Moving Towards Activity-Based Financing: Interjurisdictional Experience and Outlook for Quebec

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Introduction

Canadian provincial governments continue to find ways to address the growing demands of their health care systems. Nevertheless, those responsible for the funding and management of health care systems have the increasingly difficult task of meeting the growing demand for services with finite means. Within health care system management, organizational objectives can be achieved through the use of financial incentivizing strategies. Activity based financing (ABF) is one of the tools that seeks to optimize the allocation of available government funds to serve the population along various health ministries' mandates by directly compensating and incentivizing providers while supporting them to improve the appropriateness, quality and efficiency of patient care.

The main rational for moving to an activity based funding system is the establishment of a transparent link between funding and activity and align incentives across the health care sector. For many jurisdictions including Quebec this link tends to be obscured especially where global budgets are the main mechanism for hospital reimbursement. The move towards ABF represents the first in a series of shifts towards a health care model of funding better designed to achieve objectively measurable targets while promoting the most equitable and practical use of limited resources and funds.

Economic theory stipulates that by reimbursing hospitals on the basis of a fixed rate per activity, adjusted for complexity, ABF should provide financial incentives to increase activity that is lacking under global budgeting. When compared to a fee-for-service model, ABF would also improve efficiency (Monrad Aas 1995; Newhouse 1996; Jegers, Kesteloot et al. 2002). If left unchecked however pure ABF could have adverse effects including patient selection (i.e., creaming), inappropriate treatment (i.e., dumping),quality skimping (Monrad Aas 1995; Ellis 1998; Jegers, Kesteloot et al. 2002) and unnecessary treatment (Mannion, Marini et al. 2008).

What seems clear is that there is no universal ABF model that will work in every setting. The application of ABF models appear to be highly customized. As such, it is not possible to provide broad endorsement or rejection of any specific model.

The main propose of this document is to outline the **motivations for and implementation of activity based funding systems in various jurisdictions** while offering guidance in the context of Quebec. There will be only a limited discussion of the impacts of the ABF reimbursement mechanisms in this document because empirical evaluations are still rather scarce.

Existing funding models

Mechanisms for the payment of health care institutions and providers have evolved over time to meet changing needs. Broadly speaking institutions can be funded by global budgeting, line-by-line budgeting or by activity, whereas physicians can be paid by fee-for-service mechanisms or time-based payment systems.

Without elaborating the merits and drawbacks of each mechanism listed above, it is safe to say that regardless of the mechanism each funding system brings its own sets of desired and perverse incentives (Robinson 2001). The situation is even further complicated when multiple funding models are used at the same time and when financial incentives between sectors are not aligned. An example is Quebec hospitals are funded through historic global budgets and the majority of the provinces' physicians are paid through fee-for-service; generally speaking global budgets give hospitals the incentive to limit the volume of cases, while fee-for-service gives physicians an incentive to increase volumes.

The results of this conflict of interest impact patient care. A number of Canadian and US studies suggest that health care systems do not routinely provide safe high-quality care, which harms patients and drives up costs (The Institue of Medicine 2001; Baker, Norton et al. 2004). By aligning institutional and physician payments incentives, this among other things, rewards high-quality care, may be a critical step in tackling the issue.

Several Quebec hospitals including the JGH and the MUHC (to begin winter 2013) have recently implemented a safety and quality improvement initiative, drawn upon guidelines provided by the Canadian Patient Safety Institute (CPSI) and the U.S.-based Institute for Healthcare Improvement. This represents a good start, especially since the incidence of bed sores has decreased from 25 % to 6% where the Canadian national average is 26 % (Jewish General Hospital 2012). However, province-wide publicly reported standardized patient safety and quality indicators are lacking, making it difficult to assess the success of many of these initiatives.

Quebec has explored the use of financial incentives to achieve improvements in process and access. Incentives for GPs to follow at risk or chronically ill patients and supplemental "activity-based" payment for various types of surgery are two examples. However, data quality issues do not allow policy maker to effectively gauge the outcomes.

Activity-based funding models

The Canadian Medical Association coined the term "patient-focused funding" (PFF) to describe hospital funding that is activity based and built on a predetermined complexity weighted fee (Canadian Medical Association 2007). The CMA argues that this approach allows the funding to follow the patient. Pay-for-performance (P4P) and ABF are both best understood as subtypes of PFF: P4P directly links a provider's performance to their compensation; whereas ABF directly links hospital's income to the number of case mix patients treated.

P4P compensates providers on the basis of their performance against quality and/or efficiency benchmarks. Quality care be assessed in five areas: access, structure, process, outcomes and patient experience: where *access to care* is the patient's attainment of timely and appropriate health care; *structure of care* is a feature of a health care organization or clinician relevant to the provision of health care; *process of care* is a health care service provided to or on behalf of a patient; outcome of care is the health state of a patient resulting from health care; and *experience of care* is the individual's or population's report concerning healthcare (Petersen, Woodard et al. 2006).

Although only a few performance measures address the overuse of services, measures of resource use that identify inefficient providers are beginning to come into use and become validated (Schneider, Hussey et al. 2010).

P4P programmes vary according to funders' and providers' objectives. For example, some programmes reward providers for meeting quality benchmarks, while others focus on payments on non-clinical tasks that are normally uncompensated but benefit the patient. P4P programmes can also vary according to payment strategy. For example, incentives can be targeted at a subset of providers (i.e., top 15 %) or expanded to any provider that meets a targeted objective (Werner and Dudley 2009; Wranik and Durier-Copp 2011).

ABF, also referred to as volume-based funding, service-based funding, case-mix funding and payment-by-results in the UK, directly link hospital's income to the number and case-mix of patients treated. Implementing ABF requires that the hospital and funder first divide the hospital services delivered to individual patients into comparable groups (e.g., all heart attack patients), and then assign a price for eac h of these groups (e.g., a fixed sum paid to hospitals for a set of heart attack patients, regardless of actual costs to the hospital). In most cases, the grouping is based on diagnosis-related groups (DRGs; see annex 1), which identify a number of case types that are expected to draw on a similar amount of hospital services (Canadian Health Services Research Foundation 2009).

ABF primarily aims to increase efficiency and activity volumes, shifting away from hospital global budgets toward a model where hospitals are reimbursed based on patient diagnoses and the type of services or procedures performed. The goal is to overcome some of the shortcomings of the global budget system which see patients as a cost rather than a source of revenue.

Under an ABF regime, when offered a fixed payment for a patient with a particular condition, the hospital has an incentive to identify the total costs of treating that patient and then to reduce those costs to below the fixed payment. If the hospital can do this, it realizes the savings; if not, it bears the additional costs.

Not all activity-based funding programs are the same, and they may differ in strategy. For example, in a "pure" activity-based funding program, hospital revenue is determined by multiplying activity in each DRG by the fixed price; mixed activity-based funding programs and contract-and-volume contracts vary the payments by accounting for non-clinical activities or by defining target levels of activity (Street 2007).

One of the strongest calls for activity-based funding in Canada came from the 2002 Kirby report (Standing Senate Committee on Social Afairs Science and Technology 2002). The report suggested that activity-based funding would provide better information with which to cost services and measure performance, and therefore greater transparency and accountability. The report also argued that activity-based funding would result in a more equitable distribution of funds, increased efficiency and performance, competition between hospitals to provide the best services, increased responsiveness to patients' needs by providers, and flexibility in changing priorities.

Critics point to several disadvantages of ABF, including the complexity of developing costing data and appropriate fees (see annex 1). Under global budgeting and its variants, hospitals have no incentive to measure case-related costs. This data is currently limited in Canada, and in order for ABF to be implemented, it would have to be developed. Other disadvantages include the potential to focus on procedure-driven health care rather than comprehensive integrated care; quality of care compromised by "gaming" behaviour (e.g., fraudulently placing patients in more lucrative payment categories, early discharge, patient selection); uncontrolled global expenditures; and the difficulty of implementing the model for rural/remote and teaching hospitals (Association of Canadian Academic Healthcare Organizations 2002; Canadian Healthcare Association 2002; Collier 2008). However, advocates believe many of these shortcomings can be addressed through careful design and more nuanced development of activity-based funding programs.

Experiences with ABF

In the past ten years, many jurisdictions have used ABF to attain their goals of cost effective quality improvement of their health care sector. Seldom introduced alone, ABF is one mechanism amongst a host of parallel strategies: such as public reporting; broad spectrum IT implementation; and wait times targeting. In theory Quebec has already implemented ABF as part of a surgical wait time reduction strategy, but the ability to quantify reductions in wait time and improvement in overall efficiency has evaded analysis.

The following is intended to be a short summary of Canadian and international ABF experiences with an emphasis on the European situation as it is most similar to the Quebec context and offers guidance. While there are some similarities across counties in why ABF was adopted, clear and significant differences are evident in how the funding system has been adapted and implemented.

Alberta

ABF funding for long-term care began in April 2010, with the Resident Assessment Instrument being used to determine clinically meaningful patient groups in terms of their expected resource uses. Depending on the results of the ABF in long-term care, Alberta plans to roll-out ABF into first mental health then assisted living, in-patient hospital care and emergency medical services (Alberta Health and Wellness 2009; Alberta Health Services 2011).

Alberta identified inpatient care, outpatient care, emergency care and nursing homes as groups of activities to be transitioned to ABF. It was felt however that hospitals with their broad range of activities

which need to be incorporated under ABF would be too complex a starting point. When compared to nursing homes, hospitals need to identify and fund appropriately a wide heterogeneous range of products including inpatients, outpatients, research and teaching (Duckett 2010). Based on research from the University of Michigan's Institute of Gerontology, a method was developed to cluster clinically meaningful activities into 30 homogenous groups of long term care residents in terms of expected resource consumption. This approach allows nursing homes to be paid on the basis of activity or more precisely their residents' acuity.

British Colombia

A province-wide PFF model coupled with an additional funding of $250 million over two years was launched in April 2010. The objective of the PFF model is to reduce wait times and increase same-day surgical procedures. The model will pay 23 hospitals a set, competitive price for acute care services, with case-mix groups and resource intensity weights used to determine case fees for hospital services. Overseen by the newly established BC Health Services Purchasing Organization, PFF will be expanded gradually, with approximately 20% of eligible acute-care spending funded through PFF by 2012-13.

A P4P program has been piloted, and is also expected to be implemented in 12 hospitals across BC, to decongest emergency departments. Hospitals could receive an extra $100 to $600 per patient if they are treated or admitted within set time limits (BC Patient Safety and Quality Council 2008).

Under the Full Service Family Practice Incentive Program, GPs are eligible to receive bonuses for providing care in accordance with the BC Clinical Guidelines for patients with diabetes, hypertension, congestive heart failure, and chronic obstructive pulmonary disease. Other incentives have been made available for maternity care, cardiovascular prevention, complex care management, and mental health planning.

Europe (England, Finland, France, Germany and Ireland)

In England, France and Germany the operation of ABF follows a more conventional model than either Finland or Ireland, in that prices are fixed *ex ante*. In Finland, the system is used to determine prices principally for the purposes of hospital billing, although these prices may be subject to change *ex post* to ensure the allocation of adequate funding to hospitals. In Ireland, ABF payment is used to adjust hospital budgets for workload complexity and relative performance (O'Reilly, McCarthy et al. 2011).

Since its introduction the scope of ABF has expanded in Ireland threefold in the number of participating hospitals(O'Reilly, McCarthy et al. 2011). In Finland, the move away from the incumbent system of *per diem* prices towards case-based payments followed in 1993, reforms under which state subsidies for health care were paid to municipalities who then financed hospital care for their residents (Mikkola 2002; Mikkola and Häkkinen 2002). In 1997 the first of 21 districts adopted DRGs as a case-based payment method (Mikkola and Häkkinen 2002). Today 13 of 21 are using DRG-based pricing (Häkkinen 2010).

In England, France and Germany, ABF was introduced at a national level over a number of years during the 2000s. Even as block contracts worked to contain costs in England, they were abandoned in favour

of ABF; a mechanism that proved more consistent with the prevailing political commitment to wait time reduction, increased patient choice and encouragement of competition (Street and Maynard 2007). Since the early-1990s DRGs have been promoted in France for measuring hospital activity. Initially to gain physician buy-in DRGs were presented as an epidemiological tool for monitoring patients (Kimberly, de Pouvourville et al. 2008). The discourse has however changed and ABF payment using DRGs came to be seen as a good alternative to global budgets, the precursor to ABF for funding of public hospitals, which were considered deficient because they did not reflect the costs and volumes of services provided (Bellanger and Tardif 2006). The introduction of a payment scheme based on activity was seen as a way of stimulating completion between public and private providers, creating, in theory, a level playing field (Or 2009). In Germany, ABF replaced a mixed system of per case and *per diem* payments, limited by hospital budgets, which may have prolonged length of stay beyond what is medically necessary (Lungen and Lapsley 2003). Therefore, despite the existence of differing payment mechanisms, all five countries have chosen to implement reimbursement reforms and move to a form of ABF within about ten years (see annex II).

The introduction of ABF was generally phased over several years, allowing hospitals and funders time to adjust to the new reimbursement mechanism, minimizing risk of system destabilization. What differed between countries was the length of time for implementation and methods of adjustment. Initially, ABF was limited to certain hospitals (England) and/or a subset of hospital activity (England, France), with initial losses, relative to previous reimbursement, limited (Germany). Moreover, in all countries' reimbursement rates were partially determined by a hospitals' own costs (Busse, Geissler et al. 2011). Overtime these countries moved away from hospital-specific reimbursement rates. In France for example, 2012 will be the last year where national DRG prices will be adjusted for each provider's historic costs. This idea is consisted with Shleifer's theory of yardstick competition, which stipulates that potential efficiency gains are maximized when reimbursement rates are entirely independent of hospitals' costs (Shleifer 1985).

Despite variations in the implementation of ABF there were some common policy objectives that these different systems are designd to achieve (see annex III). In England for example improving efficiency was a top priority whereas in France where private hospitals deliver the majority of surgeries there was no wait time problems there was a need for increased transparency and funding equity between public and private providers. Many of the policy objectives chosen were mutually re-enforcing; increasing activity will reduce wait times. However, attention must be paid to potentially conflicting objectives; increasing efficiency by lowering costs could promote lower quality care delivery, for example.

The European experience has demonstrated that ABF alone cannot enable the achievement of all the objectives. Indeed policy makers require other tools and an understanding of the policy landscape to predict what other policy may influence outlined objectives, making it difficult to ascribe systemic change to ABF alone.

There are variations in implementation and development of an ABF mechanism. The three main components are: the types of activity covered; the cost-accounting methodology followed; and the re-imbursement rate methodology.

In England, France and Germany hospital ABF participation was mandatory, with the exception of some specialized centres (Ettelt and Nolte 2010). This was done because full hospital participation minimises the potential for cost shifting to other institutions within the acute care sector, because hospitals might try to lower their costs by transferring patients to other parts of the health care system not subject to ABF. Not all Irish public hospital participated initially in ABF, though the roll-out is progressing (Brick, Nolan et al. 2010). Initially participating hospitals were larger than those that didn't but today 92 % of acute activity is covered (Health Service Executive 2010). Finland's decentralized health care system varies its DRG-based pricing system by hospital district (Häkkinen 2010). Without national guidance on the operations of an ABF system, it results in significant variation across districts in terms of system design and implementation at the cost of diminished transparency and comparability (Häkkinen 2005).

All five counties use ABF to fund all day-case and acute impatient activity (Busse, Geissler et al. 2011). Mental health reimbursement is the notable exception in terms of ABF funding due to issues related to diagnosis and heterogeneous patient costs (Ettelt, Thomson et al. 2006). However plans to introduce mental health ABF are on the drawing board in England and France and are scheduled to begin in Germany in 2013. Teaching and research activities are typically funded separate to ABF and therefore not reflected in the price.

Outpatient ABF is found in three of the five above countries: In Germany there exists strict organisational division between the provision of inpatient and outpatient services, prohibiting the extension of ABF to outpatient activity (Busse and Riesberg 2004);in France outpatient services provided in hospital are paid by fee-for-service.

All of these countries classify their inpatient activity using local adaptations to the US DRG system. Modifications were made to secure clinical ownership and local acceptance of the system. There is substantial variability in the number of groups across different countries' scheme; France for example has three times the number of Ireland. There exists however no evidence for the optimum number of groups and no clear disadvantages related to those schemes that have more or less groups (O'Reilly, Busse et al. 2012).

As with activity data, the five countries have different ways of calculating costs. Germany and Finland use a bottom-up approach that is based on patient-level data on resource utilisation to which unit cost data are applied (Street 2007). This method is considered accurate as it is based on actually not averaged resource use. When patient-level data does not exist, as in England, France and Ireland, a top-down approach has been used. This involves the allocation of relevant hospital expenditure to particular services and specialties(Street 2007). England and Ireland are both moving towards the collection and use of patient-level information.

Cost data can be supplied by a sample hospital - Finland, France and Germany – or by the full hospital participation in ABF as in Ireland. A sample-based approach should ensure good quality data at the lowest cost providing that hospitals all follow a similar format for reporting. France and Germany incentivise the supply of high-quality data in the required format (Schreyögg, Stargardt et al. 2006). Samples however may not be representative (Schreyögg, Tiemann et al. 2006): the German's sample is

biased towards medium and large hospitals, with low participation by both public and private hospitals (sc 2006b); and the French have low participation from the private sector (Schreyögg, Stargardt et al. 2006). Achieving full participation is thought to be dependent on hospital ownership and the ability of the price-setting body to gain access to cost data (Schreyögg, Stargardt et al. 2006). Therefore, obtaining data on all hospitals is easier in Ireland where all hospitals are either owner or funded by the agency responsible for payment rates (Schreyögg, Stargardt et al. 2006). England uses cost data generated from NHS hospitals only; private hospitals need not supply data, even when ABF funding applies to their NHS insured patients.

Capital cost financing mechanisms differ across the five countries as well. Germany and Ireland both excluded capital costs from ABF allowing local, state and/or federal governments to control capital expenditures. That hospitals should be able to control their costs subject to ABF is argument for short-term exclusion of capital costs from ABF (Schreyögg, Stargardt et al. 2006). In France and England however capital costs are, in theory, included in reimbursements. This is supplemented in France but non-transparent direct payments to public hospitals to support the required changes of health care reform (Or and Bellanger 2011).

Prices are set nationally for England, France and Ireland. Germany sees its tariffs determined that state rates will be set independently but converge to a range of +2.5 % to -1.5 % by 2014 and 2015 will see a decision being made on a unified national rate (Ettelt and Nolte 2010). With its totally decentralized system, Finland has prices set for each hospital district. However, even in jurisdictions where prices are set nationally, local modifiers can be applied: England's Market Forces Factor allows for local variation in input prices for example (Street and Maynard 2007).

In all five countries average costs are used for price setting. This is deleterious for several reasons including:

- Rewarding hospitals at full average cost for activity provides an incentive to increase activity as long as marginal cost is less than or equal to the price and/or average cost
- The association between price and average cost encourages convergence to the mean rather than improvement of performance (Street and Maynard 2007). England imposes a 3.5 % reduction of tariffs across all hospitals to ensure results (Busse, Geissler et al. 2011).
- Cost-based prices do not reflect output value, resulting in a suboptimal production of outputs from a social welfare perspective (Smith and Street 2005).

In recognition of ABF's limitations for certain types of activities and cases, all counties have price adjustment mechanisms. Though prices are set in advance a facility to finance outliers exists on a *per diem* basis, rendering the system a mixed-prospective, risk being shared between funders and providers. In England, "top-up" is used to finance complex cases and specialized services (Daidone and Street 2011).

Moreover, certain drugs and medical devices are not included in ABF of four of the five countries, Finland is the exception, but paid in addition to the tariff (Häkkinen 2010). This is a major area for concern as in France for example, expenditure in this area has outpaced growth in ABF (Or 2009). This

trend may be symptomatic of ABF's inadequacies in the reimbursement of complex procedures and/or cost-intensive services. They also may represent hospital management attempt at cost-shifting.

The five counties adopted different methods to control costs and limit the ability of hospitals to increase activity above a financially unsustainable level for the system. England, Germany and Ireland use volume of service contracts at the local level agreed upon between funders and providers (Mannion, Marini et al. 2008). In Germany prices are diminished if services provided exceed the volume contract (Busse and Riesberg 2004). Hospitals therefore have an incentive to maintain a given service level. This same strategy is also used in France but here if hospital expenditure exceeds a national target level, then all hospitals, despite their performance, will face lowered reimbursements. This mechanism has been thought to create instability in hospital finance risk modeling because of uncertainty regarding pricing (Or 2009). In England this type of policy applies only to emergency activity (Busse, Geissler et al. 2011).

In Finland municipalities and hospital districts negotiate the volume and cost of service, with an appointed Council determining prices. Municipalities must cover hospital budgetary deficits, limiting the incentive for hospitals to remain in budget, but the municipality must maintain a balanced budget overall, incentivising overall cost-sharing. Though no reasons have been formally given, Finnish hospitals are more efficient than their Nordic peers (Linna, Häkkinen et al. 2010); it is possible that Finnish municipalities are better at controlling costs (Häkkinen 2010).

Ontario

A funding formula based on case-mix groups and resource intensity weights has been used to distribute nearly $1 billion in incremental funding to Ontario hospitals since 2001. A version of activity-based funding is used by the Ontario government to increase hospital activity in the priority areas defined by the 2004 First Ministers' Accord. Legislation introduced in May 2010 strengthens hospital accountability through several measures, including linking hospital executive compensation to performance. The Ontario government plans to implement activity-based funding for larger hospitals beginning in April 2011 (Canadian Agency for Drugs and Technologies in Health 2012).

Community-based physicians are eligible for a bonus incentive for caring for diabetic and psychiatric patients, and a separate bonus will be paid to physicians who enrol their diabetic patients in the Diabetes Registry. In addition, physicians receive Cumulative Preventive Care Bonuses for achieving specified thresholds of preventive care for their patients in five areas: influenza vaccine, Pap smear, mammography, childhood immunization, and colorectal cancer screening (Ministry of Health and Long-Term Care 2009).

USA

Public and private insurers have implemented over 140 pay-for-performance programs in the US. The majority target primary care physicians, but programs targeting hospitals and other institutions are increasing. The diagnosis-related groups (DRG) system has been used to pay for Medicare patients in hospitals since1983. More recently, the Centers for Medicare and Medicaid Services have experimented with various pay-for-performance programs targeted to physicians' offices, ambulatory care facilities,

hospitals, nursing homes, home health care agencies, and dialysis facilities, and in 2008 stopped reimbursement for preventable complications incurred to Medicare hospital patients after admission.

Impact of ABF

Research on the impact of ABF on hospital resource use, quality of care, LOS and most other metrics is limited (Moreno-Serra and Wagstaff 2010). Moreover, the literature that does exist is extremely limited in its applicability with most studies focusing on the U.S. and ABF's impact on hospital costs. The impact of ABF on other counties and health outcomes is scarce.

Despite the lack of research, international and Canadian experience suggests that ABF introduction increases activity (Kjerstad 2003; Street 2007). The OECD indicated that ABF can increase service supply but needs to be correctly structured to avoid perverse outcome (Hurst and Siciliani 2003). Moreover, productivity gains tend to be temporary (Mikkola 2002).

A common ABF objective is to improve hospital efficiency by some mix of increasing activity, reducing costs and introducing competition between hospitals. No study of the explicit impact on efficiency *per se* has been conducted. However, some studies have reported changes in indicators of efficiency such as average LOS and lowers total input per case (Gerdtham, Rehnberg et al. 1999; Farrar, Yi et al. 2009; Scheller-Kreinsen, Geissler et al. 2009). However ABF is linked to an increased number of cases , growing total expenditure, though at diminished rates (Moreno-Serra and Wagstaff 2010).

Evidence on the effects of ABF on health outcome and quality of care is also limited (Scheller-Kreinsen, Geissler et al. 2009). Early studies demonstrated that ABF did not increase mortality or re-admission rates (Davis and Rhodes 1988). More current research demonstrates either slight or no effect on outcome or quality of care (Carter, Newhouse et al. 1990; Dafny 2003; Moreno-Serra and Wagstaff 2010). Reasons for the limited evidence include:

- Recent introduction of ABF, may be too soon to assess impact;
- ABF is not implemented in a controlled environment, difficult to isolate its effects from other concomitant policies;
- ABF's potential for any specific country depends on their starting point in terms of previous re-imbursement mechanism, programme design and system governance (Street, O'Reilly et al. 2011).

See annex IV summary of studies of changes in activity, LOS, cost and quality following introduction of ABF

Outlook for Quebec

The limited knowledge base and narrow range of ABF studies cautions against drawing any premature conclusions about ABF's ability to improve cost-effectiveness, quality of care, access and other health metrics. The "business case" for ABF, its ROI, is hard to establish, though some studies have made links (Curtin, Beckman et al. 2006). Critics will point to ABF's unintended consequence as a major fault, but

issues such as “gaming” (Carter, Newhouse et al. 1990) and “multitasking” (Campbell, Reeves et al. 2007) have been studied and can be controlled for.

ABF's structure and design will vary its impact

Design of ABF mechanisms differ across jurisdictions. Incentives depend mainly on the policy objectives of the funder, the distribution of performance amongst providers and their performance. Poorly designed incentives will produce a poorly performing ABF system, creating unintended consequences.

Determining how ABF prices are set will largely influence the service level scope achieved. As the European examples demonstrated, when prices reflect hospitals’ average cost they do not necessarily produce cost savings. Therefore, ABF prices must be set to encourage efficient hospital operations management practices notably in their care function. ABF prices must also be regulated to change provider behaviour, as done in NHS ERs.

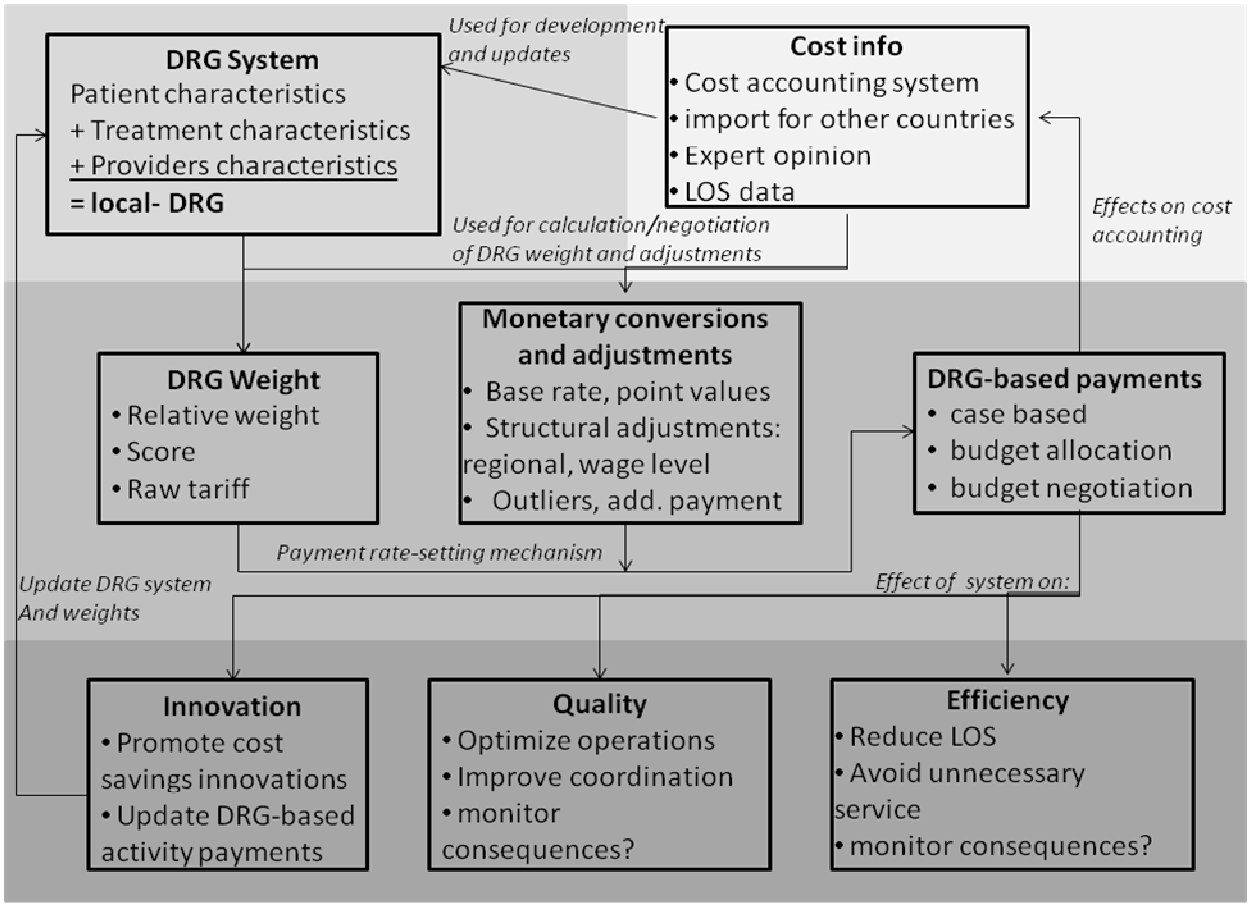
Financial incentives to improve care coordination and cost-effectiveness have not been used to any great extent. As a result, ABF has been criticised for focusing on procedure-driven health care, not paying attention to community based care. In response, funders should unbundle individual activities into several components so different parts of a treatment can be provided in the most cost-effect manner possible. Providers should be rewarded for coordinating care that meets a given standard.

ABF is one step forward in introducing greater accountability to health care

Citizens and different levels of government are demanding increasing levels of accountability for health care expenditures. In an ABF system the provision of information on the different types and costs of services inherent in a DRG-like payment system, will infuse transparency and accountability to hospitals, CSSS and other providers of care.

Annex 1: A framework for DRG implementation

The development of an ABF system is decidedly complex and requires the simultaneous introduction of various systems: DRG-like patient costing systems, hospital cost accounting, DRG weighted payment systems and a monitoring framework. Hospital cost-accounting systems need to be developed along side a local DRG system; the former to understand current costs and the latter price. A prospective system would have to take the following form:



(Busse, Geissler et al. 2011)

Annex II: Timeline and process of introducing ABF in five European Countries

	England	Finland	France	Germany	Ireland
Year of initial introduction of activity-based funding	2003–2004	1997	2004–2005[b]	2003–2004	1993
Process of introducing activity-based funding	Phased in over a four-year period to 2007–2008[a]	Introduced on voluntary basis in some hospital districts	Phased introduction for public hospitals (2004–2008)[c]	Introduced in four stages	Phased introduction for public hospitals
Incumbent reimbursement mechanism	Block budgets and cost and volume contracts	Per case and *per diem* payments	Public and private not-for-profit hospitals: Global budgets private-for-profit hospitals: *Per diem* payments and fee-for-service	Per case and *per diem* payments	Global budget
Characteristics of healthcare system					
Access to hospital services	Universal, free at point of use	Universal	Universal	Universal	Universal, although not necessarily free at point of use
Provision of hospital services	Predominantly public sector	Public and private sectors	Public and private sectors	Public and private sectors	Predominantly public sector
Main source of financing	General taxation	General taxation	Social insurance	Social health insurance	General taxation

(O'Reilly, Busse et al. 2012)

Annex III: Policy objective to be addressed through ABF by jurisdiction

	England	Finland	France	Germany	Ireland
Increase efficiency	✓		✓	✓	✓
Expand activity	✓				
Facilitate patient choice	✓				
Reduce waiting lists	✓				
Improve quality	✓		✓	✓	
Ensure the fair allocation of resources (or funding) across geographical areas, and across and within healthcare sectors		✓	✓	✓	✓
Improve transparency of hospital funding, activity and management	✓		✓	✓	✓
To cover costs of production		✓			
Create a level playing field for payments to public and private hospitals	✓		✓		
Improved documentation of internal processes and increased managerial capacity which would in turn result in improved efficiency and quality				✓	
Establish link between activity and funding	✓	✓			✓

(O'Reilly, Busse et al. 2012)

Annex IV: Summary of studies of changes in activity, length of stay, cost and quality following introduction of activity-based funding

Country	Study	Methodology/ study period	Activity	Length of stay	Cost	Quality of patient care	Quality of data and clinical coding
England	Audit Commission (2008b)	Descriptive/ 2003–2004 to 2006–2007	Increase in inpatient activity (total and activity subject to activity-based funding), day-case activity, and short-stay admissions	Decrease	n/a	No impact on mortality and readmissions within 28 days	n/a
	Audit Commission (2008a)	Descriptive/ 2007–2008	n/a	n/a	n/a	n/a	Average clinical coding error of 16.3% across primary and secondary diagnosis and procedure coding (range from 1% to 76%); National mean HRG error rate of 9.4%
	Audit Commission (2009)	Descriptive/ 2008–2009	n/a	n/a	n/a	n/a	Average clinical coding error rate of 12.8% National mean HRG error rate of 8.1%
	Farrar *et al.* (2009)[a]	Difference-in-difference analysis/ 2003–2004 to 2004–2005[b]	Increase in volume of care and in proportion of activity undertaken on a day-case basis	Decrease	n/a	Little evidence of an association between introduction of activity-based payments and quality of care (in-hospital mortality, 30-day post-surgical mortality, hip fracture emergency readmissions)	n/a
	Audit Commission (2010)	Descriptive/ 2009–2010	n/a	n/a	n/a	n/a	Average clinical coding error rate of 11.3% National mean HRG error rate of 9.1%[d]
Finland	Mikkola and Häkkinen (2002)	Count data models/ 1994–1998	n/a	Decrease for hip and knee replacements, but not for lumbar discectomies	n/a	n/a	n/a
	Mikkola (2003)	Panel data models/ 1991–1998	Increase in number of lumbar discectomies. Decrease in number of hip replacements. No statistically significant impact on number of knee replacements	n/a	n/a	n/a	n/a
	Häkkinen and Linna (2005)	Review	n/a	n/a	n/a	n/a	Increased coding of procedures and secondary diagnoses
France	Ministry of Health (2009, 2010)	Descriptive/ 2005–2009	Public hospitals: increase in day-case and inpatient activity in 2007-2008 and 2008-2009 Private hospitals: increase in day-case activity and slight decrease in inpatient activity between 2008 and 2009	Slight decrease for acute inpatient care in public hospitals	Annual growth rate in total hospital expenditure: 4.2% in 2005 5.6% in 2006 4.2% in 2007 3.8% in 2008 3.6% in 2009	n/a	Some upcoding, particularly of day cases
Germany	Böcking *et al.* (2003)	Review	Increase	Decrease	n/a	n/a	n/a
	Schreyögg *et al.* (2005)	Descriptive/ 2003–2004	n/a	Decrease[c]	n/a	n/a	n/a
	Hensen *et al.* (2008)	Descriptive/ 2003–2006	Increase in number of patients and same day patients	Decrease	n/a	No change in number of patients readmitted	Decrease in average number of coded diagnoses Increase in average number of coded procedures in 2006
Ireland	Brick *et al.* (2010)	General review[e]	Increase in number of day cases and inpatients	Decrease	Increase in public expenditure on hospitals	n/a	n/a

(O'Reilly, Busse et al. 2012)

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