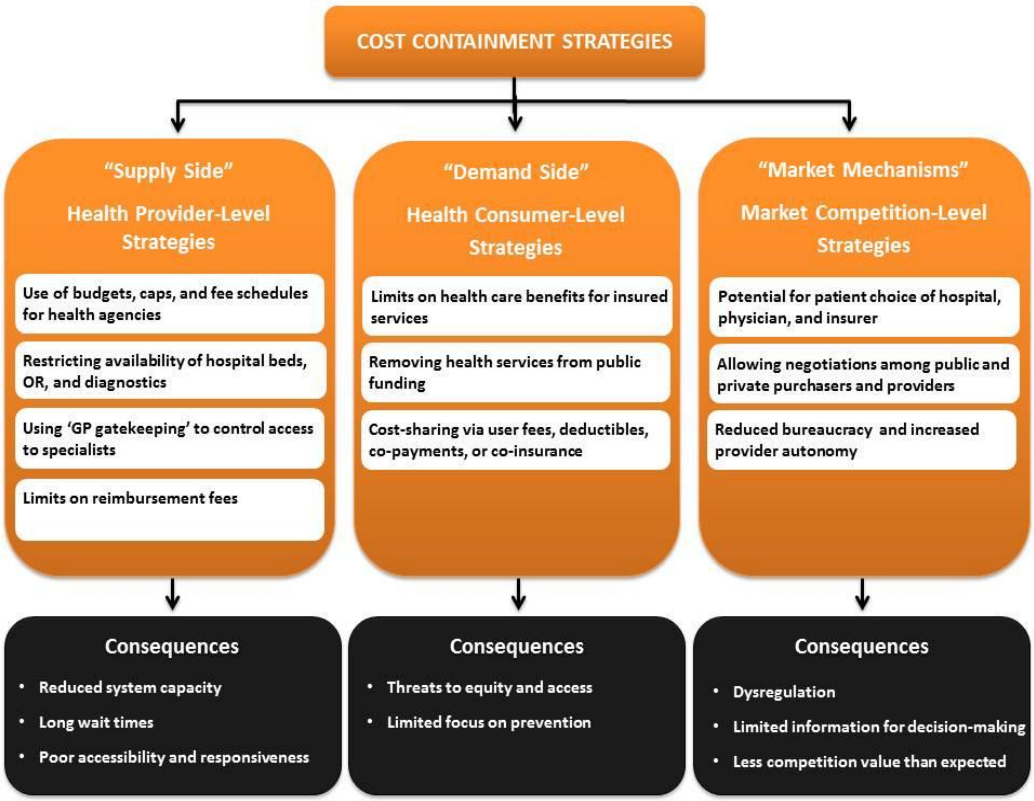

Figure 4. Overview of strategies used to contain health care costs.

"Supply side" (Health Provider) Strategies

Supply side strategies are approaches that limit the availability of health care services by limiting physician fees, availability of hospital beds or capacity for services such as surgery or diagnostic imaging. Supply side strategies for cost containment are deeply rooted in national health systems. These strategies seek to limit or contain the costs of health services by restricting the availability of health services by capping the budgets of agencies/organizations that deliver health care services, dis-incentivizing and regulating against over-provision, and reducing system capacity. The use of global budgets for health agencies has been a common approach to cost containment in publicly funded health care systems, such as in Canada and the U.K., where health care budgets represent an obvious ceiling or cap that aims to limit health spending.[17,23] Limiting physician reimbursement fees and/or limiting the number of

costly procedures (surgery, diagnostic imaging) available to a population reduces the costs of available health services.[24] Examples of common approaches to contain costs include the use of fee schedules, controls over length of stay, technology assessments, health coverage limits and insurance premium caps in social insurance systems.[20,25]

Gatekeeping is another strategy used to contain costs by controlling access to specialist services, which tend to engage more expensive use of resources. Capitation is a strategy used in the U.K., and more recently in France, Germany, Netherlands and Canada, whereby there are financial incentives to reduce utilization of services. Capitation models can also incorporate adjustments based on the health status of the enrollees as well as incentives for meeting quality and performance benchmarks in order to counteract the potential for under-treatment of consumers in order to meet capitation targets.[26]

Each of these strategies places limits on health spending while at the same time reducing the availability of health services for the populations served. Unfortunately, cost containment via supply side restrictions has resulted in constrained systems that operate under enormous pressure to allocate resources for health service delivery. The consequences are often long wait times, poor responsiveness to health needs and reduced access to physician care. Typical measures of health system capacity include the number of hospitals, doctors, nurses and diagnostic equipment per capita. Of the eight countries profiled herein, Canada's rank is third-lowest in number of nurses, tied for the second-lowest in bed capacity and tied for the lowest in number of doctors.[5] Unlike other health systems where restrictions on choice and use of health care services are determined by insurance coverage and managed care plans, it is suggested that in Canada the use of health care services is limited more simply by supply.[27]

"Demand Side" (Health Consumer) Strategies

Demand side strategies aim to contain cost by reducing demand for care, which is typically achieved by placing limits on health care benefits for insured services or by introducing cost-sharing by requiring co-payments, user fees, high deductibles and/or co-insurance. In Canada, demand side strategies have included removing health services from the publicly funded health system. Demand side strategies are unpopular because they can all too easily threaten equity and access to services, with lower income individuals more likely to avoid seeking care as a result of having to fund co-payments for health services. Further, demand side strategies tend to have the negative effect of reducing availability and access to primary care services, which limits preventative care and health promotion services for populations. Another limitation is that supply side restrictions on top of demand side cost-sharing leads to consumer dissatisfaction due to frustrations associated with being unable to access health services.

"Market Mechanism" Strategies: The Use of Competition

Proponents of market mechanisms believe that it has become impossible to get more value (better quality for lower costs) out of a health system without competition. A number of market-oriented reforms were, therefore, introduced into health systems, including patient choice (choice of hospital, choice of physician, choice of insurer, where applicable); competition among both providers and insurers on the basis of price, quality and/or accessibility; negotiations and contracting between public purchasers and public or private providers to encourage price competition; and reduced bureaucracy and increased provider autonomy for planning and implementing internal changes.[17]

However, there are basic problems with market mechanisms that can limit their effectiveness. For example, lack of alternatives, or a small

number of providers, in a region may mean that these providers - powerful hospitals, often - enjoy 'market power' and can enter into contracts and set prices for their own advantages. Objective quality comparison data has not been easy to produce to allow for real competition to occur, while lack of information infrastructure creates switching costs because health records are not easily transferable. Thus, any market competition strategy relies on informed consumers and decision-makers; however, lack of information to guide decisions is a major challenge. Consequently, most health systems do not consider that market-oriented mechanisms should supplant regulatory mechanisms as the preferred means of achieving efficiency and cost reduction.[23]

Challenge 3: Fragmented Health Care Delivery Models

The health care systems of all comparator countries demonstrated significant evidence of fragmentation of health care services. Current health system structures are characterized by medical care focused institutions operating independently, in silos, with care providers focused on disease management for individual patients rather than population health and wellness.[28] In health systems that are dominated by acute care services, a general practitioner-specialist split is commonplace as the hospital is the default setting for specialists who need access to hospital equipment for diagnosis and treatment, while general practitioners work more directly with patient populations in community settings.[29] As health systems continue to develop, this fragmentation has become more magnified by the number of venues that patients are required to visit (including diagnostic centres, pharmacies, home care agencies, acute care hospitals, skilled nursing facilities and emergency departments) in order to seek care. The involvement of multiple caregivers who have emerged to provide different forms of care

(including primary care physicians, nurses, pharmacists, specialists, medical assistants and other health professionals) has added further complexity and fragmentation to health systems.[30] The result of multiple, independent service delivery models for patients, is a highly complex system that requires considerable time and skills in system navigation to seek health care. Accordingly, the need to integrate the system from the perspective of the patient has become paramount.

Fragmented health care systems are not able to respond adequately to the pressures brought about by population aging and the burden of chronic disease.[29] Accordingly, a lack of integration and failure to coordinate care has been identified as a leading cause of inefficiency, waste, and avoidable errors.[30,31] In a fragmented system, patients may be diagnosed and treated repeatedly, with little progress made in managing their chronic illness or achieving health and wellness. Quality of care suffers as communication between care providers is severely limited and confusing, patients receive insufficient follow-up and may even receive dangerously conflicting medication and treatment plans.[29,30,32]

Further, fragmented systems are not geared toward preventative care[29] or to designing safe, effective and efficient longitudinal processes for patients with chronic conditions.[33] Fragmented systems are particularly problematic for patients with multiple chronic conditions such as the elderly and those with complex specialist needs for cardiac care, cancer treatments or diabetes management, which inevitably requires services from multiple health and social care providers.[29] Both single-care episodes and long-term care, as well as home and community care, are likely to cut across the boundaries between health care providers within delivery systems. In fact, one U.S. study suggests that Medicare patients with several chronic conditions may visit up to 16 physicians a year.[34]

Unfortunately, fragmented services focus on maximizing efficiencies within individual silos, which makes integration difficult and adversely affects the quality of patient outcomes. Transitions from acute care into long-term care pose a particular problem for integration and are made more difficult within health systems where social services and health care are divorced in policy, administration, funding and delivery. Although the health system in the U.S. has often been singled out as being particularly fragmented and uncoordinated,[33] it is not unique in having a diverse delivery system. Indeed, numerous countries including Canada, Germany, Australia, France, Netherlands and Switzerland have consistently expressed dissatisfaction with the low levels of coordination and integration in their health systems. For countries like Germany and Switzerland, the problem of fragmentation is exacerbated by historical lack of gatekeeping functions. Countries like Canada and Australia have an additional integration challenge due to their vast geography, which has resulted in many sparsely populated, rural areas with little access to care. This creates an integration challenge to combine the efforts of scarce services, link to distant specialist services and coordinate special programs with mainstream health services.[28] The need to develop a more integrated delivery system has emerged in systems like the U.K., which, despite being a single payer system under a single administration, has become increasingly fragmented in the delivery of care due to purchaser-provider splits, distribution of responsibilities across strategic health authorities, primary care trusts, foundation trusts for various acute and specialist care, private and voluntary sector providers, and local authorities which are responsible for social care.[29]

Addressing the flaws in care coordination is more difficult than the quality improvement work that may take place within an individual provider site because coordination requires the coherent efforts of a number of providers across the full range of the health care delivery system to work together.[30] Moreover, there are other stumbling blocks to

achieving care coordination such as a lack of adoption of information and communication technologies to facilitate information flow within and between providers,[31] lack of appropriate incentive structures for rewarding collaboration and care coordination among providers, and lack of financial models that support and drive system change and innovation.

There were remarkable similarities in the challenges faced by health systems in each comparator country. In every case, aging populations with increasing life expectancies and increasing rates of chronic illness were prevalent issues for each country. Many countries, such as Germany, France, the U.K. and Switzerland have older populations than Canada. A number of the comparator countries had much higher levels of consumer satisfaction with health care services compared to Canada, despite Canada spending more on health services than most other comparator countries. Cost containment strategies have focused largely on global or fixed budgeting and reducing or containing reimbursement for fees and services. There was less frequent evidence of cost containment focused on reducing consumer demand for services among the comparator countries. In every case, cost containment approaches have not yielded substantial progress in health system sustainability.

In order to more fully understand the use of cost containment strategies and the approaches each country has taken to manage the growing demands on health care systems, an analysis of the health system structures and hallmark features of each country was undertaken. The analysis that follows provides an important context for understanding the approach to health system innovation in each comparator country.

System Structure and Hallmark Features of the Health Care Models Used by Comparator Countries

The unique governance structure and funding models of the health care systems in each country were examined to identify how these features create the context and the conditions for health innovation in each country. This analysis provides an important context to understand the culture and philosophical basis upon which innovation strategies are implemented in global health care systems.

The following analysis highlights the similarities and differences across health care systems in the comparator countries. The first level of analysis focused on the governance of each country's health system, defined as the organizational and governance structure used to control or direct health system decisions, setting policy for how health systems function and how health care services are organized. The second level of analysis focused on the key features and characteristics of each type of health system structure.

There are three types of health system governance models evident in the comparator countries. The three distinct models of health systems are described as: the '*State as Owner-Operator Model*'; the '*State as Guardian Model*', and the '*Private Mixed Model*'. Figure 5 illustrates the fundamental characteristics of each model and the countries which ascribe to each model. A detailed analysis of the strengths and features of each model is described below.

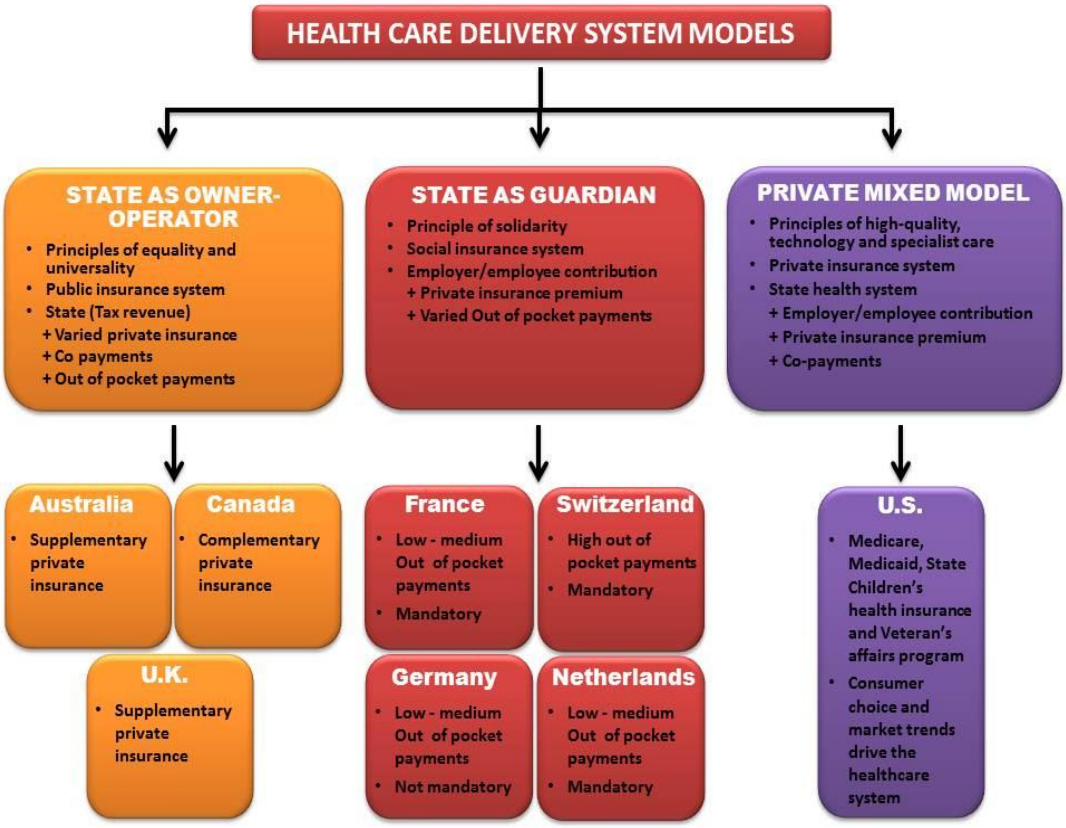

Figure 5. Structure and key features of the health care system of the comparator countries.

'State as Owner-Operator' of Health Care Services: U.K., Australia and Canada

Countries such as the U.K., Australia and Canada are best characterized by a 'State as the Owner-Operator' structure of health care services, wherein the State is the "owner and operator" of the health system providing the operational and strategic direction of the health system in each country. The government is the single-payer in the national health system, providing public health insurance to ensure universal coverage for a specified package of benefits. The U.K., Australia and Canada are often referred to as having 'Universal Health Care' or 'National Health Care', built on the moral foundation that no one should refrain from

seeking care from fear of consequences, including any financial adversity.[23] Generally, the system primarily relies on far-reaching revenue financing raised through broad-based taxes at national, provincial and local levels, often with various forms of fund-sharing arrangements between federal and local levels. There is a high degree of involvement by the state in the delivery of health care services, often through public providers operating within system level budgets. In these health systems, physicians are reimbursed according to state-determined fee schedules or salaries, similar to public employees.

Key Features, Differences and Limitations

The governance structures of each of the three countries with universal health systems have two general distinctions from the other countries in the analysis: the level of control exerted over public/private services and the role of the consumer.

Control over Public/Private Services. In universal health care models, the state exerts significant control over publicly versus privately available services. Both Australia and Canada have implemented decentralized systems in which the delivery of health care falls under the jurisdiction and responsibility of each country's states or provinces. As a result, both countries typically lack consolidated national-level strategies for the organization and delivery of health care services. Among the three countries with national health systems, the U.K. is the only one that manages its health care at the national level. Canada is the only country that does not allow for privatized physician practice, which means all physicians practice within publicly funded service delivery models in each province, and access to specialists is controlled, while in the U.K. and Australia, specialists are allowed to maintain private practices. In the U.K., gatekeeping or commissioning by primary care physicians plays an important role in controlling access to specialists and

more expensive hospital services. Patient cost-sharing is typically kept to a minimum; however, in Australia, it is not uncommon for their systems to rely somewhat on cost-sharing and out-of-pocket payments from consumers. For example, out-of-pocket payments in Australia accounted for 17 per cent of 2007 to 2008 health expenditures.[35] In Canada, there is no cost sharing for publicly funded services; however, out of pocket payments for health services (i.e. not publicly funded) are estimated at 29.5 per cent.[5]

Role of the Consumer. The role of the consumer in national or universal health care system structures is somewhat passive. As care recipients, patients have few choices since the State determines what care is offered, where it is offered and how it is accessible. While some inherent competition may exist for health services that are not publicly funded, there is little competition that is able to act as a strong driving force for change or improvement. One of the few ways in which consumers can actively participate and make decisions on health services is through insurance programs. Within Australia and the U.K., private insurance is relied on to support health system costs as a strategy for cost-sharing to supplement the national benefits package. Private insurance is considered 'supplementary' in national health care systems, wherein these insured services augment State-funded health care services. This allows for augmented coverage of services that are also covered under public health insurance and can be used to 'top-up' for access to higher standards of comfort, greater choice of specialists and/or to jump-the-line for faster access. In Canada, there is allowance for private health insurance that is considered 'complementary', wherein consumers may purchase or be provided coverage for services not publically insured and may pay for access to amenities such as private hospital rooms, drug coverage and rehabilitative therapies, which are generally not provided by the national health care system.[35,36] Most of these complementary health insurance programs in Canada are a function of employee benefit

programs. Canada is the only country with this 'complementary' private insurance model, which is closely aligned with ensuring complete accessibility to health care for all citizens, one of the major underpinnings of the Canada Health Act.

While single-payer, public provision health care systems do guarantee equal access and universal care, they often struggle with inefficiencies in a number of ways including long waiting lists, insufficient investment in health care facilities, poor responsiveness to health needs and access to care, low productivity, low motivation, and lack of appropriate incentives for providers, and various forms of rationing care.[16] Consumer dissatisfaction is evident in national health systems, particularly in Canada. Many citizens in Australia and the U.K. choose to purchase private health insurance plans offering opportunities for upgrades, "jumping-the-line" or paying out-of-pocket to seek treatment elsewhere.[17] As a result, in Australia, the expansion of the private health insurance market has been encouraged and plays an important role in expanding benefits and services. However, this favours care for citizens with higher incomes which is contrary to the fundamental principle of universal health care.[36]

'State as Guardian' of Health Care Services: Germany, Netherlands, France and Switzerland

Countries such as Germany, Netherlands, France and Switzerland have very different models of publicly funded health care which are in stark contrast to the U.K., Australia and Canada. In these countries, health systems are best characterized by a 'State as Guardian' structure of health care services wherein the government ensures a minimum coverage of health care services to all citizens. The funding of health services relies nearly exclusively on privately owned and operated social health insurance agencies. Accordingly, the State is not seen to be the

owner but rather the 'guardian and administrator' of heath care services. This type of system is essentially self-regulated through competition among insurance funds and is largely managed by the insurance agencies, the care providers and the patients themselves who negotiate directly on payment schedules, services associated with quality of care, patient volumes, and so on.[37] This model is strongly grounded in the principle of solidarity because comprehensive benefits packages are required by the State to be available for all citizens. Thus, there is no risk selection and the insurance premiums are regulated; however, the actual payments for health services are operationally implemented by the private health insurance agencies and selective contracting with care providers is not uncommon. The social insurance model of health systems is funded by wage-related employer contributions and through premiums paid directly by individuals to their insurers.

Key Features, Differences and Limitations

Control over Public/Private Services: Universal Coverage through Mandatory Participation. To achieve universal health care coverage, countries including France, Netherlands and Switzerland require mandatory participation. However, Germany allows certain, typically high-income, citizens to opt out of social insurance for private insurance, which plays a *substitutive* role for funding health care entirely privately.[35] In Germany, the vast majority of citizens are covered by their statutory health insurance scheme in which approximately 180 health insurance funds or sickness funds compete for contracts to deliver services. Contributions are levied against citizens based on their gross wages and, although collected by the sickness funds, they are centrally pooled and then reallocated based on a risk adjustment formula. Since 2006, the Netherlands has had a single system of compulsory insurance for all residents, which is administered by approximately 20 private insurers offering a government defined benefits package. Individuals pay

a flat-rate premium regardless of age, gender or health status, but there is also an income related tax contribution that subsidizes premiums for low-income groups. In 1996, Switzerland turned its system of voluntary health insurance into a mandatory social insurance system. Their system has 84 insurers offering a government defined basic benefit package, but both the premium and the deductible are allowed to vary across insurers with a minimum prescribed deductible. Citizens are thus able to lower their premiums and choose policies with higher deductibles. Moreover, approximately 10 per cent opt for coordinated, managed care plans which offer restrictions on physician choice, but have lower premiums.[38]

Role of Consumer. Consumer choice among service providers plays an important role in social insurance-based systems, where consumers choose their provider of health services (i.e. physician and hospital) and in most systems have a choice of insurers or Sickness Funds. Patients have free choice of general practitioner (GP) and specialist provider, as well as choice to use a gatekeeper (France) or to opt into managed care (Germany and Switzerland). Netherlands is the only comparator country that has mandatory gatekeeping. Cost-sharing is usually higher in these countries than in the "state as owner-operator" countries as patients are required to make co-payments on insured services as well as out-of-pocket payments for services not included in benefits packages such as dental and long-term care. France relies on private insurance to cover cost-sharing and to supplement the national benefits package, and 92 per cent of the citizens have private insurance.[39] In the Netherlands, approximately 90 per cent of the citizens purchase additional coverage beyond the basic state-mandated package.[40] In Switzerland, social insurance premiums, tax revenues and out-of-pocket spending each account for approximately one third of total expenditures.

Within the social insurance model system, reforms have been challenged by the difficulties involved in raising insurance contributions to support increased costs because of the implications for wages, labour costs and Gross Domestic Product for these countries.[16] This has led to a broadening of the financial base within social insurance models to include the replacement of wage-related contributions with tax-based funding (as in France) and shifting the burden to citizens by introducing contributions to be borne by consumers rather than employers. In addition, patient co-payments (Germany) and shifting from wage-related to flat-rate contributions (Netherlands) have been two additional strategies to keep costs low. Overall, the social insurance models of health care are able to engage consumers as active participants in determining access to health care services.

'Privatized Mixed Model' of Health Care Services: U.S.

The U.S. can be characterized as a 'Privatized Mixed Model' structure of health care services. The health system is not centrally controlled by the government, but it is funded by a mix of private and public insurers, with private and public funding accounting for 55 per cent and 45 per cent of health care payments, respectively.[41] Private health insurance agencies operate alongside, or integrated with, State-run systems including Medicare, Medicaid, the State Children's Health Insurance Program and others such as the Veterans Affairs program. There are also available federally supported safety net providers and community health centres for people who lack insurance coverage; however, solidarity and commitment to universal coverage are not characteristic of such a system. Instead, the system operates at a high cost in the favour of delivering 'more is better', high-quality, high-technology, specialist care that is accessible without long waits to those patient consumers that can

financially afford to access health services. The purchase of insurance thus depends on consumer willingness and ability to pay for health care. The State does in fact indirectly fund several aspects of the private insurance model, through subsidies to private providers for offering certain services or via tax exemptions for employer-sponsored insurance, individual insurance contributions and out-of-pocket costs.

Key Features, Differences and Limitations

Control over Public/Private Services and Provision for Citizens. The exclusion of pre-existing conditions from coverage, the denial of coverage, and the inability of sick and poor individuals to pay private insurers risk-rated premiums regrettably results in large numbers of uninsured or underinsured citizens within a privatized system.[16] While almost all people over the age of 65 and approximately 80 per cent of those under the age of 65 years have insurance coverage in the U.S., approximately 46 million people (16 per cent) remain uninsured.[42] The challenge for the U.S. is one of scale. It is one of the largest populations in the world and thus the number of uninsured citizens is near the magnitude of the total population of many developed countries. There are a number of payment, insurance and delivery mechanisms from which citizens requiring health care can choose from if they qualify. Different care provision systems have developed within the U.S. to address health care issues including Managed Care, Military Care and Veterans Affairs, Integrated Delivery Services, and safety net providers for vulnerable populations such as Medicare, Medicaid, and State Children's Health Insurance Program.[43] Managed care is a system of health care provision that integrates basic functions of health care delivery, employs mechanisms to manage utilization of medical services, and determines what services cost and what providers are paid.[43] This is the most dominant system and is available to most American citizens. In the Managed Care system, the government or an employer is the payer who

negotiates and buys health insurance coverage from a managed care organization. Participants can choose from a number of approved care facilities and usually have to go through primary care providers to access specialist services. In a more contemporary Integrated Delivery system, a network of health care organizations deliver all the services necessary to complete a procedure as well as all follow-up care for a defined disease population and are held accountable for their outcomes.[43]

Role of the Consumer. In a privatized model system, health care is effectively considered as an industry underpinned by a neo-liberal philosophy that regards regulation and government involvement to be performance-inhibiting and regards free choice by patients and the market to be the best model for ensuring quality and efficiency.[16] In this way, the health care system may act as a free market where revenue models drive economic wealth that contributes to GDP; however, because health care prices in the U.S. are negotiated and set between payers and providers, it is not easy for patients to choose a provider based on price and quality of services. Therefore, health care delivery in the U.S. is in fact only partially governed by free market forces of supply and demand.[15] Hidden or shielded costs that prevent patients from being well informed in making choices about procedures also opposes free market forces in the U.S.[43]

As described, while the U.S. health care system could theoretically be driven solely by consumer choice, there are factors that may cause it to operate differently. With a multitude of private and public funding mechanisms, health care consumers should have access to a range of choices for their care which would increase competition for patient consumer business.[44] Arguably, patient consumers in the U.S. should have a large role to play in their own treatment since they are able to decide on their insurance type, physician/specialist and health care institution; however, these consumers are often constrained in their choices by the

type of insurance plan offered by their employer and the various locations where that insurance plan will or will not be accepted. Thus, consumer choice is largely influenced by whether services are covered by insurance and whether physician services are available at locations which accept a consumer's insurance plan.[44]

The structure of the health systems in each comparator country reveals important features of these health systems that differ substantially in terms of whether the government "owns and operates" the system or simply "oversees" the health system in a guardian role to ensure all citizens have access to basic health care services. The governance structure of the two types of health systems have important implications for these systems in terms of the role of the consumer who are active decision-makers in social insurance models of government compared to the more passive role in universal health systems where consumers are more often the recipients of care. The role of the consumer offers important implications for the influence of competition underlying health system structures. In the social insurance models of health systems, consumers actively participate as the decision-makers that determine the health services they will access by purchasing the insurance coverage that best suits their health needs. Since health services are actually delivered by private insurance agencies in these countries, the active role of consumers may drive competition in the health service market place which may offer a distinct advantage to the health innovation agenda among these comparator countries.

This analysis provides an important lens through which to examine health system innovation in each of the comparator countries. Transformative health system innovation in each country can be closely examined within the context of the underlying structural framework of each country's health system.

Addressing Health System Challenges Through Innovation

Each of the comparator countries in this paper have been examined for evidence of innovation as a means of meeting the current and future challenge of health system sustainability. The following analysis offers a high-level view of what these innovations may offer Canada as an important opportunity for learning. A limitation of this analysis is the reliance on published literature that describes innovation initiatives in each comparator country. Despite this limitation, the system level profiles of innovation in each country have yielded patterns and themes across the comparator countries which may offer important evidence to inform and shape health innovation policy agendas and tangible actions in the future for Canada. Innovation is first profiled in the countries with social insurance models of health care, followed by innovation profiles in countries with universal health care systems.

Netherlands

The Netherlands is considered by many accounts a top ranking country in health quality. Netherlands ascribes to the "State as Guardian" model of health care. Since 2006, it has had a single system of compulsory insurance for all residents which is administered by approximately 20 private insurers offering a government-defined benefits package. Recent health system reforms have resulted in a shift from wage-related health funding to flat-rate contributions which are kept low through competition. Individuals pay a flat-rate premium regardless of age, gender or health status, but there is also an income related tax contribution that subsidizes premiums for low-income groups. The Dutch system has reported higher mortality rates in hospital compared to other countries, although it has lower rates of acute hospital bed occupancy of

approximately 60 per cent (compared to over 80 per cent in Canada) despite the population of Netherlands being older than Canada.

Innovations

The Netherlands underwent major health system reform in 2006 and has documented a well-developed innovation strategy primarily focused on shifting health care services from a dominant acute care sector model to a more robust community-based health care service delivery model.[45] Two strategies the Dutch have pursued in their innovation agenda include shifting health systems towards community-based care models that engage consumers directly and innovations that strengthen primary care to improve chronic illness management.

Community-Based Care Models

This is an innovation that directly engages consumers in the delivery of health care services. This strategy is referred to as 'Dutch Personal Health Budgets', which builds on the existing structure of the social insurance health system that relies on market mechanisms of competition and consumer engagement in purchasing and negotiating their own health care services.[46] Consumers manage their personal health budget to plan and negotiate their own personal health care services. Consumer-directed (consumer engaged) health care in the Dutch system means that consumers coordinate their own health care services and decide who will provide their care and for what price. Thus, consumers have a clear and active decision-making role in managing their own health care.

Low et al. (2011)[47] describe that consumer-directed coordination of care has been gaining attention as an alternative to the more common agency-directed care. The consumer-directed model gives consumers greater control and responsibility for their own care coordination by allowing them to make their own choices in selecting service providers and hiring care staff using either spending vouchers/credits or the cash provided to

them. The Dutch personal health budgets is referred to by Kremer as "one of the major innovations of the Dutch welfare state."[46] The innovation was first introduced in 1996 and in July 2010, there were 123,000 personal budget holders, compared with 5,401 in 1996. Budgets help cover personal care and daily living, nursing care such as help taking medicines, support services such as daycare or rehabilitative care for managing a disability, and short stays away from home including respite care. There is some cost sharing involved but the benefits for patients include choice of carer(s) and increased adherence to their prescribed regimens.

The most substantive limitation of this model is the reliance on the consumer to make up their own minds on quality. Lack of education and information on quality or need for services may make it challenging for many consumers to adequately manage their own care needs. The Dutch model does allow for family members to be contracted as care-givers. Evidence of impacts of the model quality of care and patient outcomes is not well documented.

Innovation in Primary Health Care

The second innovation strategy in the Dutch system focuses on strengthening primary care by restructuring accountability for how primary care physicians offer care with 24/7 responsibility for their patients. Over the last decade, the Dutch have reorganized their system of after-hours primary care (that is care delivered from 5pm to 8am on weekdays and over weekends). After-hours care in the Netherlands is now organized in large-scale primary care physician co-operatives in which 40 to 250 GPs take care of patient populations ranging from 100 000 to 500 000.[48] GPs in the Netherlands commit to a 24 hour responsibility to their patients and the use of cooperatives has reduced workloads and improved on an earlier system of small rotation groups. GPs are paid per hour while on-call. GP cooperatives are usually situated

within or near a hospital. During after-hours periods, the Dutch GPs will carry out telephone consultations, supervise triage assistants, see patients and perform home visits (via chauffeured cars that are fully equipped with infusion drips and defibrillators).[48] Giesen et al's 2011[49] review of the research into the success of the Dutch approach reveals that:

a) patients report satisfaction with the use of cooperatives for after-hours care;

b) GPs are adhering to national guidelines for quality of care delivered after-hours;

c) few incidents of inadequate or suboptimal treatment have been documented; and

d) for home visits, nearly 90 per cent of patients are visited within an hour of calling and 70 per cent of those experiencing life threatening problems were reached within the target time of 15 minutes.

Recent reports suggest that the U.S. is looking closely at the Dutch model for after-hours care.[50] One problem with the after-hours cooperatives, however, is the wide variation in consultation fee prices, which have been reported as ranging from €35 to €184.[51]

Summary

The innovation strategy in the Dutch system acknowledges the importance of leveraging consumer engagement to support patients managing their own health care services and to take advantage of market competition to reduce costs and stimulate competitive approaches to health care service delivery. The second major distinction in the Dutch approach to innovation is to invest in primary care and to require accountability for providing such care around the clock to be able to

effectively respond to health needs and intervene early to avoid the need for acute care services such as hospitalization. Despite the Dutch population being older than the Canadian population, they have achieved lower rates of hospital bed occupancy and lower per capita costs of health services when compared to Canada.[52] Quality outcomes following the Dutch reform have resulted in improved survival rates, reduced mortality rates, fewer hospital admissions, and high practitioner conformity with quality guidelines and satisfaction among the Dutch population.

France

In 2000, France was rated by WHO[3] as having the best health care system in the world due to their commitment to universal coverage alongside high quality of care and health outcomes. France ascribes to the "State as Guardian" model of health care whereby the French health care system requires mandatory participation and relies on both social insurance contributions and taxes to fund the system. France relies on private insurance to cover cost-sharing and to supplement the national benefits package. Over 80 per cent of French citizens have supplementary private insurance. The French system has a voluntary form of gatekeeping and patients enjoy unrestricted access and free choice of GP and specialist providers. Although this has led to criticisms of the French system being rather fragmented, the French enjoy long consultation times with physicians[53] and have the highest number of primary care physicians per capita of the eight countries.[54] However, there are cost containment mechanisms in place such as restrictions on what can be reimbursed by private insurance, a tightening of the drug formulary in favour of generic drugs, and a reduction in acute in-patient beds.

Innovation

A major innovation focus for France has been to strengthen the availability and access to primary care services for their entire population, 24 hours a day, 7 days a week. France has also focused its innovation initiatives on ensuring that health care plans are made mandatory for chronic illness patients by exempting these patients from co-payments on their treatments.

Innovation in Primary Health Care

The French initiative, 'SOS Medicins',[55] is probably the longest running model of after-hours care operating since 1966. The service provides after-hours care for everything from emergency care to less urgent medical checkups. Each year, SOS Médecins' 1,000 doctors answer 4 million calls and make about 2.5 million home visits across France. Patients pay a charge (between 50 and 75€) for each doctor visit. This is a private provider model of care but patients are later reimbursed depending on their social insurance benefits package. Most doctors employed by SOS Médecins are contracted GPs. They are held personally responsible by the country for their actions and organize their "on-call" hours with colleagues in their area. SOS Médecins call centers are open 365 days of the year, 24 hours a day. When a call comes in to SOS Médecins, a dispatcher will triage the patient before dispatching a physician, and care is delivered directly to patients in communities when needed.

Chronic Illness Management

France has taken a number of steps in the management of patients with chronic conditions.[56] Firstly, France exempts patients with chronic and long-term conditions from co-payments on treatments for their long-term diseases provided that appropriate care protocols are in place. This helps to ensure that care plans are made mandatory for chronic patients. GPs have responsibility for putting these care protocols in place and receive

payments to provide this coordination. It is estimated that approximately 80 per cent of people with diabetes in France are covered by this arrangement.

Summary

Similar to the Netherlands, France has focused its innovation approach on strengthening primary care service delivery models with 24/7 accountability. The French system is one of the most extensive and productive primary care innovation strategies among all eight comparator countries. Chronic illness management has been implemented using financial models that incentive and support consumer engagement in managing their health and wellness, particularly for consumers with diabetes. France has one of the highest rankings on consumer satisfaction relative to health system costs per capita; however, the impact of innovation on health system outcomes is not well documented and health system innovation is challenging given the strong culture of fee for service models of reimbursement among physicians.

Germany

Germany ascribes to the "State as Guardian" model of health care. It has one of the oldest populations among the countries compared to Canada and is the only country using the social insurance type approach that allows citizens to opt out of publicly funded health care if they are able to afford private health care independently. Germany, while considered as having high expenditures relative to health outcomes, is by many accounts considered a benchmark country in terms of delivery of safe care as defined by low patient self-reports of medical error.[57] Germany allows certain, typically high-income, citizens to opt out of social insurance for private insurance, which shifts the burden to citizens by introducing contributions to be borne by employees rather than

employers as well as patient co-payments. In Germany, the vast majority of citizens are covered by their statutory health insurance scheme in which approximately 180 health insurance funds or sickness funds compete for contracts with customers to deliver services.

Innovation

Germany has focused its innovation initiatives on transforming chronic illness management in communities to support population health and community-based service delivery using approaches to engage both providers and consumers using incentives. It has also begun to leverage information technology (IT) as an innovation strategy to support the redesign of health services to achieve transformational change.

Chronic Illness Management

Disease management programs (DMPs) were introduced into the German health system in 2002 with the support of legislation that aimed to improve quality of care.[58] There are currently DMPs for six major chronic conditions, each with recommendations that specify treatments according to evidence-based guidelines, quality assurance measures, procedures for patient enrolment, training for providers, and requirements for documentation and evaluation of outcomes. Participation in DMPs is voluntary but exemption from out-patient fees and co-payments encourages patient enrolment. Providers are also incentivized via lump sum payments. Given that primary care physicians take on the role of coordinating care for enrolled DMP patients, the programs are helping to reinforce the focus on primary care and chronic disease management in the German health system.

One of the DMPs, introduced in 2003, is for the management of type 2 diabetes; over 2.5 million patients actively enrolled and participated. Szecsenyi et al.'s (2008)[59] study found that there were significant differences between patients who enrolled in this program compared to

those who accessed usual care. Enrolled patients reported significantly better involvement in decision-making, greater understanding of their care, improved goal setting, more confidence in their treatment plans based on their specific circumstance, and demonstrated improvements in follow up and coordination of care. Improvements are also expected to result from better prescribing practices supported by the DMP's evidence-based guidelines as well as evidence-based referral practices to specialists. Standardization of care for chronic illness management and reduced variations across regions are also anticipated as outcomes as these programs continue.

The next steps in the German DMP system is to adapt DMPs for multi-morbidity, to gather more evidence of their impacts on clinical outcomes, and to determine how to balance DMP standards against the needs of local communities. Another innovation focused on improving the patient's care experience is closely managing health care transitions for the frail elderly. This program, which is currently being evaluated in Essen (Germany's sixth largest city), is designed to improve the coordination and continuity of care for patients with complex needs (mostly the elderly) as they move between health care settings. This project brings together hospital physicians and GPs as well as caregivers, social workers and health insurance representatives to improve health care transitions by designing new standards for discharge procedures for patients transitioning into nursing homes, home care or rehabilitation. Pieper and Kolankowska (2011)[60] identified evidence of increased patient satisfaction, fewer discharge challenges and greater communication between clinical agencies focused on patient needs.

Consumer Engagement using "Smart Card" Technology

Germany implemented an IT strategy for managing health records using "Smart Card" technology.[61] This is consistent with their consumer-driven approach to innovation whereby consumers carry their personal health

records electronically and share it with health providers or health care agencies with a simple swipe of their smart card. The health providers use the cards to access identifying information about patients and insurance information for all citizens. Additional voluntary features available for smart card users include e-prescribing and private electronic patient record management. The card system requires patients to physically present the card for all health transactions and requires the use of a private PIN number before a health provider can access the information on the card. This design was intended to respond to concerns about privacy and accessibility of information among the general public. Although the concept of the Smart Card is very innovative, the uptake and adoption of the card system faces challenges. With 68 per cent of people identifying that they have a lack of understanding of the smart card system, its progress towards complete adoption remains slow. Confidentiality and security features are currently undergoing review, and the range and extent to which health data is available on the card remains a limitation.

Summary

Innovation in the German system is consistent with the other countries in the "State as Guardian" social insurance type of health care system. The focus of these countries is strengthening primary care and management of chronic illness in communities. The disease management program has been highly successful in incentivizing both physicians and patients to engage in quality management of chronic illness. The use of health IT in the form of Smart Cards builds on this innovation by engaging consumers further in managing and communicating their own health information, even though complete adoption of this IT strategy has not been fully realized.

Switzerland

Switzerland is among the eight countries who report one of the highest health care expenditures; yet, despite the costs, citizens are satisfied with their health system's performance and enjoy low wait times and easy access to high-technology care. Switzerland is the fourth country ascribing to the "State as Guardian" model of health care. In 1996, Switzerland turned its system of voluntary health insurance into a mandatory social insurance system. Social insurance premiums, tax revenues and out-of-pocket spending each account for approximately one third of total health system expenditures. The system has 84 insurers offering a government defined basic benefit package, but both the premium and the deductible are allowed to vary across insurers with a minimum prescribed deductible. Citizens are thus able to lower their premiums and choose policies with higher deductibles. Moreover, approximately 10 per cent opt for coordinated, managed care plans which, while offering restrictions on physician choice, have lower premiums.[38] This gives the consumer an opportunity to tailor the health care services to their individual need and budget.

Innovation

Innovation in the Swiss health care system is much more narrowly focused than other countries with social insurance models of health care; however, the following examples provide insights into early innovation approaches adopted by this health system. These approaches focus on cost containment and consumer education. Evidence of the impact of innovation strategies in Switzerland is limited. Switzerland's health system is not as highly regulated as other countries and quality outcomes are not well documented.

Innovations in Primary Care

Swiss Physician-Pharmacist Quality Circles (PPQCs) commenced in 1997 as a pilot project in the canton of Fribourg. The primary goal of the quality-circle initiative is to improve prescription practices among GPs so as to achieve costs savings without compromising quality of care. Additional goals were to improve the relationships between GPs and community pharmacists and to use the circles as a model for locally run continuing education. As of 2009, PPQCs was operating in eight different Swiss cantons.

Each quality circle is moderated by a specially trained community (retail) pharmacist and there are three to 10 prescribing GPs within each circle. The PPQCs meet regularly educating each other on practice guidelines, discussing risk/benefits of drugs in several drug classes, exploring their prescribing patterns together with issues of use and overuse, and sharing their attitudes toward such practices as antibiotic prescriptions for common infections. An important part of the work of PPQCs is to use data from insurance companies and Sickness Fund billing offices to benchmark prescription data of their GPs for both internal comparison as well as comparison to other PPQCs. GPs are able to receive feedback on their success and areas for improvement. A 2010 study[62] of the impact of the Swiss PPQCs showed that the model has been successful in improving the pharmaco-vigilance and awareness of pharmaco-economics among participants. It was found that between 1999 and 2007, the average drug cost per patient had increased by 74 per cent for non-participating physicians and only 32 per cent in the PPQCs, translating into a saving of $225, 000 per GP. Moreover, the percentage of generic prescriptions was higher amongst PPQC GPs than in the control group. The study reported that if all Swiss GPs would adopt the approach of the PPQCs, it was estimated that more than $785 million in savings could be realized.

Role of the Consumer

Despite traditional criticisms that the Swiss system is more regressive than those of other "State as Guardian" social insurance countries and that the Swiss are more concerned about cost control than patient empowerment, there is growing recognition that Switzerland is among Europe's front-runners with projects aimed at improving patient education and literacy. For example, in 2003, the Swiss embarked on the Future Patient Project as part of the broader "European patient of the future" initiative. The project aimed to describe the health care system of the future from the patient's point of view. Based on surveys, the project identified choice, participation, good information and trust as the essential characteristics that Swiss patients desired from their health system.

The focus of the Swiss on patient engagement next turned attention toward health literacy and the competencies required to engage patients and educate them on ways to reduce unnecessary consumption of health care services. This led to the development of the Swiss Health Literacy Survey (HLS·CH). This survey is the first of its kind in Europe and has been identified as a model for a broader European Health Literacy Survey. The current challenge for Switzerland is to find a way to move toward understanding how to implement the patient education process in a system where governance is highly regionalized and where adoption of initiatives is almost entirely voluntary.

Summary

The Swiss health system has achieved unique and impressive innovation in pharmacare management through the PPQC program. Savings and collaboration among pharmacists and GPs offer potential opportunity for learning among other countries. The support for consumer empowerment based on consumer choice, knowledge translation and trust, and health

literacy is a unique and important model for other countries to learn from.

U.K.

The U.K. is one of three countries that ascribe to the "State as Owner-Operator" national health system structure, which is similar in many ways to Canada's health system. The U.K. population is considerably older than Canada's, although they report lower acute care hospital occupancy rates and have among the lowest per capita spending on health care among the eight comparator countries.[5] In the U.K., as in Australia, physicians are allowed to have private practices. Consistent with most national health systems, the consumer is viewed as the recipient of care rather than viewed as an active decision-maker who determines what health services they will access and what costs are negotiable. Among all of the comparator countries, the U.K. was cited the most often for the number and range of innovative approaches to health system reform and capacity building.

Innovation

The primary focus of health system innovation in the U.K. is a shift towards community-based management of chronic illness as a strategy for decreasing reliance on hospital-based services, which are substantially more expensive and have limited capacity for utilization. The distinguishing feature of U.K. innovation is the role of the GP as the central figure in managing care coordination and directing allocation of funds to achieve health service coordination.

Innovation in Integrated Care

One of the most significant innovation strategies in the U.K. is the "*Unique Care*" program.[63] This program integrates both social services

and health services to support frail, elderly and high risk populations to maintain health and independence at home, while reducing the rate of hospitalization and emergency department admissions. Unique Care is a case-management approach that focuses on people who are at-risk for entering into a hospital for chronic illness management. The program coordinates social services and health care in order to respond to the health and wellness needs of these patients. Additionally, it seeks to educate existing personnel already involved with the patient's treatment in an attempt to promote care coordination between health professionals within the system. In this model, all referrals are directed to a practice-based Unique Care team who manages all medical and social needs of the patients. If a patient is admitted for an acute medical problem, the hospital informs the practice and the Unique Care Team of the admission who works with the hospital to coordinate care for when the patient is discharged.

Initial outcomes for this integrated care model have been documented at a pilot hospital and show a substantial reduction in the number of bed days for people over 65, which is projected to reduce costs up to £300 000/year at this institution alone.

A complementary model for the integration of health and social care in the U.K. is the establishment of "Care Trusts". Care Trusts are fully integrated NHS organizations with a strong management structure. They are responsible for commissioning and providing community health and social care services; one example is from Torbay. Since the Torbay Care Trust began providing coordinated care in 2005, the daily average number of occupied beds has decreased from 750 in 1998 to 502 in 2010. Emergency bed day use for patients older than 65 is the lowest in the region and has fallen by over 32 per cent between 2003 and 2008 for patients over 85. There has been improved use of home care services and a drop in patients living in residential and nursing homes. Patient

satisfaction was ranked the highest in the U.K.'s southwest on patient satisfaction outcomes.

The Virtual Ward

"Virtual Ward" is the second innovation initiative that supports the drive towards strengthening health care services in communities as a strategy to manage chronic illness.[64] This concept is designed to deliver community-based services to patients in their homes in order to avoid hospitalization. A Virtual Ward is a group of patients receiving care similar to that in a per cent hospital ward, but the hospital care is delivered in their homes. These patients live at home, but are high-risk for emergency admission to the hospital due to long-term conditions with complex needs. Staffing includes a community matron, who is assigned to each ward and manages its logistics and operations. Each ward also has nurses, social workers, physiotherapists, occupational therapists, and a pharmacist and ward administrator. This model has been adopted in other communities, as there is a belief that patients would rather be in their home and a perception of hospital admissions as dangerous and expensive. Virtual Wards are expected to not only improve patient safety and care, but reduce costs through reduced hospital admissions. According to The King's Fund's report on Avoiding Hospital Admissions, there has been some evaluation that shows Virtual Wards have the potential to be cost-effective,[65] but these findings are based on very preliminary results and further study is required.

Commissioning General Practitioners

Practice-based commissioning (PBC) has been used in the U.K. since 2004 as a means to devolve responsibility for commissioning health care services for patient populations to frontline clinicians in general practice. This innovation strategy mobilizes the role of the GP as the "hub" for navigating and managing care in communities. GPs are empowered in decision-making roles to improve care coordination by managing patient

pathways and referrals to hospital-based specialists as well as cross-sectoral collaboration between health and social services. GPs can use their commissioning process to challenge entrenched approaches to the provision of care and to reshape the boundaries between primary and secondary care to improve the patient's experience with the health system.[66] However, an emerging criticism of this approach is the management costs associated with the model, which have been increasing and now approach 14 per cent of U.K. health spending.[67] Other concerns surrounding whether GPs have the appropriate leadership skills for effective commissioning and design of service processes have also been raised.

Strengthening primary care

A second innovation focused on the role of the GP, which was introduced in 2004, is aimed at promoting consistency in care for patients across the country and improving quality of care by rewarding the independent primary care physicians who are contracting with the NHS to deliver high quality, evidenced-based care.[68] Under the contract, physicians are rewarded for providing services specified in a Quality and Outcomes Framework (QOF). Payments are rewarded according to the level of achievement against a range of indicators (or targets) specified in the QOF. The GP contract has helped to shift focus of health services to achieving outcomes rather than processes, and there is an increasing body of evidence highlighting the positive impact that the GP contract and QOF is having upon quality of care and in reducing gaps in clinical achievement between practices located in the most deprived compared to the least deprived communities. This initiative is similar to pay-for-performance models that are linked to patient outcomes rather than focused on process of health care service delivery. There is limited evidence to date of the effectiveness of this innovation approach on health system productivity or sustainability; however, future evaluative

studies will enable greater insights into the effectiveness of this approach.

Role of the Consumer

There are two notable strategies for innovation that are designed to enhance the engagement of consumers to manage their own health care. The first is an IT strategy that enables consumers to manage and book appointments to access health services. The NHS introduced the electronic *Choose and Book* service to enable patients to choose and book their first outpatient appointments at a time and date convenient for them.[69] The organizational impact of the Choose and Book service is related to reducing waiting times, minimizing the rate of no-shows, improving the speed of the referral process and improving service delivery to patients. They have reported a 75 per cent reduction in turnaround times for consultations with specialists since the system streamlined communication;[69] however, the system is perceived as time-consuming administratively and this perception was a reason for the limited uptake of the system.

A second consumer engagement strategy in the U.K. is NHS Direct, a 24-hour nurse-led telephone advice and information service offered to provide the public with the opportunity to obtain advice on health matters so they can be better equipped to manage their own health care. Nurses working for the NHS Direct helpline answer calls from the public and give advice on a wide range of health related issues. They use a system of computer-based decision support guidelines to offer the appropriate advice, which can range from self-care to an emergency service referral. The service has played an important role in the wider NHS landscape by taking pressure off other NHS services and significantly contributing to the £20 billion of efficiency savings the NHS needs to be able to make to keep up with rising demand for health care services. NHS Direct reduced the cost of providing services to the rest of the NHS by

£11.1 million in 2010/11. By the end of 2011/12, this will have reduced the cost of services to the NHS by £33 million a year.[70] The services provided enable patients to care for themselves, where appropriate, and reduce unnecessary emergency department visits and GP surgery appointments. During the year, over half of the patients who contacted the service were able to care for themselves with the support and advice given to them. It is estimated that in 2010/11 the core service saved 1.6 million unnecessary GP surgery appointments, 1.1 million accident and emergency urgent or emergent attendances/999 calls, and half a million other face-to-face appointments.[70]

Summary

The U.K. has one of the lowest per capita rates of expenditure among all of the eight comparator countries, yet it also reports and exemplifies one of the most active records of innovation in the health system. The substantial focus on mobilizing health services to keep patients at home, improving quality of health care in the community and avoidance of hospitalization is distinct among the comparator countries. The use of telehealth and IT solutions to engage consumers directly in managing their own health services is distinct from other countries such as Germany; however, the combination of all five innovation strategies provides evidence of capacity building and increased quality health outcomes in the U.K. system as a result of innovation.

Australia

Australia has among the highest life expectancies in the world and is considered to have among the best health outcomes relative to their health expenditures. The Australian system is similar to the U.K., whereby specialists are allowed to maintain private practices outside the publicly funded system. The Australian system relies somewhat on cost-sharing and out-of-pocket payments to manage health system costs. For

example, out-of-pocket payments accounted for 18.2 per cent of 2008 health expenditures.[5] Consumers also carry private insurance, which provides important resources for health system cost containment. Similar to Canada, Australia has implemented decentralized systems in which the delivery of health care falls under the jurisdiction and responsibility of the individual states.

Innovation

Similar to Canada, the geographic size of Australia makes patient access to care a significant challenge. To improve patient access and population health outcomes, innovation in Australia has focused on shifting from acute care to a more decentralized, community-based care model. The approach to innovation in Australia has involved creating innovation that strengthens primary health care and leverages health IT to achieve innovation.

Innovation in Primary Health Care

Since 1992, Australia has been enhancing integration of health systems and care coordination largely in remote and rural locations through Australia's General Practice Networks (GPNs). Australia has taken a network-based approach to enhancing care coordination. There are now at least 111 GPNs covering all of Australia and with a collective membership of over 90 per cent of Australia's GPs. GPNs receive funding from the Australian government and other sources with a specific mandate to improve the health of Australians by supporting local physician practices, improving care coordination, and facilitating national programmes in health promotion, early intervention and prevention, chronic disease management, mental health, and aged care amongst others. The GPNs are governed and represented by the Australian General Practice Network (AGPN). More recently, Australia's GPNs have been positioning themselves as the model upon which Australia could build its proposed national system of 'Medicare Locals'. In

2010, the Australian Government announced its intentions to invest AU$416.8 million to establish a nation-wide network of regional Medicare Locals. Medicare Locals are intended to be independent entities that "will be responsible for providing better integrated care, making it easier for patients to navigate the local health care system".[71]

Rural Health Innovation

The North West Queensland Allied Health Service (NWQAHS) program[72] was established in 2001 to improve care for key groups within the northwest Queensland rural community. The available allied health services have been selected on the basis of the identified needs of the community and are accessed through referrals via their GP. The program has increased team work, communication, and shared knowledge among GPs and allied health professionals in rural areas. Further, it has helped rural communities gain better access to allied health services outside major centres, promoted greater continuity of care and supported increased use of care planning and case conferencing.

Rural Palliative Care Services[73] commenced in 2001 as a national demonstration project to assess how a national palliative care strategy could be implemented in rural areas. The project focused on improving access to palliative services through improved referral practices and an on-call nursing roster to ensure 24/7 service delivery to improve coordination among the health care team using an electronic health record.

An innovative approach to attracting and retaining rural physicians to practice in remote communities created a practice infrastructure for physicians to support retention of physicians in rural medical practices.[74] Doctors practicing in these facilities are able to determine their hours of work, services and fee policies, which is more attractive to GPs since it enables them to work as clinicians without having to own and manage their own medical centre or make upfront financial investments. This

model has succeeded in solving medical workforce issues in rural communities by both attracting and retaining doctors, as well as facilitating greatly expanded ranges of medical, nursing and allied health services in the medical centres it supports. The model allows GPs more freedom to come and go with minimal disruption to patients since medical centre staff, infrastructure and patient records can be kept in place and managed independently of physicians practicing in these settings.

Innovations in Health IT

Telehealth technology has facilitated the transition of a primarily acute care system to a decentralized health care delivery model in communities. Australia has recently committed to an AU$620 million telehealth initiative and in June 2011 it was announced that consultations via video conferencing will be fully funded by the Medicare system.[75] Moreover, incentives are provided to physicians for using telehealth technology in their practice including startup costs of installing the technology and compensation for physicians who use telehealth for consultations. The main aim of the telehealth program is to improve access for patients in identified rural and outlying areas to consult with specialists. Services will be available for these rural patients at local GP clinics or health care facilities. Such services will also be available to residents of aged care facilities and to patients at Aboriginal Medical Services locations. Payments are also applicable for the GP, nurse, midwife or Aboriginal health worker assisting the patient during the telehealth consultation. Australia plans that half of a million telehealth consultations will be taking place by 2015.[76]

Summary

While enjoying one of the highest life expectancies in the world and best health outcomes relative to expenditures, Australia is focusing innovation efforts on addressing the challenge of ensuring citizens living in remote

communities have access to quality health care services. In order to improve patient access to care, health service delivery has been redesigned, using networks of GP's with 24/7 accountability and incentives for augmenting access to services using telehealth technology to access to care.

U.S.

The U.S. reports the highest health care system expenditure of any other country in the world. The per capita costs of health care in the U.S. are more than double that of any of the other comparator countries in this analysis. This is primarily a function of the heavy reliance on technology and "over-provision" of care in a heavily privatized health care system. There are features of publicly funded health care for the elderly (e.g. the Medicare program) and low income population (e.g. the Medicaid program); however, despite these programs over 40 million Americans are considered uninsured today without access to health care services.[42] Health care is a major focus of reform in recent years as the current privatized system of health care is accounting for an increasing percentage of the GDP in the U.S.

Innovation

The unique private health care system of the U.S. limits access to health care based on the ability of the consumer to purchase health insurance. Innovation in the U.S. has focused primarily on system integration, continuity of care and use of health IT to support innovation in health service delivery that is attractive to health consumers. However, the U.S. system is largely consumer driven, and therefore readily adopts new technologies as a strategy for attracting privately insured patients and generating revenue.

Innovations in System Integration

There are a small number of states in the U.S. which have focused innovation efforts on integration of health care services to provide continuity from primary care through acute care hospital settings and to community settings following discharge. These include the Geisinger Health System in Pennsylvania, the State of Vermont Integrated Health Services model and the Ambulatory Practice of the Future (APF) at the Massachusetts General Hospital. Each of these systems uses innovation to increase access to care, improve communication and collaboration across the continuum of care, and increase consumer engagement in managing their health and wellness.

The Geisinger Health System in Pennsylvania is considered an integration pioneer, operating on a "hub and spoke" model of 250 primary care physicians located within community (i.e., the "spokes") and 450 specialists located in major hospital "hubs" which streamlines communication between acute and primary care providers. Geisinger provides for round-the-clock primary and specialist care, nurse care coordinators, virtual care-management support, home-based monitoring and a 'personal care navigator' to respond to inquiries and manage care in the community.[77] Performance improvement efforts remain ongoing for all parts of the system; however, there is little empirical evidence of health system outcomes of this model.[78]

Similarly, the State of Vermont has implemented their Integrated Health Services (IHS) model supported by multidisciplinary Community Health Teams (CHTs) which engage health consumers and supplement the care typically offered in physician practices with nutrition counselling, health and wellness coaching, mental health services, home visits, and social service referrals. Coordination of community-based care support has used electronic health records, electronic prescribing, patient tracking and registry function to support the integrated approach to care in this

model.[79,80] The effectiveness of this model has been documented in one pilot site (since July 2008) and reports a 33.8 per cent decrease in the rate of change for emergency department visits, a 23.9 per cent decrease in the rate of change for inpatient admissions, a 8.9 per cent decrease in utilization from 2008 to 2009 and a 11.6 per cent decrease in cost from 2008 to 2009.[81]

In 1998, Intermountain Healthcare began the implementation of their Mental Health Integration quality improvement program that assesses patients in primary care practices for physical ailments and levels of mental health risk. Based on the complexity and severity of the mental health concerns, providers are trained to consult with patients and with the support of a Mental Health Integration team.[82] Using their electronic medical records system and mental health registries, Intermountain's evaluation teams are able to track detection, patient functional improvement and satisfaction over time. Studies have shown that patients, treated in Intermountain's practices show improved satisfaction and overall less use of primary care, emergency room and inpatient psychiatric facilities.[82] Physicians also report greater confidence in their abilities to identify and manage mental health problems. Key to the program's success has been the involvement and support from consumer groups such as the National Alliance for Mental Illness.

Massachusetts General Hospital has created a similar model for patient-centric primary care through the use of remote physiologic monitoring and recording of vital signs, patient portals to support patient data capture, communication and education, virtual outreach and consulting, on-site and remote scheduling, and electronic patient check-in.[83] The model is focused on collaboration between caregivers, electronic communication with patients, flexible open-access scheduling, building relationships with patients, and educating and connecting with patients

via in-office and remote/virtual consultations.[83,84] Outcomes have yet to be reported on the use of this model and its impact on health systems.

Chronic Illness Management

Most applications of IT intended to facilitate patient self-management have been implemented as pilot studies and demonstration projects in the U.S. For instance, the Diabetes Connected Health (DCH) application is a remote blood glucose monitoring application which consists of a website that is designed to enhance the flow of information and collaboration between patients and providers and also to allow for patients to upload glucometer readings from commercially available glucometers. The glucometer readings are stored and graphically presented by the application so that the trends of the readings can be viewed and discussed between patients and health providers. The website also allows patients to add comments to each reading (e.g. foods eaten). Providers use the site to familiarize themselves with a patient's trends and overall habits, to send comments based on their assessment of the trends, and to recommend treatments without patients needing to make clinical visits. Patients can adjust their habits based on their results and the provider's feedback. Results of trials have shown that patients were more motivated knowing that providers were monitoring their results or even just acknowledging their efforts in managing their disease. Patients also reported increased awareness of their blood sugar levels and a better understanding of the effects of dietary intake on blood sugar, thus helping patients to be more successful in self-management.[85] The application is part of a larger Connected Health Care Suite which also includes applications for enabling self-management of other chronic conditions such as hypertension.

Summary

The focus of innovation in the U.S. is on the use of technology to integrate care from hospitals to communities and to streamline

communication and access to information for patients and families. The heavy reliance on technology is a consistent and dominant theme in the U.S. health care system. The issue of having a large sector of their population without access to health care services has not been a major focus of innovation efforts in the U.S. Innovation efforts focused on integration of care services and the use of IT to engage consumers and streamline health services has offered little relief to the challenge of uninsured Americans with no access to health care; however, there is preliminary evidence that integration of care has achieved decreased demands on resource intensive acute care services.

Canada

Canada's health care system is implemented and managed by the individual provinces and territories. This distributed model of health systems is associated with a lack of consolidated national-level strategies for the organization and delivery of health care services. All health systems must ascribe to the principals of the Canada Health Act which guarantees public administration, comprehensiveness, universality, portability and accessibility. It is considered one of the three "State as Owner-Operator" national health systems among the comparator countries and is the only one that does not allow private practice for physicians offering health services that are within the publicly funded services managed by the province.

Innovation

Innovation as a strategy for health system reform in Canada ranks among the lowest of the comparator countries in this analysis.[86,87] Thus, evidence of innovation and its impact on health systems is very limited. Generally, innovation is focused on two strategies: strengthening primary care and managing access to care with the use of telehealth

technology. Within the primary care innovation space, there is emerging evidence, although limited to one province, of a shift in health resources towards chronic illness management.

Strengthening Primary Care

Primary care innovation is emerging in three Canadian provinces: Ontario, Quebec and Alberta. In the two most densely populated provinces (Ontario and Quebec) innovative models of primary care have been implemented to support integration of care and strengthen primary health care more broadly. Since 2002, the Health Ministry of Québec has been implementing the Family Medicine Group model[88] as a way to strengthen primary care in the province. These family medicine groups consist of six to 12 physicians supported by nurses and nurse practitioners and in some cases nutritionists, mental health professionals and other allied health professionals. The groups take care of large patient populations of 1000 to 2200 patients per physician.[88] The implementation of the family medicine group model was intended to provide a first point of contact; improve access and continuity with family physicians for patients with chronic and complex care needs; provide for extended hours on nights, weekends and holidays when doctors can be seen on a walk-in basis; improve service continuity for registered patients; ensure better monitoring of patients; and help to link patients with other service providers (e.g. social services and long-term care).[88] Nurses play important roles in patient screening and education processes and in prevention and health promotion.[89]

Similarly, Ontario has implemented the Family Health Team (FHT) model to strengthen primary care services by improving access, encouraging continuity of care, and increased preventative care and health promotion.[90] FHTs enhance access by providing evening and weekend clinics, after-hours on-call care, and establishing same day appointment systems.[90] The FHT model encourages continuity of care as patients

select and register formally with a family health team. Financial incentives in the form of bonuses encourage FHTs to provide preventative services such as immunizations and cancer screening.[90]

Similar to Quebec and Ontario, Alberta has moved towards strengthening the role of primary care in its health system. Alberta has focused on chronic disease management programs as a way to move the health system away from acute, episodic care towards a proactive and multidisciplinary care approach. Alberta's program commenced with funding from Alberta Health and Wellness with an objective to build capacity in the health system for chronic disease management. The program is built around an 'expanded chronic care model' and places emphasis on developing structured care plans as a way to achieve quality outcomes. Patient pathways and workflow are carefully planned and mapped out and service agreements are used to define care roles and responsibilities for primary care physicians, members of multidisciplinary care teams, and patients and their families. Patient self-management is an important part of the program and health professionals are provided with the training and tools they require to support self-management. There is emerging evidence of the program's success in Calgary with a 41 per cent decrease in hospital admissions and a 34 per cent decrease in emergency department visits between baseline and one-year followup.[91]

The impact of these new models of primary care is not well documented. Challenges faced by both Quebec and Ontario include a slow uptake by physicians and its dominant fee-for-service payment scheme (in the Quebec approach) which presents barriers for provision of services such as case management and care coordination. Other problems mimic those in Ontario's FHT model such as the difficulty of developing true interdisciplinary team work. Pomey et al (2009)[89] describe the model as a compromise between innovation to reform front line care while at the same time respecting the professional autonomy of physicians. Despite

these limitations, in at least one study,[92] the model has been found to score consistently well on aspects of performance such as accessibility, continuity and responsiveness to vulnerable patients; however, new primary care models in this research did not outperform the traditional solo-practice provider model in many key outcomes for health care quality.

Community Access to Care through Telehealth

Ontario's telemedicine network (OTN)[93] is one of largest in the world with access available from all hospitals and numerous other health care facilities across the province. In addition to providing for clinical care of patients in remote areas of the province, the network aids in providing access to distance education. The network provides for both live, web-based conferencing as well as a store-and-forward service allowing for delayed review of clinical images and data by specialist consultants. Innovative applications of the network include:

- A Tele-Stroke program to provide stroke patients in remote areas with access to expert neurological assessment which facilitated increased regional capacity and resulted in reduced patient transport;[94]
- A pilot Tele-home care program for patients with congestive heart failure and chronic obstructive pulmonary disease COPD, which resulted in large reductions in hospital admissions and emergency room visits;
- A Tele-Psychiatry program that allows clients in remote areas (through referral) to consult with specialist psychiatrists without having to travel;
- A Tele-Pediatrics program that provides support and outreach of children in remote and under-served areas; and

- A TeleDermatology program that is somewhat unique in being able to offer live video conferencing rather than traditional store-and-forward TeleDermatology.

Although the OTN system is mostly based on designated video conferencing end points in hospitals and clinics, currently planned extensions will extend the reach into patient's homes and doctor's offices. An expanded network will provide the foundation for improved home care and remote monitoring. The network was recognized in 2007 by Computerworld for its use of IT to benefit society.[95] The limitation of this innovation program is that it has not been implemented across provincial health systems to offer an integrated approach to providing access to care as a national strategy. There is limited evidence to date that identifies the impact of the use of telehealth on improving health outcomes or increased health system productivity.

Summary

Innovation in Canada has focused largely on primary care reform and the implementation of multidisciplinary teams to provide more comprehensive primary health care to communities. These programs are evident in three of the 10 provinces and focus more on primary health care service delivery rather than chronic disease management services, which is the innovation focus of many European countries. Canada has demonstrated expertise in telehealth as a strategy for managing access to care across the vast geographic land mass of this country, similar to Australia; however, Australia has progressed further in creating an advanced network approach to ensure access to primary care across geographic distances. Canada's innovation strategy to date has been limited in its focus on creating strategies in communities for chronic illness management and very limited attention to actively engaging consumers in managing their own care as has been the case in other comparator countries. Canada continues to subscribe to the "State as

Owner-Operator" of health systems where the consumer is the primary recipient of care and not an active participant and manager of their own health and wellness.

Lessons Learned and Recommendations

This comparative analysis has yielded important insights into the progress of the eight comparator countries in using innovation to leverage health system change to meet the population health demands in each country.

The first lesson learned is that there is very limited empirical evidence of the impact of the innovation approaches at the health system level in any of the countries included in the analysis. Despite a number of very transformative changes in health services in these countries, there was limited evidence of the impact of change and innovation on either population health outcomes or the productivity and efficiency of health systems.

The second "lesson learned" is that no single country has managed to completely transform their health system to achieve sustainability; however, a number of countries have made impressive strides in various areas to improve the quality of care delivered and health outcomes for the population. In every case, health care costs continue to out distance the growth of each country's GDP as each one faces growing demands for health services from aging populations and rising rates of chronic illness.

The remaining lessons learned are best illustrated by the patterns and trends across all of the comparator countries relative to innovation as a strategy for health system transformation. There were five overall themes generated by this analysis: the distinct cultures of health systems; integration of health services across the continuum of care; accountability for health care in communities; the role of consumers in

engaging and managing their own health and wellness; and financial models that drive competition. Each is described below.

Culture of Health Systems. This analysis yielded important insights into the cultures of health systems across the comparator countries. In national health systems (Canada, Australia, the U.K.), the focus of health system innovation was on the redesign of health services primarily to achieve cost savings and efficiencies. In social insurance models of health systems (Germany, France, Switzerland, Netherlands), the innovation focus was on creating new models of care in communities that offered consumers greater access to primary care and incentivized them to manage chronic illness. There was some evidence that by engaging consumers in managing their own health and wellness that there was reduced need for emergency room visits to hospital and reduced hospital bed occupancy. It is possible that this cultural dimension of health care is a function of the various cultures in each country; however, this variation in innovation approach suggests that national health care systems support more traditional provider-centric models where consumers are the recipients of care, whereas social insurance models view consumers as decision-makers who are actively engaged in managing their own health and wellness. In national health care systems and the U.S. system, there was a tendency to have a dominant focus on acute care services with varying degrees of outreach to communities. In countries with social insurance models of health care, consumers have an active decision-making role in health services. Thus, innovation approaches in these countries have leveraged the power of consumer choice and competition to achieve system redesign that is centered on consumers who are actively engaged in new and different ways to manage their personal health and wellness.

Integration of Health Services across the Continuum of Care. Integration of health services across the continuum of care remains a challenge in every one of the countries in this analysis. In a number of countries, there has been substantial progress towards shifting health care services towards more community-based models of care. Moving towards greater integration of services in the community and strengthening primary health care services that manage chronic illness were the two most compelling innovation trends in this study. This trend towards shifting health care into integrated community care models was most highly developed in the countries with social insurance models such as Netherlands and Germany. In contrast, Australia and Canada have focused more directly on strengthening access to primary health care in rural and remote populations with less focus on improved integration of health services across the continuum of health care.

Accountability for Health Care Services in Communities. In a number of countries, innovation approaches were focused on redesigning health services to provide access to care on a 24/7 basis. The U.K., Australia, France and Netherlands have redesigned primary care accountability structures to mandate and fund primary care physicians to provide health services on a 24/7 basis to all citizens. The outcome of this important innovation appears to be linked to impressive reductions in patient volumes of emergency room visits and specialist care which has resulted in emergency departments no longer being the default primary care setting after regular business hours. There were no similar innovative programs evident in Canada. This innovation in 24/7 accountability is evident in both social insurance based health systems and national health systems alike. In Australia, national networks of GPs provide 24/7 coverage of primary health care services, even in remote and rural communities across a large land mass. In France, a similar national model of Medicins SOS has provided over 4 million health service calls in the home as a result of 24/7 availability for managing primary care in

communities for a number of years. Netherlands has also adopted the 24/7 accountability model for health service delivery after hours. Although there is evidence of innovative programs designed to strengthen community-based care, the trend towards 24/7 accountability of health and wellness of communities was simply not evident in Canada.

Role of Consumers in Engaging in Managing Their Own Health and Wellness. Consumer engagement in health care services is a very consistent finding in every country in this analysis and was a defining feature of innovation in most countries. Countries that strengthened the engagement of consumers in managing their own health and wellness directly were also countries that reported the low wait times for emergency care and the lowest occupancy rates for hospitals. In countries with social insurance models of health care, there is substantial reliance on consumer choice to select health care services accessed through private insurance companies. This active role of consumers drives market competition for health services. Even in universal health systems in the U.K. and Australia, consumers purchase private insurance for specific health services which empower consumers to influence health services driven by competition in the private sector. In Canada, there was little evidence of competition driven by consumer engagement.

Financial Models that Drive Competition. Financial models and financial incentives for change and innovation was the last distinct theme across each of the countries in this analysis. Specifically, the countries that demonstrated a substantial shift towards community-based health services were able to do so as a result of creating financial incentives and new financial models to drive innovation. Financial incentives assumed an important role in incentivizing physician care in communities. Australia incentivizes MD's to practice in remote settings and use telehealth services to manage remote population health needs. Germany

uses incentives for both physicians and consumers to participate in disease management programs in communities, and France incentivizes patients and their GPs to develop care plans to ensure they are freed from co-payments. Both Netherlands and France have developed specialized financial models for primary care physicians to provide 24/7 accountability for population health in communities. Indirectly, financial incentives may also play an important role in social insurance models whereby the market competition for consumers drives new service deliver models that are attractive and desirable for consumers. In the U.S., the primary competitive strategy to attract health consumers was the availability of high technology and advanced specialist care, most often associated with acute care services.

Recommendations for Canada

The comparative study of the countries profiled in this analysis revealed a number of important overall themes: the distinct cultures of health systems; integration of health services across the continuum of care; accountability for health care services in communities; the role of consumers in engaging in the management of their own health and wellness; and financial models that drive competition.

The lessons learned from the successes in the comparator countries serve as a foundation for three key recommendations for the Canadian health care system. These recommendations are intended to be a catalyst for dialogue among health system leaders, consumers, health professionals and key stakeholders in the health sector as a basis for achieving advancements in innovation adoption in the Canadian health care system.

Recommendation 1:

Create a new, consumer driven culture in Canada's health care system. Transform the current, traditional, highly "prescriptive" approach to health care to one that places consumers at the centre of service delivery models. Foster a culture that shifts the balance of power from the health provider to the consumer, whereby consumers take charge of managing their own health and wellness and health professionals assume a supportive role of coach and mentor. In this emergent culture, health providers focus on creating the environment and conditions for consumers to thrive, to be empowered and to drive health system transformation. Key strategies to achieve this cultural shift are:

- Redesign health service environments to create consumer choice. Engage consumers directly in the choice of providers and selecting health services that meet their personal health and wellness goals. Create financial incentives using insurance programs or personal health budgets that empower consumer decision-making to drive competition and innovation among health system stakeholders.
- Educate and train the next generation of health professionals as expert coaches and mentors who use entrepreneurial thinking and leadership to drive change and innovation adoption to transform health care environments.
- Focus innovation on leveraging information technologies and systems to improve health literacy in the Canadian population, as a basis for empowering consumers to set priorities in managing their personal health and wellness, which will stimulate improvements in quality and safety of health services.

Recommendation 2:

Transform Canada's health systems from a dominant acute care focus to a community-based system focused on chronic illness management and prevention. Implement accountability and financial incentives driven by population health outcomes. Global health systems that have been able to shift health care services to chronic illness management in communities have been able to demonstrate substantial improvements in reducing the reliance on acute care services to manage chronic illness exacerbations, particularly among the elderly.

Specific strategies to advance community-based chronic illness management are:

- Create accountability systems whereby health providers, and physicians in particular, assume 24/7 accountability for managing the health and wellness in communities.
- Create new community-based models of service delivery and remuneration that support a coordinated and integrated approach to chronic illness management across the continuum of care in a seamless system of care delivery.
- Create financial incentives within the health system that reward and motivate health professionals to achieve population health outcomes that reflect high quality evidence-based care.

Recommendation 3:

Create a national strategy for health system innovation based on best evidence that is empirically driven and captures the impact of innovation across the continuum of care. Build the evidence for innovation adoption that achieves consumer engagement within collaborative health care environments, in a coordinated and integrated approach to health and wellness. Evidence-based innovation would be characterized by dynamic knowledge translation models across provincial and territorial jurisdictions to support learning about innovation outcomes to build momentum to drive Canada's health system innovation agenda. To move towards a national strategy for health innovation, Canada should:

- Develop a coordinated approach to proof of concept testing of new innovations with empirical measures of system level impact and evidence of knowledge transfer and exchange.
- Develop a performance management system within health systems that examines and captures the impact of knowledge translation of innovations on both system performance and population health across the continuum of care.
- Create the empirical evidence for implementation of new health services to achieve quality standards of care as well as national and strategic goals for a sustainable health care system.

Concluding Remarks

The health systems of comparator OECD countries provide a rich platform for dialogue and innovation in Canada. Leveraging the power of consumer choice, which drives competition for health system actors to redesign and transform services to actively engage consumers in managing their personal health and wellness, will offer transformational change for the culture of health care systems in Canada. Shifting health system priorities towards strengthening communities to develop primary care models that include comprehensive programs of chronic illness management will be an essential step towards meeting the current and future population health needs of Canadians. Leveraging innovation to achieve sustainable health care systems that deliver high quality health services paves the way forward for maintaining and improving health outcomes and quality of life for all Canadians.

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