

Editorial

More for Less: Best Patient Outcomes in a Time of Financial Restraint

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Abstract: In many countries, expenditure on health care has increased dramatically over recent years. There have been parallel improvements in many indicators of population health, but too many patients continue to be harmed by health care or receive care that is supply-sensitive, ineffective, or poorly aligned with their needs and values. In addition to human costs, this translates into substantial waste of resource. The world has recently faced economic challenges unseen since the great depression of the 1930s. The financial situation of a country can, like a business, be expressed in three sets of accounts: statements of financial position, financial performance, and cash flow. A key test of solvency is the ability to pay debts as they become due (whether from current account or further borrowing). In general, this is a function of public debt, which for many countries has become very high. However, private debt and net financial position are also relevant to a country's financial prospects. Ultimately, borrowing is not sustainable indefinitely and given limited prospects for growth in

income in the coming years, most countries will likely need to reduce or at least constrain expenditure on health care. This implies obtaining better value from the resources that are available, and we suggest that the key to this lies in improving the quality of care and, in particular, reducing variation in health care. In the United States, new legislation promoting accountable care organizations may help to do this. Cardiac surgery can be particularly effective in extending patients' lives and in improving the quality of their lives. Our ability to continue to provide cardiac surgery in the face of constrained economic times will depend on engaging more actively in ensuring that what we do is the right thing: that our operations are effective and that they truly meet the needs and values of our patients. It will also depend on doing these operations right the first time. **Keywords:** economics, cardiac surgery, cardiac anesthesia, perfusion, quality and safety of health care, supply-sensitive care, accountable health care organizations, variation in health care. *JECT. 2012;44:178–185*

Patients should receive the care they need and value, safely, effectively, and affordably; in many countries of the world, expenditure on health care has increased dramatically over recent years, and there have certainly been substantial improvements in many indicators of population health (1); nevertheless, although the exact extent of iatrogenic harm is debatable (2), too many patients con-

tinue to be harmed by the health care that is intended to help them (3) or receive care that is ineffective or poorly aligned with their needs and values (4). In addition to human costs, this translates into substantial waste of precious resource.

During the Global Financial Crisis (GFC) of 2007–2012, the world faced economic challenges unseen since the great depression of the 1930s. Failures of banks and businesses led to recession in many countries. In some countries, wages of health professionals (including doctors) have been cut, and jobs have been lost within the health care sector. Global financial difficulties persist to the present and are likely to continue into the foreseeable future.

Economic uncertainty prevails. Some governments provide reasonably full economic and financial information (see for example www.treasury.govt.nz/budget/forecasts/

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befu2012). However, it is relatively difficult to form a clear view of exactly how serious the financial situation is in any particular country, how this has changed over any given period of time, and what level of improvement, if any, is likely over the next few years. Some countries, notably Portugal, Italy, Greece, and Spain, have received much adverse commentary in the press. Many others, including the United States, the United Kingdom, and New Zealand, are in at least some difficulty, but it is not easy to evaluate the extent of this difficulty.

This question is relevant to those of us who work in health care and perhaps particularly so to those who work in expensive, highly technical areas of medicine such as cardiac surgery. It is not new for government rhetoric to emphasize that ongoing increases in health care expenditure are not sustainable, but it is new for them to act on this rhetoric. Restricting the growth of health care expenditure may have major implications for the sector and indeed for the populations who depend on health care services. The economics of nations is a highly specialized area, difficult for noneconomists to follow. In this article we offer, as noneconomists, a very simple view of some fundamental implications of the GFC for health care as a whole. Some may argue that this view is more simplistic than simple. Given that our conclusions are, on the whole, worrying, we would be welcome more optimistic comments (perhaps in correspondence to the *Journal*) from those with greater expertise.

UNDERSTANDING THE INTERNATIONAL FINANCIAL CRISIS: A BASIC FRAMEWORK

As noneconomists, we find thinking about national finances in terms of home a helpful starting point. At home, each year, we typically earn some money, and we also spend some on living. If there is money left over, this can be accumulated (as cash or in assets). If not, we may need to borrow, perhaps to buy a house or a car for example or perhaps just to meet the costs of living. Over time, borrowing may become unsustainable. This point was well made by Mr. Micawber in Dickens' novel, *David Copperfield*, when he said: "Annual income twenty pounds, annual expenditure nineteen pounds nineteen and six, result happiness. Annual income twenty pounds, annual expenditure twenty pounds ought and six, result misery." This is sometimes called the Micawber Principle.

A business is much the same. The financial situation of a business (and indeed of a household) can be expressed in three sets of accounts: a statement of financial position (often called a balance sheet), a statement of financial performance (often called a profit and loss account), and a statement of cash flow with projections into the future. Of these, the last two may be very different from each

other. The key test of solvency is the ability to pay debts as they become due. Running out of cash leads to bankruptcy even if a company is technically making a profit, unless money can be released from assets or borrowed. Borrowing usually requires security in the form of assets, reflected in the balance sheet. Occasionally borrowing may be possible simply on the basis of projected future cash flow - in effect, confidence on the part of the lender. Whereas national economies are obviously far more complex, we suggest that, in this regard at least, countries are, in the end, no different. If cash flow exceeds expenditure, all is well. If expenditure exceeds cash flow, borrowing becomes necessary. If the balance sheet is positive and future confidence is high, this should not be difficult. If the balance sheet becomes negative and confidence falls, the result (in the words of Mr. Micawber) will be misery. We acknowledge that this view of matters ignores the political implications of allowing a nation to fail financially, but we are not convinced that the possibility of rescue on political grounds would relieve the misery very much.

To take the analogy one stage further, this confidence is likely to depend at least in part on how long the borrowing is for and to what use the borrower intends to put it. A business borrowing to invest in a new plant is likely to be met more favorably than one routinely seeking to borrow to meet everyday running costs. In the same way a country borrowing to keep its public services, which it has always been able to afford, running at capacity during an economic downturn (in the expectation that this will lead to a quicker return to growth by keeping money in the economy) is likely to be met with more sympathetic lenders than one with a history of only affording its social services such as public expenditure on health care by borrowing.

INCOME AND PRODUCTIVITY

The per-capita gross national income (GNI) is the average income per person of an economic aggregate such as a country. Comparing GNI between countries requires a common unit of currency; one can use a standard currency such as the U.S. dollar or attempt to account for different costs within countries. In 2011, in U.S. dollars, the wealthiest countries by this indicator were Monaco (\$183,150) and Lichenstein (\$137,070). Both are very small, so Norway, ranked fourth (\$88,890), provides a more useful anchor for very wealthy countries of some size. The United States (16th: \$48,450), Canada (22nd: \$45,560), and Australia (19th: \$46,200) are very similar on this measure. The United Kingdom (34th: \$37,780) earns a little less per capita. Italy (36th: \$35,330) earns almost as much as the United Kingdom, but Portugal, Greece and Spain earn rather less. New Zealand (42nd: \$29,350) falls within this range of incomes (Table 1). All these countries are

Table 1. Gross national income per capita in 2011 at nominal values and gross domestic product per capita in 2011 in current U.S. dollars (price purchasing parity) for a selection of countries.

	World Bank Rank by GNI per Capita	GNI per Capita U.S. Dollar	Income Group	IMF Rank by GDP per Capita	GDP per Capita \$PPP	Region
Norway	4	88,890	High	3	53,471	Western Europe
Qatar	5	80,440	High	1	102,943	North Africa
United States	16	48,450	High	6	48,387	North America
Australia	19	46,200	High	13	40,234	Australasia
Canada	22	45,560	High	12	40,541	North America
Germany	25	43,980	High	16	37,897	Western Europe
Ireland	32	38,580	High	15	39,639	Western Europe
United Kingdom	34	37,780	High	22	36,090	Western Europe
Italy	36	35,330	High	29	30,464	Western Europe
Spain	40	30,990	High	28	30,626	Western Europe
New Zealand*	42	29,350	High	32	29,535	Australasia
Greece	46	25,030	High	36	26,294	Western Europe
Portugal	51	21,250	High	41	23,361	Western Europe
Latvia	71	12,350	Upper-middle	56	15,662	Eastern Europe
Chile	72	12,280	Upper-middle	52	17,222	South America
Brazil	78	10,720	Upper-middle	75	11,769	South America
South Africa	99	6,960	Upper-middle	78	10,973	Sub-Saharan Africa
China	114	4,930	Upper-middle	92	8,382	Asia
Albania	125	3,980	Lower-middle	96	7,741	Central Europe
India	161	1,420	Lower-middle	129	3,694	Asia
Vietnam	166	1,260	Lower-middle	132	3,359	Asia
Mauritania	179	1,000	Low	148	2,179	Sub-Saharan Africa
Zimbabwe	190	640	Low	181	487	Sub-Saharan Africa

*2010.

Sources: Wikipedia, accessed July 22, 2012; Mundi Index (1); OECD Health Data (5); and Funk et al. (6).
GNI, gross national income; PPP, purchasing power parity.

classified as high income. Latvia (71st: \$12,350) tops the upper-middle-income countries, Albania (125th: \$3980) the lower-middle income countries, and Mauritania (179th: \$1000) the low-income countries.

Using GNI per capita makes no allowance for variation in the cost of living in different countries. The value can be corrected for purchasing power parity (PPP). Gross domestic product (GDP) drives income and can also be corrected in this way. It can be seen from Table 1 that the use of GDP per capita in \$PPP produces somewhat similar results to GNI with minor changes in rank order.

In general, high-income countries have higher rates of literacy, better environmental indicators, and better indicators of health outcome (such as life expectancy and infant mortality) than low-income countries.

There is a fair relationship between region and income (Table 1). This is reflected in the regional variation in certain indicators of health structure such as the number of operating rooms per 100,000 population, which varies from a mean (95% confidence interval) of 25.1 (20.9–30.1) in eastern Europe to 1.0 (.9–1.2) in sub-Saharan Africa with rates of 14.3 (12.2–16.8) in North America and very similar rates in Western Europe and Australasia (6). The availability of pulse oximetry provides an index of the standard of anesthesia care and perhaps of surgical care overall. Essentially all operating rooms have pulse oximetry in North America and western Europe, but in eastern Europe and Asia, approximately one-third are without

oximetry, whereas in Africa, the number without oximetry is probably approximately two-thirds (6). Worldwide, 230 million surgical operations are carried out annually, and slightly more than 30 million of these are performed without pulse oximetry.

EXPENDITURE

Expenditure is best understood in relation to income. One indicator of this is the projected change in net government debt over a given period (Table 2). On this basis, the U.S. government is expected to spend more than it earns over the next 5 years (and thus increase its public debt); the Canadian, Australian, and New Zealand governments somewhat less than they earn; and the U.K. and Norwegian governments about what they earn. Of Portugal, Italy, Greece, and Spain, only Italy is expected to spend less than it earns.

FINANCIAL POSITION

A measure of financial position often discussed is public debt: the amount of money owed by a country's government, usefully expressed as a percentage of GDP. This is relevant to the solvency of any government: its ability to trade and pay its way. If debt is reasonably low, then more borrowing is possible at acceptable rates of interest. However, the picture may be different if private debt is added

Table 2. Public and external debt and net financial position as a percentage of GDP for selected countries with two columns from Table 1 to assist comparisons.

	World Bank Rank by GNI per Capita	GDP per Capita PPP %PPP	Public Debt %GDP 2011	Public Debt %GDP 2016	External Debt %GDP	Net International Investment Position %GDP*	Region
Norway	4	53,471	55.4	55.4	141	79.3	Western Europe
Qatar	5	102,943	27.9	27.1	0		North Africa
United States	16	48,387	100.1	115.4	103	-17.0	North America
Australia	19	40,234	22.8	18.2	95	-64.3	Australasia
Canada	22	40,541	84.1	73.0	64	-7.8	North America
Germany	25	37,897	82.6	75.0	142	37.3	Western Europe
Ireland	32	39,639	109.3	114.3	108	-97.8	Western Europe
United Kingdom	34	36,090	80.8	80.4	360	-13.1	Western Europe
Italy	36	30,464	121.1	114.1	108	-24.3	Western Europe
Spain	40	30,626	67.4	67.4	84	-87.1	Western Europe
New Zealand†	42	29,535	35.3	29.8	126	-90.1	Australasia
Greece	46	26,294	165.6	162.8	174	-83.1	Western Europe
Portugal	51	23,361	106.0	110.5	217	-108.5	Western Europe
Latvia	71	15,662	39.6	39.6	146		Eastern Europe
Chile	72	17,222	10.5	10.9	20	-4.9	South America
Brazil	78	11,769	65.0	57.2	15	-37.5	South America
South Africa	99	10,973	36.1	35.5	23		Sub-Saharan Africa
Republic of China	114	8,382	26.9	10.9	5	+153.3	Asia
Albania	125	7,741	59.4	63.6	23		Central Europe
India	161	3,694	62.4	59.7	22	-10.3	Asia
Vietnam	166	3,359	50.3	44.2	32		Asia
Mauritania	179	2,179	62.0	62.8	52		Sub-Saharan Africa
Zimbabwe	190	487	72.8	61.5	103		Sub-Saharan Africa

*The way this measure is calculated can give misleading comparisons. The overseas lending element (i.e., the positive element) includes lending from both sovereign wealth funds (e.g., in Norway's case) and financial institutions based in the country (e.g., in the United Kingdom). In the former case, this would seem legitimate to include, but in the latter, this is less clear. If private debt is held by overseas-owned financial institutions, this will make the position look worse than if it is held by locally owned banks, but the extent to which this matters is debatable.

†2010.

Sources: Wikipedia, accessed July 22, 2012; Mundi Index (1); OECD Health Data (5).
GDP, gross domestic product; GNI, gross national income; PPP, purchasing power parity.

into the picture, giving a net international investment position (Table 2). Portugal, Italy, Greece and Spain, the United Kingdom, the United States, and Ireland have high public debt at present, and it is this that has captured the imagination of the world press and caused much of the concern about the current international financial situation. Australia and New Zealand are examples of countries with comparatively modest public debt, although they do not have much room to increase current levels. This has tended to give some sense of comfort. However, net investment position paints a very different picture and, assuming this to be related to future growth, probably reflects countries' ability to extract themselves from difficulty over time. In this regard the considerable financial strength of Norway and China is obvious; the United States, Canada, and the United Kingdom appear to be in reasonably strong positions; but New Zealand, Australia, and many European countries would all seem to have cause for concern. The direction of travel is also important; most of these countries have increased debt (and notably public debt) over the last few years, and to continue to do so will certainly become unsustainable at some point. What we might therefore conclude is that a combination of public debt, private debt, and future prospects

for growth is critical. Where both public and private debt are great within a country, and where net investment in the future is low, the future is likely to be bleak.

EXPENDITURE ON HEALTH CARE

Expenditure on health care is often expressed as a percentage of GDP. In 2001, the Institute of Medicine made the following comment in its seminal report, "Crossing the Quality Chasm: A New Health System for the 21st Century": "Americans now invest annually \$1.1 trillion or 13.5% of the nation's GDP in the health care sector. This figure is expected to grow to more than \$2 trillion or 16% of GDP, by 2007."

This prediction was accurate and the figure is expected to reach 20% by 2020. Between 1980 and 2007, expenditure increased by approximately 18% in OECD countries overall (7). Because of the differences in GDP between countries, the spread is greater for actual expenditure per capita. Over this period, expenditure in the United States has gone from approximately \$1000 per capita to over \$7000 and Australia and New Zealand from rather lower bases to \$3357 and \$2454, respectively (all values US\$ PPP).

Table 3. In 1998 total expenditure on health care in New Zealand was \$1450 \$US PPP per capita.*

Year	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
a	1.3	2.4	2.6	2.7	1.8	2.4	3	3.8	2.4	4	2.1	2
b	1522	1607	1709	1841	1849	1974	2124	2388	2447	2697	2923	3022
c	1469	1504	1543	1585	1613	1652	1702	1766	1809	1881	1921	1971
d	53	103	166	256	235	321	422	621	638	815	1002	1051

*Row a: annual inflation %. Row b: actual expenditure. Row c: estimated expenditure on the basis of increases in line with inflation. Row d: difference between increase attributable to inflation and actual increase. No allowance has been made for changes in demand, attributable for example to a change in the distribution of ages within the population.

Source: CIA factbook for inflation data. Available at: www.indexmundi.com/g/g.aspx?c=nz&v=71 and OECD Health Data. Available at: www.oecd.org/document/16/0,3746,en_2649_37407_2085200_1_1_1_37407,00.html.

PPP, purchasing power parity.

The question arises as to whether these increases are real after allowing for inflation. An illustration of how this might be calculated is provided for New Zealand in Table 3. For this country at least, it does seem as if the increase in expenditure is considerably more than can be accounted for by inflation (approximately \$1000 over the 12-year period of the calculation in the table, so almost \$100 per year). Much the same can be said for most OECD countries between 2001 and 2009. This leaves unanswered the further question of whether increases have also kept up with demand driven by such things as an increasing proportion of elderly people within most OECD populations (notably in New Zealand). At any rate, increases in health care expenditure have clearly exceeded increases in GDP, considerably, and this obviously cannot be continued indefinitely. Interestingly, the growth in health care expenditure has slowed in 2011, and in some instances stopped altogether, or even reversed.

RESPONDING TO THE FINANCIAL CHALLENGE

An ideal response to the position many countries find themselves in would be to earn more and spend less. Decisions over what investment is appropriate to enhance earnings, particularly in the presence of debt, are both very difficult and contentious. So are decisions over the proportion of the available resource to spend on things such as defense, education, infrastructure, and health care. What is clear is that money spent on health care is not available to spend on these other important things, and therefore escalating health care costs imply that we have progressively less money for our other needs.

Health care is very highly valued by most societies. It is politically very difficult for any government to reduce health care expenditure. It is relevant that a number of high-level indicators of public health such as life expectancy have increased in high-income countries over the last two or three decades. In general, people are living longer in better health and amenable mortality has decreased in relation to many conditions. However, these improvements may not be entirely attributable to improvements in health

care nor to the recent increases in health care expenditure. Notably, it does not seem that those countries that spend more per capita on health care necessarily achieve better health outcomes than those whose expenditure is somewhat more modest (7). Furthermore, many people continue to be harmed by the health care they receive, fail to access health care they need, and fail to achieve outcomes from health care that align with their true needs and values (8).

Our view, therefore, is that increases in expenditure, as seen in recent years, not supported by parallel increases in GDP cannot be tolerated indefinitely. Our belief is that such increases in GDP are highly unlikely in the short term and it seems reasonable to us for governments to address this problem urgently. This leads to the question of how leaders in health care should respond to the fact that further increases in health care expenditure are unlikely in the next few years.

THE TRIPLE AIM

In the United States, the Institute of Health Care Improvement (IHI) has articulated the health care challenge faced by many countries in its “Triple Aim” (9,10).

The IHI Triple Aim involves the simultaneous pursuit of three dimensions: 1) improving the patient experience of care (including quality and satisfaction); 2) improving the health of the populations; and 3) reducing the per-capita cost of health care.

It is relevant that the United States has by far the highest expenditure on health care of any of the countries we have considered both as a percentage of GDP and in absolute terms. New Zealand is an example of a country whose expenditure in absolute terms is much lower but in which recent increases as a percentage of GDP have exceeded the OECD average (11). Taking this into account, the Triple Aim has therefore been refined in New Zealand. In particular, the third aim has been modified to indicate that health care expenditure may not necessarily need to be reduced but that wastage is unaffordable. The New Zealand Triple Aim is the simultaneous pursuit of: improving the quality, safety, and experience of care; improving health

and quality for all populations; and gaining the best value from the resources made available to the . . . health system.

Underlying both of these “Triple Aims” is a belief in the financial soundness of improving the quality of health care. There are two key requirements to achieving high-quality health care.

First, it is necessary to do the right things for everyone who needs them and only the right things. This is usually discussed in relation to the concept that, in most health care systems, some people are undertreated for various reasons, whereas others are overtreated. By reducing both sides of this imbalance, it seems probable that better outcomes could be achieved for everyone without any increase in cost (12).

Second, it is necessary to do things right the first time. The human and financial costs of harm from health care are considerable (3,4) and reducing these must be a priority.

These two requirements can be achieved by the relentless pursuit of all the elements of quality in health care, including timeliness, efficiency, efficacy, equitability, and patient-centeredness (captured by the acronym STEEEP) (13).

The importance of timeliness, efficiency, efficacy, and safety is fairly self-evident. It is not always appreciated that improving the equitability of health care tends to improve outcomes for everyone, not just the parts of the population that were previously disadvantaged (12). In part this is because unwarranted variation in health care usually includes overtreatment as well as undertreatment, and there are substantial risks in overtreatment. It is for this reason that the New Zealand Triple Aim has a second modification: the explicit reference to improving the health of all populations.

Patients who are well informed and understand their options (including the option of doing nothing) are likely to make better choices than those who are not and also to contribute more to ensuring that their treatment is safe and successful (4,14–16). Communication and coordination between health care workers is also important, particularly in the operating room and in complex procedures with multiple teams typical of cardiac surgery (17–22).

VARIATION IN HEALTH CARE

That improvements in all three arms of the Triple Aim are possible is suggested by the fact that there is often substantial variation in the care patients receive and in the outcomes of that care, and cardiac surgery is no exception (23,24). This variation is often difficult to explain by case mix or variation in resource. Instead, it seems often to reflect differences in the approach of health care providers (23,25). Fisher and Wennberg (26) have described an analytic framework for understanding variation in health care with three categories of medical services: effective care,

preference-sensitive care, and supply-sensitive care. They suggest that the first of these should be received by all patients and that there should be little conflict between patients and providers over its value. Regrettably, this category of care is typically characterized by underuse. Preference-sensitive care refers to treatments of uncertain value, often with tradeoffs between options. The management of early prostatic cancer is an example. Again, regrettably, the choices made in relation to this category of care often reflect physicians’ preferences more than patients’ preferences. Supply-sensitive care is perhaps the most worrying category; in this category (examples include physician revisits and many diagnostic tests), medical theory and evidence is weak, rates of use are strongly influenced by the supply of resources, and the risk of overuse is considerable (at least in high-income regions of the world). The introduction of new technology at high cost provides particular challenges. This point has been well made in respect of transaortic valve implantation (TAVI) for aortic stenosis (27). TAVI is innovative but costly. Furthermore, it carries substantial risks, notably the risk of stroke, which many patients fear as much as they fear death. The appropriate indications for TAVI are still to be firmly established. There is little doubt that it has a place in managing some patients at high risk for conventional aortic valve surgery, but it would be unfortunate if its use were to be driven by supply rather than evidence of effectiveness or by physician preferences rather than the preferences of fully informed patients.

Other factors such as prejudice and patient preferences may also play a part in driving variation (28–30). When doctors go on strike, mortality rates do not usually increase (31). There are various explanations for these findings, but they do illustrate the point that more is not necessarily better in health care. Variation in the use of health care in the last year of life is particularly relevant to any discussion of patient-centered health care (30).

International variation in the provision of health care is even more marked than that seen within countries. For example, 35% of the world’s population receives only 3.5% of the 230 million surgeries performed worldwide annually (32). The standard of anesthesia in this group is also often very poor (33). There is clearly enormous potential to improve health care in low-income regions of the world, but the challenge, clearly, will be to do this as cost-effectively as possible (34,35).

It seems clear to us that further substantial increases in public health expenditures will be very unlikely in the near- to medium-term future. The only obvious alternative that remains to maximizing the value of health expenditure is an arbitrary rationing of care to fit available expenditure without regard either to clinical value or population need. Such an approach will not only limit access to new treatments, but it will also increase inequalities.

EVALUATION

Although this point is sometimes debated (36), measurement is generally held to be fundamental to quality improvement (37–39). Outcomes are most important, but they are typically difficult to measure, and measures of process and structure are often more readily available.

THE AFFORDABLE CARE ACT AND ACCOUNTABLE CARE ORGANIZATIONS

President Obama signed the Patient Protection and Affordable Care Act into law in 2010 (40). This legislation encourages the provision of a new model of patient care, the accountable care organization (41,42). This approach seeks to reward physicians and hospitals for the provision of cost-effective evidence-based health care on the basis of performance measurements and quality markers. It would be reasonable to hope that it would lead to less supply-sensitive care and more effective care. Patient preferences will also need to be considered and reflected in the quality markers. There has been considerable controversy over this legislation, possibly reflecting the complexity of the challenge and the difficulties inherent in driving genuine improvement in the quality of health care, but there can be little doubt about the need to obtain better value from the money spent on delivering health care in the United States and (as reflected in the New Zealand version of the Triple Aim, for example) in many other countries as well.

CONCLUSIONS

It is very easy to look unsympathetically at those countries where the economic crisis is at its most acute. The term “PIGS” has been used in the media in reference to Portugal, Italy, Greece, and Spain (43), but the implication that these particular economies are somehow more worthy of criticism than others may be misguided. Those in other countries may be well advised to consider whether their position is much better; in many (the United States, the United Kingdom, and New Zealand for example), the situation is indeed a little better on some indicators, but not necessarily on others. It would be a shame to discover too late that one’s own country was, as it were, one of a number of (so-called) “PIGS” that are still “flying,” about to crash and burn.

On the basis of the facts presented, it is unrealistic and unreasonable to expect governments to continue to increase expenditure on health care. It is essential to find ways to obtain better value from the resources that are available. Cardiac surgery can be particularly effective in extending patients’ lives and in improving the quality of their lives. Our ability to continue to provide cardiac

surgery in the face of constrained economic times will depend on engaging more actively in ensuring that what we do is the right thing: that our operations are effective and that they truly meet the needs and values of our patients. It will also depend on doing these operations right the first time.

REFERENCES

1. Index Mundi. Available at: www.indexmundi.com/g/g.aspx?v=66&c=nz&l=en. Accessed July 22, 2012.
2. Hayward RA, Hofer TP. Estimating hospital deaths due to medical errors: preventability is in the eye of the reviewer. *JAMA*. 2001;286:415–20.
3. Kohn LT, Corrigan JM, Donaldson MS, eds. *To Err Is Human: Building a Safer Health System*. Washington, DC: National Academy Press; 1999.
4. Runciman B, Merry A, Walton M. *Safety and Ethics in Healthcare: A Guide to Getting it Right*. Aldershot, UK: Ashgate; 2007.
5. OECD Health Data. 2012—Frequently Requested Data. 2012. Available at: www.oecd.org/document/16/0,3746,en_2649_37407_2085200_1_1_1_37407,00.html.
6. Funk LM, Weiser TG, Berry WR, et al. Global operating theatre distribution and pulse oximetry supply: An estimation from reported data. *Lancet*. 2010;376:1055–61.
7. Davis K, Schoen C, Stremikis K. *Mirror, Mirror on the Wall: How the Performance of the U.S. Health Care System Compares Internationally*. 2010 Update. Commonwealth Fund; June 2010.
8. Merry AF. Ethics, industry, and outcomes. *Semin Cardiothorac Vasc Anesth*. 2008;12:7–11.
9. Berwick DM, Nolan TW, Whittington J. The triple aim: Care, health, and cost. *Health Aff*. 2008;27:759–69.
10. The IHI Triple Aim. Available at: www.ihiofferings/Initiatives/TripleAim/Pages/default.aspx. Accessed July 21, 2012.
11. The Triple Aim. Available at: www.hqsc.govt.nz/news-and-events/news/126/. Accessed July 21, 2011.
12. Pickett K, Wilkinson R. *The Spirit Level*. New York, NY: Bloomsbury Press; 2009.
13. Institute of Medicine. *Crossing the Quality Chasm: A New Health System for the 21st Century*. Washington, DC: National Academy Press; 2001.
14. Wright JG, et al. Patient preferences before and after total knee arthroplasty. *J Clin Epidemiol*. 2010;63:774–82.
15. Barry MJ, Edgman-Levitan S. Shared decision making—Pinnacle of patient-centered care. *N Engl J Med*. 2012;366:780–1.
16. Cassell EJ. Consent or obedience? Power and authority in medicine. *N Engl J Med*. 2005;352:328–30.
17. Bodenheimer T. Coordinating care—A perilous journey through the health care system. *N Engl J Med*. 2008;358:1064–71.
18. Haynes AB, Weiser TG, Berry WR, et al. A surgical safety checklist to reduce morbidity and mortality in a global population. *N Engl J Med*. 2009;360:491–9.
19. Haynes AB, Weiser TG, Berry WR, et al. Changes in safety attitude and relationship to decreased postoperative morbidity and mortality following implementation of a checklist-based surgical safety intervention. *BMJ Quality & Safety*. 2011;20:102–7.
20. Neily J, Millis PD, Young-Xu Y, et al. Association between implementation of a medical team training program and surgical mortality. *JAMA*. 2010;304:1693–700.
21. de Vries EN, Prins HA, Crolla RM, et al. Effect of a comprehensive surgical safety system on patient outcomes. *N Engl J Med*. 2010;363:1928–37.
22. Birkmeyer JD. Strategies for improving surgical quality—Checklists and beyond. *N Engl J Med*. 2010;363:1963–5.
23. Birkmeyer JD, Sharp SM, Finlayson SR, Fisher ES, Wennberg JE. Variation profiles of common surgical procedures. *Surgery*. 1998;124:917–23.

24. McGlynn E, Asch SM, Adams J, et al. The quality of health care delivered to adults in the United States. *N Engl J Med*. 2003;348:2635–45.
25. Toronto Arthroplasty Research Group Writing Committee, Wright JG, Hawker GA, Hudak PL, et al. Variability in physician opinions about the indications for knee arthroplasty. *J Arthroplasty*. 2011;26:569–75.e1.
26. Fisher ES, Wennberg JE. Health care quality, geographic variations, and the challenge of supply-sensitive care. *Perspect Biol Med*. 2003;46:69–79.
27. Van Brabant H, Neyt M, Hulstaert F. Transcatheter aortic valve implantation (TAVI): Risky and costly. *BMJ*. 2012;345:e4710.
28. Hawker GA, Wright JG, Coyte PC, et al. Determining the need for hip and knee arthroplasty: The role of clinical severity and patients' preferences. *Med Care*. 2001;39:206–16.
29. Borkhoff CM, Hawker GA, Kreder HJ, Glazier RH, Mahomed NN, Wright JG. Patients' gender affected physicians' clinical decisions when presented with standardized patients but not for matching paper patients. *J Clin Epidemiol*. 2009;62:527–41.
30. Kwok AC, Semel ME, Lipsitz SR, et al. The intensity and variation of surgical care at the end of life: A retrospective cohort study. *Lancet*. 2011;378:1408–13.
31. Cunningham SA, Mitchell K, Narayan KM, Yusuf S. Doctors' strikes and mortality: A review. *Soc Sci Med*. 2008;67:1784–8.
32. Weiser TG, Regenbogen SE, Thompson KD, et al. An estimation of the global volume of surgery: A modelling strategy based on available data. *Lancet*. 2008;372:139–44.
33. Walker IA, Wilson IH. Anaesthesia in developing countries—A risk for patients. *Lancet*. 2008;371:968–9.
34. Merry AF, Cooper JB, Soyannwo O, Wilson IH, Eichhorn JH. International standards for a safe practice of anesthesia 2010. *Can J Anaesth*. 2010;57:1027–34.
35. Walker IA, Merry AF, Wilson IH, et al. Global oximetry: An international anaesthesia quality improvement project. *Anaesthesia*. 2009;64:1051–60.
36. Leape LL, Berwick DM, Bates DW. What practices will most improve safety? Evidence-based medicine meets patient safety. *JAMA*. 2002;288:501–7.
37. Donabedian A. *An Introduction to Quality Assurance in Health Care*. New York, NY: Oxford University Press; 2003.
38. Tenner EW. *Why Things Bite Back—Technology and the Revenge of Unintended Consequences*. New York, NY: Vintage Books; 1997.
39. Shekelle PG, Pronovost PJ, Wachter RM, et al. Advancing the science of patient safety. *Ann Intern Med*. 2011;154:693–6.
40. Stolberg S, Pear R. Obama Signs Health Care Overhaul Bill, with a Flourish, in *The New York Times*. March 23, 2010. Available at: www.nytimes.com/2010/03/24/health/policy/24health.html. Accessed October 28, 2012.
41. ACO Learning Network. Available at: <http://acolearningnetwork.org>. Accessed October 28, 2012.
42. Goodney PP, Fisher ES, Cambria RP. Roles for specialty societies and vascular surgeons in accountable care organizations. *J Vasc Surg*. 2012;55:875–82.
43. Europe's PIGS. Country by country; story from BBC News, November 2, 2010. Available at: <http://news.bbc.co.uk/go/pr/fr/-/1/hi/business/8510603.stm>. Accessed October 28, 2012.