Pharaoh and the Prospects for Productivity in HHR

Le pharaon et le potentiel de productivité dans les RHS

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Abstract

When Pharaoh refused to supply straw, productivity plummeted in the Egyptian brick industry. But Pharaoh had other concerns. Anyway, the costs fell on Israelites, not Egyptians. Productivity improvement in the health sector is similarly constrained by competing objectives, and by the distribution of resulting gains and losses. Furthermore, health services have value only insofar as they improve health outcomes. Increased output of ineffective services is not productivity in any meaningful sense. Yet most of the literature on health human resources productivity focuses on outputs, not outcomes, ignoring serious questions about effectiveness. Proposals to refine the treatment of the health sector within the national accounts are similarly flawed. Proliferation of beneficial, harmful or simply unnecessary services would all be recorded as "productivity growth."

Résumé

Lorsque le pharaon refusa de fournir de la paille, la productivité dans l'industrie égyptienne de la brique connut un déclin. Le pharaon avait d'autres préoccupations. Néanmoins, ce sont les Israéliens qui en ont payé les frais, pas les Égyptiens. L'amélioration de la productivité dans le secteur de la santé est semblablement contrainte par des objectifs concurrentiels, ainsi que par la distribution des pertes et des gains qui en découlent. De plus, ce n'est que par l'amélioration des résultats pour la santé que les services de santé acquièrent leur pleine valeur. Accroître les extrants pour des services inefficaces n'est d'aucune façon un signe de productivité. Cependant, la

plupart de la littérature sur la productivité des ressources humaines en santé met l'accent sur les extrants, pas sur les résultats, faisant ainsi fi des questions importantes au sujet de l'efficacité. Les propositions visant à mettre au point le traitement du secteur de la santé dans les comptes nationaux sont également sans fondements. Toute prolifération de services, qu'ils soient avantageux, nuisibles ou simplement inutiles, serait donc considérée comme une « croissance de la productivité. »

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> Ye shall no more give the people straw to make brick, as heretofore;
> let them go and gather straw for themselves.
> And the tale of the bricks, which they did make heretofore, ye shall lay upon them; ye shall not diminish ought thereof; for they be idle, therefore they cry, saying Let us go and sacrifice to our God.
> Let there be more work laid upon the men, that they may labour therein; and let them not regard vain words.
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> – Exodus 5: 7–9

Productivity and Politics: Competing Objectives

There are implications for health human resources productivity (HHRP) in the biblical story. Pharaoh had a serious political problem on his hands; his country was economically dependent on a growing number of increasingly restive and troublesome gästarbeiter. This edict deliberately *lowered* HRP in the Egyptian brick industry – more Israelite-hours used per brick produced – in order to work the Israelites harder.[1] Economic efficiency was sacrificed to other objectives, in the much larger context of political, ethnic and religious conflicts. And anyway, the sacrifice was all borne by the Israelites.

The overriding importance of diverse and conflicting interests is the principal message for contemporary discussions of HHRP. Improvements in labour productivity are incontestably the fundamental basis for all improvements in human material well-being. It may therefore be tempting to imagine that because health services are a labour-intensive industry – i.e., a high proportion of costs are direct payments to various types of workers – the pressures of escalating costs could be mitigated by raising the productivity of those workers – getting more care for less money.

Such hopes will be disappointed, however, insofar as they run counter to the interests of the major "stakeholders" in the health services sector. The connection between labour productivity and material well-being holds only for *averages*, and gains in labour productivity are rarely if ever shared equally. Some gain, others lose; and those

who become more productive are not necessarily the gainers, as the Luddites clearly understood. Whether or not potential productivity gains are actually achieved will therefore depend upon the distribution of power among gainers and losers.

Producing Health – Don't Just Do Something

The analysis of HHRP adds a second layer of complexity. A good health system must, among other things, both *do the right thing* and *do things right*. Productivity measurement in the general economy is typically focused on "doing things right"; improvement consists in reducing the inputs required per unit of output – Israelite-hours of work per brick – thus generating an increased flow of goods and services from a given labour force. Requiring brick-makers to glean their own straw when other sources are available is not "doing things right." The right thing to do, however, is determined by Pharaoh or in other contexts the market.

Health is different. Here, "doing the right thing" is as important as "doing things right." Failure to do things right wastes time, effort and other resources; failure to do the right thing – and especially doing the wrong thing – may result in injury or death. Even if no harm is done directly, the patient's condition may worsen for lack of effective care. But "the right thing" can be defined only in terms of health outcomes achieved and depends critically upon the patient's circumstances. It would obviously be nonsense to record as "improved productivity in the health sector" increased services that were, on the whole, ineffective or harmful to patients' health.

By far the world's most egregious example of "doing things wrong" in health is provided by the American private health insurance industry.[2] It generates enormous extra costs for administrative overheads – somewhere between $300- and $400-billion USD in 2009, or well over $1,000 for every person in the country.[3] In return for this vast extra expenditure, non-elderly Americans collectively receive insurance coverage that is not only incomplete and unstable but also potentially subject to *retroactive* cancellation (rescission) in response to large claims. A switch to a universal medicare system as in Canada could, as many Americans have observed, yield productivity gains (greater security, lower cost) large enough to show up as several percentage points of national income (gross domestic product, or GDP).[4] These gains would be sufficient to cover all of the currently uninsured, with money left over. Covering the uninsured would significantly reduce mortality rates (Wilper et al. 2009).

Why, then, is private health insurance not suppressed as a threat to public health and morals? Most obviously, because it is sustained by a huge, wealthy and politically powerful industry that is able to mobilize deep and irrational ideological responses – ask President Obama (or his secretary of state!). More fundamentally, every dollar spent on administrative waste, however useless or harmful, is a dollar of someone's income.[5] In a more rational system, those incomes would vanish. So, private insurers

have mobilized congressional support to block any "public option" with which they could not hope to compete on cost. If Americans want to extend coverage for the under- and uninsured, they must permit this grotesquely inefficient private industry to siphon off a great deal more public money.

Known Unknowns – and Known Knowns

Similar issues of cost without benefit arise within the provision of health services themselves, regardless of the form of financing, though they emerge more often as doing the wrong thing rather than as doing things wrong. Efforts to promote "evidence-based medicine" reflect a widespread presumption that much of the care provided in modern health systems is not evidence-based. Insofar as it is not, it follows that some proportion of the services provided are likely to be not only useless but actively harmful to health – doing the wrong things, however efficiently. It would obviously be misleading – silly – to report increases in such ineffective services, at whatever cost, as improvements in HHR "productivity."

Medicine is a complex endeavour, a (partially) science-based art rather than a science. The increasing power of medical interventions inevitably increases the associated risks. The best one can hope for is that, on the basis of the best existing evidence, interventions are likely to do more good than harm for those to whom they are offered.

There are at least three classes of research indicating that this assumption does not always hold. Most obvious is the current concern with "medical error," which focuses on the harm done to patients by errors of commission or omission that could and should have been avoided given current knowledge. Second is the whole field of clinical epidemiology, the continuing effort to evaluate, often through randomized trials, the effectiveness of the ever-growing and changing array of potential interventions. These two lines of inquiry, while sometimes raising embarrassing observations, nevertheless fit within the standard medical program – improving the performance of individual clinicians, and refining the knowledge base. The third – the widespread and long-standing observations of large-scale geographic and institutional variation in clinical practice, noted in a previous column (Evans 2009) – is a more "inconvenient truth," indicating as it does that a great deal of clinical activity may be ineffective at best.

These fields are far too extensive to permit even a cursory review here. Ideally, though, their findings would translate into changes in clinical practice that would improve productivity – expanding the scope of effective care and weeding out the ineffective or harmful. But the world is more complicated; we can offer a few leading examples of trends in clinical practice in Canada that illustrate the difficulties encountered by efforts to improve HHRP.

Productivity Gains in Hospitals Get No Respect

During the budgetary reductions of the mid-1990s, hospital in-patient use in Canada fell dramatically (Barer et al. 2003). Lengths of stay were cut, and many procedures were shifted from in-patient to day care. Nursing and other staff were correspondingly reduced. That in-patient care was previously often used unnecessarily had been known for years; budget cuts finally overcame a quarter-century of inertia. There were many claims of harm to patients, but no convincing evidence ever materialized.

Clearly, if health outcomes did not suffer, and fewer resources – primarily labour – were required, then HHRP must have increased. Simply counting hospital outputs, however, could easily lead to a different conclusion. Days of in-patient care fell sharply, while the average service intensity and cost of the remaining days increased. If in-patient days are "outputs," then productivity also fell because more resources were required per unit of "output." A better index of output might be the number of cases treated, each weighted according to its relative cost. But even this measure can generate erroneous results. If in-patient and day surgery are defined as different products, and the latter are assigned lower weights, then the shift of procedures from in-patient to day care would appear as a reduction in "output" rather than as an increase in productivity.

These reductions in in-patient use have not been widely recognized and celebrated as improvements in HHRP. Rather, they were bitterly attacked, particularly by nurses' organizations, as threats to the health and safety of patients. ("Some Cuts Don't Heal" was a brilliant slogan.) Public confidence in the Canadian health system was undermined and has never fully recovered, despite large subsequent infusions of additional money. In-patient utilization has remained down, raising the obvious question of where all the new money is going.

Wherever it is going, however, every additional dollar is going to *someone* as income. On the other hand, "saved resources" are also known as lost jobs and lost incomes.[6] The productivity improvement of the 1990s may have yielded better health at lower cost – hospitals can be dangerous places – but certainly no benefits to staff.

Pictures of Health?

Diagnostic imaging offers another example of confusion between outputs and outcomes. HHRP appears to have improved dramatically in recent years (CIHI 2008). Newer, better machines, many more procedures per technician – a standard industrial measure – and much more expenditure on imaging. But has the accuracy of diagnoses improved? If so, have therapeutic trajectories been changed? Finally, has all this increased imaging activity improved patient outcomes? No one knows.

What is known is that the availability of diagnostic imaging varies among comparable countries by a factor of about 10, from Japan (92.6 CT scanners and 40.1 MRI

machines per million population) to the Netherlands (5.8 and 5.6). But there are no reports of improved health outcomes associated with higher rates of imaging availability. Increasingly efficient production of images (doing things right) with no identifiable impact on health outcomes (doing questionable things) represents falling, not rising, productivity.

Further, evidence is emerging to indicate that CT scans in particular can be dangerous. The radiation exposure is sufficient to generate a small but measurable increase in the risk of subsequent cancers (Berrington de Gonzáles et al. 2009), and the dose of radiation varies widely among scans for unknown reasons (Smith-Bindman et al. 2009). Increases over time in CT scanning rates may thus be expected to contribute to increases in cancer rates; this outcome should increase the importance of identifying and quantifying offsetting therapeutic benefits.

Diagnostic ultrasound procedures have also increased dramatically; You and colleagues (2010) report a 58.8% increase between 1996 and 2006 in frequency of ultrasound for singleton pregnancies in Ontario among both high- and low-risk patients. The authors conclude:

> Substantial increases in the use of prenatal ultrasonography over the past decade do not appear to reflect changes in maternal risk. … Efforts to promote more appropriate use of prenatal ultrasonography for singleton pregnancies appear warranted.

Put another way, this is a case of large increases in resource inputs for no improvements in health outcomes – falling productivity – even if no evidence of harm has yet been reported. But "promoting more appropriate use" will be confronted by the fact that providers were paid for all these procedures. And behind them are all those who draw incomes from the corporations that make, market and maintain the machines.

Second Death of a Good Idea

In the physicians' services sector, discussions of HHRP have for 40 years focused intermittently on the extensive evidence that many of the tasks performed by primary care physicians could be performed equally well and less expensively by nurse practitioners or other intermediate-level personnel – same output, less expensive inputs. Some transfer of tasks has occurred, but the potential savings have never materialized. Primary care remains dominated by physicians.

There are two reasons for this failure to "do things right." One is that potential savings are easily dissipated through overtraining, credentializing and time-intensive styles of practice – team meetings, long educational consultations – that can make the services of the less highly paid personnel more expensive, in actual practice, than those

of the highly paid. This approach understandably undermines any support for change from governments as payers for care.

The second reason is perhaps more fundamental. Cost savings from increased productivity require substitution of the less for the more costly inputs – e.g., more nurse practitioners but fewer doctors. This has not happened in the past, and will not happen in the future. "More of everybody" is a recipe for lower productivity and higher overall costs.[7]

Much of the best analysis of nurse practitioners as substitutes for physicians was done in the early 1970s, simultaneously with large expansions in medical schools enrolments. The subsequent large rise in doctor-to-population ratios eliminated the principal *raison d'être* for alternatives. Interest revived briefly in the 1990s after the doctor-to-population ratio finally stabilized. Once again, however, a major ramping up of medical school capacity has generated a coming surge of new doctors – just now beginning to arrive.[8] Canada's medical schools, and the governments that supported them, have doomed for another generation any prospects for input substitution, and associated productivity improvement, in this sector.

Historical patterns of physician activity, primarily reflected in billings, also raise questions about "doing the right thing." Activity levels per physician rose during the decades in which supply was expanding; over the past decade they appear to have risen even faster, despite falling average hours of work.[9] This finding suggests (quite large) increases in productivity per physician – measured by service outputs. But how has this increased activity contributed to health outcomes? Again no one knows, and the question will become more pointed as physician supply rises over the next two decades.

Health Services Research Literature – A Failure to Communicate

The health services research literature on HHRP, if one includes everything bearing on the subject, is vast. Yet it is almost entirely focused on measuring outputs rather than outcomes. Much focuses on "doing things right" – producing either more output with less input, or often simply more with more. Very little addresses "doing the right things." In this literature "more is better" is taken, typically implicitly, as self-evident; HHRP studies rarely concern themselves with explicit evidence of health benefits. A standard keyword search for literature on HHRP yields an unmanageably large list of references, yet despite their obvious relevance will not bring up any of the literature on clinical variations, or health technology assessment, or the results of clinical trials.[10]

In fairness, the linkage with the variations literature would be difficult. There is powerful evidence not only that, overall, more is not better, but also that geographical and institutional variation is concentrated among services that are at the physi-

cian's discretion. Services that are unambiguously needed, or alternatively can be left at the patient's choice, do not show such variation. But the observation of variations in aggregate is still not specific as to which services, for which patients, are unnecessary or harmful, and clinical decisions must be made at the individual patient level. The disconnect may also, however, reflect the fact that a focus on outputs tends to be input-using, while that on outcomes has more potential to be input-saving, and thus threaten incomes and jobs.[11]

More Precisely Wrong? Health Services in the GDP

Output-based measures of productivity all embody the implicit assumption that "more is better." The GDP as traditionally interpreted in the public discourse celebrates this explicitly – "more" is growth, and growth is good.[12] Health services are different. More is definitely not better per se. In many very specific and concrete situations it can be worse, and we all know this. What we want is better health, and this requires just enough – no more – of the *right kinds of care*. In many circumstances, less is more.

Recent proposals by statistical agencies and other analysts to revise the treatment of health services in the national accounts (see the discussion in Sharpe and Bradley 2008) are thus entering onto dangerous ground. Sharpe and Bradley observe that the growth of productivity in the health services sector may be seriously underestimated because the measurement of health sector output in Canada is primarily based on the volume of inputs. Their report for "stakeholders" (more specifically, the Canadian Medical Association) encourages the development of "better measures of health sector output and productivity" that would presumably show that sector in a more favourable light.

But the national accounts, and the GDP estimated from them, explicitly measure activity, economic capacity, *not* well-being.[13] All the administrative waste in private insurance is counted in the GDP, and Canada's GDP shrank when hospitals became more efficient. Expanded and refined measures of health sector outputs consistent with the principles of national income accounting will, when built into the GDP, yield estimates of health sector "productivity" that are completely detached from actual health outcomes and are consequently irrelevant, when not actively misleading.

When the report of the Sarkozy commission was released in September 2009 (Stiglitz et al. 2009), Joseph Stiglitz warned:

> In an increasingly performance-oriented society, metrics matter. What we measure affects what we do. If we have the wrong metrics, we will strive for the wrong things. In the quest to increase GDP, we may end up with a society in which citizens are worse off. (quoted in Osberg and Sharpe 2009)

However statistical agencies may mangle the concept of productivity in health

services, the notion that the escalation of health expenditures can be mitigated through improvements in HHRP is either charmingly naïve or deliberately disingenuous. "Human resources" – aka people – account for a high proportion of health spending, and there is an evidence base on which to draw for examples of improvements in HHRP. But this fact is unlikely to mitigate rising health expenditure. If productivity is measured, wrongly, in terms of outputs, increased "productivity" will take the form of more output and higher costs. If it is defined, correctly, in terms of health outcomes, improved productivity threatens jobs and incomes. Better health for less money is in everyone's collective interest – and no one's individual interest.

In the end, the Lord sorted out Pharaoh. Perhaps we should pray.

NOTES

1. Proverbially, "You cannot make bricks without straw" – they break. Mud brick is a composite material like fibreglass, in which the straw prevents the propagation of cracks in the brittle matrix. Pharaoh might have been better advised just to "let my people go," but the Lord had hardened his heart. He was being set up for a demonstration to Israel that the God of their fathers was the One True God. Pharaoh was being led, as if by an "invisible hand," to encompass an end that was no part of his intention.
2. Private health insurance generates similar excess administrative expense in other countries, including Canada; the costs are on a much smaller scale only because the scope of the private insurance industry is more restricted.
3. These estimates combine both the extra administrative costs incurred by private insurers relative to a public system, and those incurred by hospitals, physicians and other providers in dealing with the complexities of a private system (though not those incurred by the insured in negotiating their claims).
4. Administrative waste amounts to nearly 20% of American health expenditures, which in turn amount to over 16% of GDP, so the waste is over 3% of GDP.
5. Private insurance also provides an alternative to the egalitarian bias of public programs – offering better coverage and access for those with higher incomes, without the cost of providing similar benefits for the unhealthy and unwealthy.
6. Pharaoh, on the other hand, was providing increased employment. This outcome might have been less unpopular if he had paid a decent hourly wage.
7. Managed care organizations in the United States are able to achieve productivity gains from personnel substitution because they can control their own input numbers and mix. Yet "partial strength produces general weakness" – their productivity gains are achieved at the cost of the unmanaged system in which they are embedded.
8. This result was anticipated nearly a decade ago (Barer 2002).
9. The picture is considerably muddied, however, by the spread of alternative payment programs, various forms of service contracts in which it is difficult to resolve expenditure increases into price and quantity changes.
10. A more comprehensive review is provided in Evans and colleagues (2010).

11. That said, however, we believe that few if any of the participants in the health system sector (or any other) set out deliberately to reduce productivity. Like Pharaoh, they are pursuing other objectives that seem to them reasonable, unaware of any side effects of forgone productivity.
12. The fact that growth may be killing the planet has not yet reached the business pages.
13. The original architects of the national accounts were very explicit on this point. For a recent example of an effort to measure economic well-being in Canada, see Osberg and Sharpe (2009).

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