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What Should Be Exchanged for a Human Life?

Cost-Benefit and COVID-19

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Has COVID-19 strengthened the case to use Cost-Benefit Analysis (hereafter CBA), including cash values assigned to lives? CBA derives from utilitarian economics. Utilitarianism's weaknesses have been noted and attempts made to refine its application to economics. The Christian worldview implies an immense value should be placed on every human life. A theological economics would almost certainly critique key assumptions underpinning utilitarianism and hence of CBA. This article seeks to show that this need not mean a ban on use of CBA. We suggest, particularly in the context of COVID, that CBA, including valuations or exchange values for a life, can be used subject to ethical constraints. While this analysis yields ambivalent results as to the cost-benefit outcome for "large scale" policy responses, such as national lockdowns, "smaller scale" policies, such as masks, vaccination, and incentives to be vaccinated, may more likely produce net benefits.[1]

Introduction

In August 2020 the influential UK journalist Matthew Parris claimed that not only were government lockdown policies excessively damaging given costs outweighing the benefits, but that those "bad" policies derived ultimately from the Judeo-Christian belief that human beings were of infinite value, having been created in God's image.[2] This article does not consider whether Parris was right to "blame" (or praise!) a residual Christian influence. This article uses the perspective of Christian theology to critique a contrasting approach to COVID: Cost-Benefit Analysis (CBA). Such a CBA approach, with values assigned to

lives saved, has attracted growing support amongst economists, but there have been few if any critiques of CBA applied to COVID from the perspective of theological economics.

Arguably, the pandemic represented a massive dilemma for policymakers.[3] Should they prioritize reduction in infection even if this meant closing down much of the economy? Or should they keep the economy open especially given the link between economic livelihood to health? This article considers how far economics, specifically the use of monetary value for human lives saved, assists in making what have been called tragic choices, where all the options involve suffering and deaths.

I accept the case made by Paul Oslington and Robert Tatum that there should be a theological economics,[4] that is, an economics critiqued by theology, specifically Christian theology. Two crucial inputs from that theology into theological economics are revelation (Scripture, the Bible[5]) and Christian tradition. Whatever may have been true in the earlier development of economic thinking, over the last one hundred years or so the discipline has become highly secularized. In this article we contrast secular economics, especially its utilitarian basis, with theological economics. The focus is on the United Kingdom, but much of the analysis has wider relevance.

During the public health emergency and associated economic crisis in 2020 and 2021, in the United Kingdom, it was suggested by a number of economists that a monetary value should be assigned to the lives saved by government policies.[6] According to this view, giving the lives saved a cash value was the best way of ensuring that such policies were efficient[7] and equitable.[8]

Secular economics wrestled with the question as to the best response to the threat to human lives and economic livelihoods posed by COVID. That economic approach should itself be critiqued. Our conclusion is that full-blown utilitarian economics and CBA in particular cannot give a definitive answer to the question, "What should government do in the COVID-19 crisis?" That said, if used judiciously they may be useful tools and, especially given that they highlight key economic concepts such as opportunity cost and trade-offs, can usefully inform decision making.

Economics' Utilitarian Base

Consideration of CBA including the valuation of life cannot avoid reference back to the utilitarian roots of CBA, but the overview here must be brief.

In the nineteenth century, economists began to develop models of economic behavior such as rational economic man: *homo economicus.* That model relies

on the following fundamental assumptions or axioms: (1) non-satiation (a higher level of consumption was always preferred to less), (2) rationality (consistency) in decision making, and (3) preferences were entirely self-interested.[9]

About the third axiom, the economist F. Y. Edgeworth said that "the first principle of economics is that every economic agent is activated only by self-interest."[10] There was to be considerable debate and flux within the discipline over the next 150 years or so, notably as to which type of utility was being considered and whether utility could be measured.[11] Nevertheless, economists to a great extent adopted Bentham's pleasure principle whereby we desire to maximize pleasure and minimize pain.

Even within secular economics there have been powerful criticisms of such heavy reliance on utilitarianism. Amartya Sen is a prominent critic. He argued that utilitarian economics requires assent to three principles, all of which can be questioned:[12]

1. Only consequences count, the actions which lead to consequences have no value in themselves.
2. The consequences which follow on from actions can be evaluated on their own without any need to use rules of conduct.
3. All considerations can be excluded except for the selfish preferences of individuals.

The challenges facing utilitarian economics increase as one moves from one individual to apply Bentham's calculus to an entire society or economy. Within economics the specialism of welfare economics usually assumes there is a Social Welfare Function (hereafter SWF) whereby for any given state of the world the various utilities of each individual can be added together. Sen, following Kenneth Arrow, noted that construction of a viable and realistic SWF is highly problematic.[13] What about differential distributional impacts? Various states of the world produce various winners and losers, so how does one allow for that? Welfare economics is very individualist rather than paternalistic in that it assumes individuals are always the best judges of their interests. Is that so?

There have been many attempts to refine the utilitarian base of economics and in particular deal with the three areas of weakness identified by Sen.

In terms of "only consequences matter," J. S. Mill commented that it was better, "to be Socrates dissatisfied than a fool satisfied."[14] He recognized that it might be necessary to go beyond a crude measure of "pleasure." The Benthamite pleasure principle focuses on the immediate pleasure versus pain choice to an extent that obscures ongoing human personality with some sense of a past and a future.[15]

In terms of the value of rules, there has been an attempt to develop "rule utilitarianism" whereby the competition is between rules rather than acts as to which maximizes utility.[16]

In terms of moving beyond the selfish preferences of an individual, Sen suggested that people are often characterized by commitment: willingness to contribute to support the general well-being. Sen's commitment sounds similar to an older idea in economics, one suggested by Adam Smith, that people often do display "sympathy" with others.[17] My utility depends not only on the outcome from my point of view but also on how well others are doing. J. C. Harsanyi's equiprobability of utility might be considered to imply the same results as sympathy. The individual gives equal weight to her utility and the utility of the other person perhaps because she is confronted by a veil of ignorance as to which person she actually is.[18]

There have thus been great efforts to try to refine utilitarian economics, but it is unclear how much has changed in practice. Mill notwithstanding, the models actually used by economists still tend to emphasize maximization of the individual's level of consumption measured in monetary terms. The application of rule utilitarianism faces major challenges: (1) if the set of rules is adhered to in all circumstances, it may be possible to imagine a set of circumstances where that will imply a reduction in utility; and (2) if it is allowed that the rules can be broken in exceptional circumstances do we not end up with act utilitarianism again? As for Harsanyi's equiprobability approach, how useful is the fiction of the veil of ignorance?[19]

As regards moving up to the SWF, I. M. D. Little argued it could be thought of as the value judgements of how society should be, but which (and whose) value judgements might be selected?[20] Additionally, there may not be a complete and stable ranking of the social value of the various states of the world.[21]

Cost-Benefit Analysis as a Policy Evaluation Tool

CBA is a practical application of the utilitarian approach in economics.[22] It is an attempt to use a systematic approach to evaluating policy options in terms of comparing the benefits minus the costs of each of those actions. For example, in a recent review of 115 major US Federal regulations, 70 percent of the total benefits were attributable to the monetized value of a reduction in early mortality.[23] Given that CBA is a policy application of utilitarian economics, all of the criticisms that have been made already apply. Questions arise particularly as to how far CBA can successfully compare costs and benefits which relate to different individuals or groups across society.[24]

There has also been concern whether the standard technique of discounting future monetary values using some assumed interest rate provides an adequate basis to compare, for example, a cost which is realized in, say, 2021 with a benefit that occurs in 2030.[25] It might also be asked whether one is sometimes confronted with some costs or some benefits that cannot readily be converted into a cash value: Human life could be a notable example.

Can or Should We Monetize Human Life?

Secular economics has recognized this is challenging. There is a variety of possible ways of estimating the money value of a life, and the results range widely.[26] One procedure within the wider Willingness to Pay (WTP) approach is the Value of a Statistical Life (hereafter VSL). In VSL, strictly speaking, we are not measuring the value that, say, government does/should put on a life saved but rather how much money individuals would be willing to pay to "buy" a small reduction in the risk of death.[27] If those amounts of money are summed over a large population then we can perhaps estimate the VSL for one life.

Proponents of VSL admit there are major challenges. VSL is most appropriate to measuring the value of *small* changes in risk. In the case of COVID-19 for some groups in society the change in risk was probably substantial. When that is so it is possible that the amount of monetary compensation which would have to be given to those groups to accept the increase in risk could be substantially greater than their WTP to reduce that risk.[28] Additionally, the benefits and costs of COVID-19–associated lockdowns, and indeed the balance of costs and benefits, tend to be distributed differently by age and income group and it remains unclear how reliably the VSL estimates can be adjusted to allow for such distributional effects. Adler argues very high VSL values may be inappropriate for assessing COVID-19 policy, especially if the cost impact of lockdowns falls disproportionally on the less well off.[29]

As an alternative to WTP/VSL, an approach based on production or earnings is sometimes preferred. In this case, a life is worth what would have been contributed to GDP or what the person would have earned.[30]

Does COVID-19 Require Valuation of Lives Saved?

The description "unprecedented" has been much used in the context of the pandemic and its impact. During 2020 we had a severe recession in the United States, United Kingdom, and much of the world[31] alongside a very unusual public health response—lockdowns or severe restrictions relating to economic and

social life across many countries, albeit in the United States policy varied at the state level. The likelihood is that the lockdowns caused much but not all of the recessions.[32] The lockdown policies probably also saved a considerable number of lives. Virologists have tried to model what would have happened in the absence of restrictions and from that counterfactual number one can subtract the actual COVID-19 mortality to imply an estimate of the lives saved.

As the pandemic, lockdowns, and recessions developed, some economists, particularly in the United Kingdom, criticized this response:[33]

- Government seemed to be relying largely on advice from virologists and medics plus some behavioral scientists and sociologists. In the UK the focus of attention was the advisory body SAGE (Scientific Advisory Group for Emergencies), which as of late 2020 included no economists.[34]
- The imperative to save lives is in the professional DNA of medics. This could imply SAGE will always argue for policies to reduce COVID-19 without giving much, if any, consideration to the economic and social costs that might follow.
- Economics, in contrast, considers opportunity cost and trade-offs.[35]
- More specifically, it was claimed, economics provides the tool in terms of CBA, including valuation of life (more particularly years of life) to judge whether the COVID-19 policies had been associated with a disproportionate economic cost.
- It was argued that use of CBA would reduce the likelihood that policy makers would be prey to the identifiable victim problem. Jessop illustrates how that problem comes about: Those with COVID-19 in an intensive care unit can be "seen" whereas the woman who will die of a heart attack in 2021 after losing her job during the 2020 lock down recession cannot be so readily seen. Policy makers may be more likely to be moved to help the former rather than the latter. Unless, that is, CBA constrains them to give some consideration to the less-visible victims of policies.[36]

Table 1 contains my worked-out example of CBA applied to the pandemic in the UK context. As an aid to considering the sensitivity of the results I spell out how assumptions might either under- or overestimate benefits or costs:

Table 1

CBA Estimates Relating to the Lockdown Policies in the UK during the First Wave of COVID-19, i.e., March–June 2020

Benefits	Costs
Years of life saved: • 250,000[37] minus 54,500[38] = 195,500 • That times the average expected years of additional life (7.5)[39] = 1,466,250 • That times a value of £60,000 per QALY[40] = £88bn = (QALY: Quality Adjusted Life Years)	Loss of GDP associated with the lockdown which occurred during the first wave of COVID-19 (assuming three-quarters of the decline in GDP in 2020 could be attributed to that lockdown)[41]: • 3/4 of 9.8% of the 2019 GDP of £2,172.5bn[42] = £159.7bn
Assumptions which may over-estimate the benefit	
• The Neil Ferguson (Imperial College London) counterfactual as to the number of deaths in the absence of lockdown may be too high.[43] • That each life saved would, on average, have 7.5 years of additional life expectancy. Many (most?) COVID-19 victims were suffering from other, chronic conditions, so a lower number might be plausible. It is sometimes argued that those with substantial co-morbidities should be assigned a lower utility value for each year: The years of life become quality-adjusted, hence QALYs. For ethical aspects of such a procedure see below. • Use of HM Treasury's £60,000 value for one QALY rather than the £30,000 implied by the practice of the National Institute for Health and Care Excellence (NICE).[44]	
Assumptions which may under-estimate the costs	
• No allowance for lives lost if a very high and uncontrolled rate of COVID-19 infection overwhelmed the capacity of the healthcare system. One estimate for the loss in that scenario was about 1,000,000 people.[45] This very alarming result was deemed a "Reasonable Worst Case" scenario in terms of fatalities/infections based on the data available during the earlier phase of the pandemic. Later data suggests that scenario was too pessimistic. • No allowance for the welfare impact if there had been a higher level of COVID-19 infection and hence a greater prevalence of "long COVID," i.e., those who recover in part but continue to suffer various debilitating symptoms for months or years thereafter.	

Assumptions which may over-estimate the costs
• That three-quarters of the GDP loss can be attributed to the lockdown associated with the first wave as opposed to the impact of restrictions which happened later in the year. Given data on output trends within various economic sectors it does seem plausible that more than half of total loss across the year occurred during the first lockdown (a substantial proportion of construction and manufacturing activity shut down during March–June 2020 and the reduction in activity in the final months of the year was much lower, but perhaps the proportion should be less than three-quarters).
Assumptions which may under-estimate the costs
• That the GDP cost was only in 2020. There may be a cost in later years: (a) lasting scars reducing the growth rate in subsequent years, and (b) it is very likely that GDP in 2021, 2022, etc., will be less than the level which would have been attained if growth had continued at its pre-March 2020 trend. • Abstracting from most of the potential long run social costs, notably in terms of reduced quality and quantity of education services provided during the lockdowns.[46]

This CBA exercise is tentative, but for what it is worth, a number of conclusions might be drawn:

- The value of the benefits and the value of the costs are very large numbers.
- Much uncertainty attaches to both sets of figures given the assumptions.
- If the assumptions are reasonable, it looks like the monetary value assigned to costs exceed those relating to benefits: Table 2 indicates some earlier CBAs produced a similar conclusion and where they did not there are reasons to doubt that conclusion.
- A consideration of the assumptions could lead to the conclusion that the margin in favor of the costs relative to benefits should be even larger. Perhaps the only set of circumstances in which the measured benefits would exceed costs would be if it is assumed lockdown prevented an upsurge in cases that would have been so large that the healthcare system would have been overwhelmed, leading in turn to deaths on a massive scale.

Table 2 How This CBA Compares to Earlier Studies		
	How it compares to my results in Table 1	Possible explanation for the differences
Miles, Steadman and Heald (2020)[47] (UK)	Similar in terms of costs implied to be much greater than benefits	
Richard Layard et al (2020)[48] (UK)	Different in terms of benefits exceeded costs	Assumed the benefit per QALY was many times higher than the value used by NICE
Robert Rowthorn and J. Maciejowski[49] (UK)	Similar in terms of costs implied to be much greater than benefits	
James Broughel and M.Kotrous (2021), a study of the spring 2020 State level lockdowns[50] (US)	Different in terms of benefits exceeded costs	Assumed loss of output "cost" could be estimated as number of days of mandatory shut down times average daily output. This assumes a rapid bounce back to "normal" output thereafter, which may not have happened.

But just because a CBA *can* be done, *should* it be done? To answer, we turn to the moral and indeed theological critique of CBA including the valuing of life.

Theological Economics, Utilitarianism, and Cost-Benefit Analysis

I agree with Tatum that there are benefits to the practice of economics, not just for methodology but also for the identification of what should be important to policy makers, if we use theological economics.[51] Theological economics, "is positioned, relativized and criticized by theology."[52] As Tatum argues, a theological examination of human nature might (or might not, given our fallen nature) lead to alternative frameworks to utility maximization that have better explanatory power.[53] Tomáš Sedlácek argued we should think in terms of the maximization of the "good" with utility being a subset of that.[54] This could be consistent with Jesus' instruction that we should love our neighbor as we love ourselves

(Matt. 22:39; Mark 12:31). In fact, according to Sedlácek, such is the emphasis on God's Law in the Hebrew scriptures that we could think of economic behavior as maximization of utility subject to the Law.

My emphasis here is on Scripture, that is, the Bible, as a basis for a theological economics. Of course, there are other potential sources such as natural law and/or Catholic social teaching and especially the assertion that there could be a common good rather than just the sum of each individual's good.[55] Interestingly, the Bible quite often uses language relating to the value of life or what we might exchange for a life. A selection of examples follows:

Table 3
Biblical References to Value of a Life or the Exchange Value of a Life

Every life of immense value
"Look at the birds of the air: they neither sow nor reap nor gather into barns, and yet your heavenly Father feeds them. Are you not of more value than they?" (Matt. 6:26; cf. Mark 8:36–7; Ps. 49:7)
A precise (monetary) value of a life is not identified but there is an emphasis that every human being is of immense value/worth in the sight of God.[56] The salvation of our immortal souls cannot be bought through an economic transaction.
That worth derives from our creation in God's image
"Then God said, 'Let us make man in our image.'" (Gen. 1:26)
The implication of human beings bearing God's image.
It is wrong to place a market value on human beings for the purposes of slavery or betrayal
"Then Midianite traders passed by. And they drew Joseph up and lifted him out of the pit, and sold him to the Ishmaelites for twenty shekels of silver." (Gen. 37:28; cf. Matt. 27:3)
Examples of "very bad practice," reducing life to a cash sum as part of enslavement or betrayal.
Sometimes, for practical purposes, the Bible does allow an exchange value to be placed on a life.
"[I]f anyone makes a special vow to the LORD involving the valuation of persons, then the valuation of a male from 20 years old up to 60 years old shall be 50 shekels of silver." (Lev. 27:2b–3a, cf. vv. 4–8; Genesis 9:5; Num. 35:31–32)
Individuals could be bought out of vows using a finite sum of money. In the case of murder, the life of the guilty could legitimately be taken given the innocent life lost, but ransom payments were not allowed.

When you have tragic choices, government should opt for the least loss of life

"And the LORD spoke to Gad, David's seer, saying, 'Go and say to David, "Thus says the LORD, Three things I offer you; choose one of them, that I may do it to you."' So Gad came to David and said to him, 'Thus says the LORD, "Choose what you will: either three years of famine, or three months of devastation by your foes while the sword of your enemies overtakes you, or else three days of the sword of the LORD, pestilence on the land, with the angel of the LORD destroying throughout all the territory of Israel." Now decide what answer I will shall return to him who sent me.' Then David said to Gad, 'I am in great distress. Let me fall into the hand of the LORD, for his mercy is very great, but do not let me fall into the hand of man.'" (1 Chron. 21:9–13)

Having provoked God's anger through conducting a population census (probably motivated by a presumptuous faith in his military strength), King David is presented with a punishment trilemma. David opts for his land to be punished directly by God since there is the greatest likelihood that some mercy will be shown. When all policy options will lead to loss of life, government can and perhaps should opt for the path which leads to the least loss of life.[57]

Utilitarian calculation did not legitimize a massive miscarriage of justice

"[I]t is better for you that one man should die for the people, not that the whole nation should perish." (John 11:50)

The Apostle John's account of the Caiaphas' justification for putting Jesus to death on the cross looks like an implied criticism of utilitarian calculation. John was not consciously debating a moral theory which would only be fully developed 1800 years later,[58] but it remains striking that the chief priest said this about history's worst miscarriage of justice.[59]

Any implications from the Christian doctrine of atonement to valuing human lives?

"For even the Son of Man came not to be served but to serve, and to give his life as a ransom for many." (Mark 10:45; cf. Rom. 6:23; 2 Cor. 5:21)

Christ's death on the cross achieves a great exchange: his perfect life for our sins. Something of infinite value, God's only Son, was sacrificed to secure the salvation of a finite number of human beings (cf. Isa. 53:6, 12; Rom. 3:24–25). It might appear God was placing an infinite value on each of those men and women.[60] We do need to be cautious; any "necessity" of the atonement was driven by the nature of God's holiness and the nature of sin rather than the worth of human beings.[61]

How Far Should We Use Cost-Benefit Analysis?

There are a number of parts to the argument in this section:

1. Reject an outright prohibition on use of CBA.
2. Recognize scarcity as inherent in the (fallen) human condition.
3. Recognize that sometimes the valuation of human life has had horrendous moral consequences.
4. Recognize a twofold reality with respect to valuing human life: (a) an ultimate sense of infinite value, given our creation in God's image, and (b) a practical sense of finite value in everyday life.
5. Apply ethical screening to the use of CBA.
6. It may be morally acceptable to allow for the longevity effects of various healthcare interventions, but it is not morally acceptable to place a lesser weight on the benefits received by those who are likely to have a lower number of *quality adjusted* life years.
7. CBA may be most useful when used to evaluate "smaller scale" policies relating to COVID-19.

1. Reject an Outright Prohibition on Use of CBA

Donald Hay argues that economics must be subjected to a Christian critique and also for a complete prohibition on putting a cash value on a human life.[62] Choices about whether or not to save lives cannot be put on level with, say, a decision about whether to buy an expensive car. Similarly, the medical ethicist John Wyatt warned, "If we as a society allow the monetary cost of caring to dominate our thinking, we will turn away from Christian ideals."[63]

Such a complete ban on CBA valuing of life is problematic both practically and theologically. In practical terms we often value human lives short of the infinite. We could save more human lives each year if we allocated, say 50 percent of GDP to health spending instead of the 10–15 percent found in most Western countries. We choose not to do so, perhaps because we judge the cost to outweigh the benefits.

A theological objection to a prohibition on the use of CBA is implied by some of the biblical references given in table 3. The biblical answer to the question, "Is it legitimate to place a value on a human life?"[64] could be, "It depends on the context." The Bible suggests an infinite value should be placed on our salvation: our faith is so precious that we should never renounce it even if the consequence is our physical death (cf. Matt. 10:28). That implies a lesser value being placed

on *this life* so, sometimes, a life has a finite value. The Old Testament provision for buying out vows indicates this.[65]

2. Recognize the Existence of Scarcity

Tatum argues correctly that secular economics is mistaken if it claims scarcity is *the* fundamental human problem.[66] Nevertheless, scarcity, opportunity cost, and tradeoffs are realities that confront public and private choices about resourcing health care. CBA recognizes these realities.[67] The medical ethicist Wyatt concedes that, "We cannot ignore the ever-spiraling cost of health care," and hence some form of rationing of health care resources is inevitable.[68]

3. Sometimes the Valuation of Life Has Had Horrendous Moral Consequences

While rejecting outright prohibition, the use of CBA including exchange values for life should be done judiciously. This is partly because of historical examples where human lives were valued with disastrous consequences. Perhaps the most obvious morally egregious case was the original US Constitution where, for the purposes of comparing the population of the states so as to determine number of representatives in the House of Representatives and contributions to federal taxes, a slave was deemed to be equal to three-fifths of a free person.[69]

A further warning example could be attempts to justify eugenic policies in terms of resources saved. Francis Schaeffer noted a Nazi-era German mathematics textbook that asked pupils to work out how many houses might have been built with the money otherwise "wasted" on the care of those with disabilities.[70] Schaeffer further noted how in 1977 it was claimed in the United States that an abortion would cost $150.00, whereas the cost to the taxpayer of an "unwanted child" would be $2,500.[71] In the early 1990s, one study in the *British Medical Journal* concluded that the estimated total cost of antenatal screening to "avoid" the birth of a baby with Down's Syndrome was £38,000, but that this was, "Substantially less than the costs of lifetime care, which were estimated in 1987 as £120,000."[72]

These examples do not speak against the method of CBA as such but against the way it has sometimes been applied.

4. The Twofold Reality of the Value of Human Life

In the context of creation in God's image our life is of infinite worth. But at another level, particularly in terms of decisions made at the margin, such as whether we commit a little bit more time to work or leisure or praying, there are economic exchange values such as the value of an hour of time (the wage rate)

determined by scarcity. In an ultimate sense a Christian might say that time spent in prayer is of infinite worth but at the margin the economic value of that time relates to the wage rate.

5. Apply Ethical Screening

What I am suggesting here is that CBA can be used if it is subject to ethical constraints or ethical screening. Such an approach was implied by the medical ethicist Wyatt when he outlined six basic principles relating to how decisions about healthcare resources might be made:

a. The rationing of healthcare should be done in an open and transparent manner allowing public debate and democratic challenge.
b. Practical concern for the weak and vulnerable should be expressed.
c. We should avoid inequalities based on social, racial, or geographical divides.[73]
d. We should resist a reductionist economism that measures costs and benefits in purely financial terms.[74]
e. Healthcare should be provided according to effectiveness and need rather than any sense of fault.[75]
f. We need to encourage realism about how much can be achieved by healthcare in a flawed world where resources and knowledge are limited.

These principles are useful if sometimes hard to operationalize, especially in the case of principle (d). In terms of principle (c) and the avoidance of inequalities, as a safeguard against the immoral use of CBA all lives are valued equally regardless of racial/ethnic background.[76]

6. Valuation Allowing for Longevity Effects but Not Other Quality Aspects

What then of the use of CBA including QALYs, that is, the attempt to estimate the benefits in terms not of the number of lives saved but the number of *years of life* saved? I judge that within certain limits this is acceptable. It is a "given" that policy interventions that impact mainly on the old will "yield" fewer added years of life than policies impacting on the young. Policymakers should at least be aware of such differences in the impacts of the various policy options. That

should not be taken to imply that all interventions to help the elderly should be stopped per principle (b) above.

More problematic is the "Q" (quality) within QALY as this implies that the CBA practitioner can accurately measure the quality of life of someone who is, say, blind or an amputee compared to a healthy person. Beaudet et al. report some perhaps rather too precise quality of life utility factors for various conditions such as 0.79 for type 2 diabetes. That would imply a year of life for a person with diabetes was "worth" about four-fifths a healthy year of life.[77] This leads back into the debates in nineteenth-century economics as to whether it was at all meaningful to make inter-personal comparisons of utility.[78] Just as CBA should not be used in such a way as to imply a simple agenda to the policy maker as to how to deal with different age groups, so the same applies in terms of the differential impacts on people with varying states of health.[79]

7. Cost-Benefit Analysis Best Applied to "Smaller Scale" COVID-19 Policies

A further important consideration is that while CBA is certainly relevant to "big scale" policies such as lockdowns, CBA could also be used to consider apparently "smaller scale" responses. The latter could include various degrees of social distancing and mask wearing (whether voluntary or mandatory) as well as vaccination or provision of incentives to encourage vaccination.[80] Such "lesser" policies have received much less attention in terms of CBA, but to the extent that in such cases some of the costs (notably in terms of consequent reduction in GDP) and benefits may be identifiable with less uncertainty, then the results could be more reliable. In making any such CBA, we do face the problem that the virologists and others have not so far projected, for example, how many lives might be saved through, say, mask wearing, although there have been some attempts to project the lives saved through vaccination. That said, such lesser measures are very unlikely to be associated with the scale of GDP reduction related to national lockdowns. The challenge would then be to quantify the costs in terms of, say, the inconvenience to mask wearers and any reduction to GDP through reduced activity in service sector activities where mask wearing discouraged some customers. The likelihood is that even with a modest VLS applied as the benefit in terms of lives saved, implied benefits will outweigh the costs.[81]

Conclusion

To the extent that economics cannot give a simple, precise, and definite answer to the question as to the appropriate government response to COVID-19, this might disappoint some. Steven McMullen, in commending US economists for largely *not* resorting to CBA regarding COVID-19, makes the valid point that the potential danger of CBA is precisely that it could make complex moral choices appear simple.[82] That said, it is a tool that could usefully assist such choices.

Doing the right thing, governing righteously, is always going to be very challenging and especially during a pandemic (once again, see 1 Chron. 21:9–13). What the standard tools and analysis of economics can do is provide some useful information about the costs and effects of various policy options. Such information helps to *inform* government decisions, but it *cannot* by itself *make* such choices.[83]

Some CBA estimations do imply that the costs of lockdown very likely outweigh the benefits. However, if those calculations include the scenario where there is a very heavy loss of life given an overwhelming of the healthcare system then the opposite conclusion may emerge.

CBA could perhaps be more reliably applied to smaller scale policy changes—such as the degree of social distancing or the use of face masks or vaccines. And in these cases, the indicated benefits are more likely to outweigh the costs.

Notes

1. I am very grateful for the many very useful suggestions I received from Michael Pollitt, Patrick Roche, Robert Tatum, Roselle Ward, and two anonymous referees.

2. See Matthew Parris, "We Can, and Must, Put a Price on Human Life," *The Times*, August 8, 2020, https://www.thetimes.co.uk/article/we-can-and-must-put-a-price-on-human-life-p9m3z50jp. The article's subtitle is "The Pandemic Has Brought into Sharp Focus the Question that Christians Have Been Encouraging Us to Dodge for Centuries."

3. Admittedly, in the long run health and wealth can go together, but in the short to medium run there probably are trade-offs. I am making two assumptions: (1) that lockdowns do contribute to causing recessions (for which there is very strong evidence) and (2) that lockdowns are effective in reducing the spread of the virus. The evidence for the latter is less overwhelming but still strong. Notwithstanding some contribution from "voluntary" social distancing and/or acquired or inherent immunity, one study concluded it remained very likely that lockdown played some role. See David Miles, Mike Stedman, and Adrian Heald, "Living with COVID-19: Balancing Costs against Benefits in the Face of the Virus," *National Institute Economic Review* 253 (2020): 61–76. Similar conclusions might be drawn from differential outcomes across the Nordic countries where Sweden's absence of a national lockdown was conspicuous. See J. Martin, L. H. Conyon, and S. Thomsen, "Lockdowns and COVID-19 Deaths in Scandinavia," *COVID Economics* 26 (2020): 17–42.

4. See Paul Oslington, "A Theological Economics," *International Journal of Social Economics* 27, nos. 1–2 (2000): 34; Robert Tatum, "A Theology of Economic Reform," *Faith & Economics* 69 (Spring 2017): 63–83; Robert Tatum, "*Homo Economicus* as Fallen Man: The Need for Theological Economics," *Journal of Markets & Morality* 20, no. 1 (2017): 127–40.

5. All biblical quotations are from the English Standard Version (ESV).

6. See Julian Jessop, "Coronavirus and the Economic Value of Human Life or … Is the Lockdown Worth It?" *Briefing* 8 (London: Institute of Economic Affairs, June 2020); Paul Ormerod, "Turning a Blind Eye: Have Economists Been Ignored During the Pandemic?," *Omerod Paper* 2 (London: Institute of Economic Affairs, May 2021).

7. The number of resources being used up by such policies was neither too much nor too little.

8. Potential victims of COVID-19 were neither treated more generously nor less generously than the rest of the population.

9. "Self-interested preferences" means here that when I am comparing two states of the world, all that concerns me is whether I will have more or less to consume in one

state compared to the other. The position of other individuals in those two states is of no interest to me.

10. F. Y. Edgeworth, *Mathematical Psychics: An Essay on the Application of Economics to the Moral Sciences* (London: Kegan Paul, 1881).

11. In principle there is cardinal utility: absolute quantities of utility. Many economists came to the conclusion that cardinal utility could not be measured. They defaulted to ordinal utility where the critical distinction is not between amounts but between more or less. See John R. Hicks, *A Revision of Demand Theory* (Oxford: Oxford University Press, 1956).

12. Amartya Sen, "Rational Fools: A Critique of the Behavioural Foundations of Economic Theory," *Philosophy & Public Affairs* 6 (1976–77): 317–44. Summarized in Donald Hay, *Economics Today: A Christian Critique* (Leicester: Apollos; Downers Grove: InterVarsity Press, 1989).

13. See Amartya Sen, "Personal Utilities and Public Judgements: Or What's Wrong with Welfare Economics?" *Economic Journal* 89 (1979): 537–58.

14. J. S. Mill, *Utilitarianism* (London: Parker, Son and Bourn, 1863), chap. 2.

15. Why would a pure Benthamite hedonist make any provision for the future? Some economists dispute that there is a problem. They think they can model individuals' preferences both in the present and in the future. There certainly is an intergenerational challenge. How far and in what ways do we allow for the undoubted preference which some self-interested maximizers have to save to fund not only their own future consumption but also the consumption of succeeding generations?

16. See R. F. Harrod, "Utilitarianism Revised," *Mind* 45 (1936): 137–56.

17. Sen's commitment may go further than sympathy. It includes a willingness to actually pay the taxes to fund things such as public goods or a national welfare system. These may promote the general good without necessarily bringing a direct benefit to the individual concerned.

18. See J. C. Harsanyi, "Morality and the Theory of Rational Behaviour," *Social Research* 44 (1977): 633.

19. Although some might argue the practice of CBA is a sort of proxy for evaluating options from behind the veil of ignorance.

20. See I. M. D. Little, "Social Choice and Individual Preferences," *Journal of Political Economy* 60 (1952): 422–32.

21. This is a reference to Arrow's Impossibility Theorem. See Kenneth J. Arrow, "A Difficulty in the Concept of Social Welfare," *Journal of Political Economy* 58, no. 4 (1951): 328–46.

22. One commentator stresses the gap between utilitarianism and CBA but concedes they are both consequentialist. See Matthew Adler, "What Should We Pay to Save Lives in a Pandemic? A Critique of the Value of Statistical Life," *COVID Economics* 33 (2020): 1–45.

23. See OMB, *Report to Congress on the Benefits and Costs of Federal Regulations and Unfunded Mandates on State, Local and Tribal Entities* (Washington, DC: Office for Management and Budget, 2013).

24. In the 1930s the economists Hicks and Nicholas Kaldor suggested a compensation test to deal with any distributional effects: A change could be justified if the winners gained more than the losers lost even if no compensation payment is actually made.

25. See David L. Weimer and Aidan R. Vining, *Policy Analysis: Concepts and Practice* (New York: Routledge, 2017).

26. See Jessop, "Coronavirus and the Economic Value of Human Life or … Is the Lockdown Worth It?"

27. For a good summary, see L. A. Robinson, "On Balance: COVID-19 Benefit-Cost Analysis and the Value of Statistical Lives," *Society for Benefit-Cost Analysis*, July 1, 2020, https://www.benefitcostanalysis.org/index.php?option=com_dailyplanetblog&view=entry&year=2020&month=06&day=3 0&id=53:on-balance-covid-19-benefit-cost-analysis-and-the-value-of-statistical-lives.

28. The general point is that when changes in risk are substantial the "willingness to accept" (the amount of cash to compensate for risk) may well be substantially greater than the WTP. See J. Colmer, "What is the Meaning of (Statistical) Life? Benefit-Cost Analysis in the Time of COVID-19," *Oxford Review of Economic Policy* 36, Supplement (2020): S56–S63.

29. See Adler, "What Should We Spend?"

30. As in the case of WTP, a life will be monetized to a higher value in a higher GDP per head country as opposed to the outcome in a poorer country. The values placed on a human life by various US agencies are sometimes about four to five times higher than those used in the United Kingdom. Compare Jessop, "Coronavirus and the Economic Value" to David M. Cutler and Lawrence W. Summers, "The COVID Pandemic and the $16 Trillion Virus," *Journal of the American Medical Association (JAMA Network)* 324 (2020): 1495–96.

31. Global GDP declined by about 3 percent in 2020, the UK 2020's GDP decline of 9.8 percent being considerably worse than the 3.5 percent in the United States (although some of this UK–US difference is exaggerated by the particular way in which the UK statistical authorities measured the level of GDP in the public sector). See IMF, *World Economic Outlook: Update* (Washington, DC: International Monetary Fund, July

2021); OECD, *Economic Outlook* (Paris: Organization for Economic Co-operation and Development, May 2021).

32. Lockdowns cannot be blamed for all of the recessions because a substantial amount (perhaps one-third/one-half) may have happened anyway given that rising infection rates and death toll would inevitably have produced much economic disruption and would also have been associated with increased precautionary behavior by consumers and workers: voluntary decisions to stay at home to stay safe even if legislation did not require them to do so. Studies do show a correlation between severity of restrictions and severity of recession. See IMF, *World Economic Outlook* (Washington, DC: International Monetary Fund, October 2020); OECD, *Economic Outlook Turning Hope into Reality* (Organization for Economic Co-operation and Development: Paris, December 2020).

33. See Ormerod, "Turning a Blind Eye." In an interesting contrast, Steven McMullen commends economists, presumably mainly in the United State, for the reserve they have shown in *not* recommending the use of CBA. See "Editorial," *Faith & Economics* 75 (Spring 2020): 3–6.

34. See "The Times View on Boris Johnson's Coronavirus Strategy: Sage Advice," *The Times*, October 16, 2020, https://www.thetimes.co.uk/article/the-times-view-on-boris-johnson-s-coronavirus-strategy-sage-advice-2mp5dpcnr.

35. Opportunity cost is the amount of the next best good or service that must be sacrificed to consume a quantity of a chosen good or service. In the real world of scarcities opportunity costs are always with us. Trade-offs mean to get more of one good outcome, it is necessary to forgo more of some other good thing. Trade-offs are again a characteristic of a world in which our often-limitless aspirations outstrip our limited resources.

36. Jessop, "Coronavirus and the Economic Value."

37. This figure represents the projected number of deaths if only "voluntary" social distancing and other measures short of a national lockdown had been adopted. Neil M. Ferguson et al., "Impact of Non-Pharmaceutical Interventions to Reduce COVID-19 Mortality and Healthcare Demand," *Report 9* (London: Imperial College London COVID-19 Response Team, March 16, 2020), https://www.imperial.ac.uk/media/imperial-college/medicine/sph/ide/gida-fellowships/Imperial-College-COVID19-NPI-modelling-16-03-2020.pdf.

38. This figure represents deaths where COVID-19 was mentioned on the death certificate March–June ONS, "Deaths Registered Weekly in England and Wales, Provisional," *Statistical Bulletin* (Newport: Office for National Statistics, December 15, 2020).

39. This calculation takes the average age of those who died of COVID and then using the official estimate of remaining life expectancy. See ONS, "National Life Tables,

England and Wales," *Statistical Bulletin* (Newport: Office for National Statistics, September 24, 2020); ONS, "Average Age of Death (Median and Mean) of Persons Whose Death was Due to COVID-19 or Involved COVID-19, by Sex, Deaths Registered up to Week Ending 2 October 2020, England and Wales," *Answer to Freedom of Information Request* (Newport: Office for National Statistics, October 14, 2020).

40. See HM Treasury, *The Green Book: Central Government Guidance on Appraisal and Evaluation* (London: Her Majesty's Treasury, 2020).

41. See one estimate that was about half of the decline in employment in the United Kingdom and United States in the first half of 2020 was attributable to lockdowns. See S. Aum, S. Y. Lee, and Y. Shin, "COVID-19 Doesn't Need Lockdowns to Destroy Jobs: The Effect of Local Outbreaks in Korea," *CEPR Discussion Paper*, no. 14822 (London: Centre for Economic Policy Research, May 2020).

42. ONS, "GDP: Chained Volume Measures, Seasonally Adjusted £m," *Source Dataset* (Newport: Office for National Statistics, December 22, 2020).

43. For a critique of Ferguson's counterfactual, see Wouter Edeling et al., "The Impact of Uncertainty on Predictions of the CovidSIM Epidemiological Code," *Nature Computational Science* 1 (2021): 128–35, https://www.nature.com/articles/s43588-021-00028-9.

44. See David Buck, "Talking about the 'Return on Investment of Public Health': Why It's Important to Get It Right," *The King's Fund*, April 23, 2018, https://www.kingsfund.org.uk/blog/2018/04/return-investment-public-health. See also Subhash Pokhrel, "Why Standard Ways of Valuing Health Were Set Aside during the Pandemic," *The Conversation*, June 9, 2021, https://theconversation.com/why-standard-ways-of-valuing-health-were-set-aside-during-the-pandemic-153222.

45. See HSC, ONS, GAD, and Home Office, *Direct and Indirect Impacts of COVID-19 on Excess Deaths and Morbidity: Update* (London: Health and Social Care Department, Office for National Statistics, Government Actuary's Department and Home Office, 2020). A previous *ex post* CBA similarly did *not* factor in a value for the lives saved by avoiding an overwhelmed healthcare system. See Miles, Stedman, and Heald, "Living with COVID-19."

46. In terms of the possible cost with respect to non-COVID aspects of health (e.g., fewer cancers identified, less surgery) my judgement is that a lot of the disruption to the United Kingdom and other European healthcare systems would have happened anyway even if lockdown policies had not been adopted. A possible criticism of the approach taken by Miles, Stedman, and Heald, "Living with COVID-19" is that they seem to imply most of the reduction in non-COVID healthcare was the result of the lockdown policy rather than something inherent to any pandemic.

47. Miles, Stedman, and Heald, "Living with COVI-19."

48. See Richard Layard et al., "When to Release Lockdown: A Wellbeing Framework for Analysing Costs and Benefits," *CEPR Occasional Paper* 49 (London: Centre for Economic Policy Research, 2020). A problem with their valuations is that they would imply the UK should allocate much more than 10 percent of GDP to healthcare. This has not happened in practice, and it is not likely to happen.

49. See R. Rowthorn and J. Maciejowski, "A Cost-Benefit Analysis of COVID-19 Disease," *Oxford Review of Economic Policy* 36, Supplement (2020): S38–S55. That study argued that the benefits would only equate to the costs of a ten-week lockdown if a value of life (i.e., VSL) of £10m was assumed.

50. See J. Broughel and M. Kotrous, "The Benefits of Coronavirus Suppression: A Cost-Benefit Analysis of the Response to the First Wave of COVID-19 in the US," *PLoS ONE* 16, no. 6 (June 3, 2021), https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0252729.

51. See Tatum, "A Theology of Economic Reform."

52. Oslington, "A Theological Economics."

53. See Tatum, "A Theology of Economic Reform."

54. See T. Sedlácek, *Economics of Good and Evil: The Quest for Economic Meaning from Gilgamesh to Wall Street* (Oxford: Oxford University Press, 2011).

55. See the various Papal Encyclicals with a social emphasis such as *Rerum Novarum* in 1891 through to *Caritas in Veritate* in 2009.

56. This is obviously underpinned by the doctrine of humanity's creation by God in his image (Gen. 1:26).

57. We may not be comfortable with the recognition that policymakers face and make such choices in peace time but they are very obvious in wartime: Orders are given that convoys must not stop to pick up survivors if a ship is sunk because stopping would place even more lives in peril.

58. Among other things, John was pointing to the enormous irony that Caiaphas was being prophetic in a way he could not understand. Jesus was going to die for the sake of his people to save them from their sins.

59. Some might discern an apparent moral contradiction in that this text implies a condemnation of Caiaphas's action whereas 1 Chronicles 21:9-13 implies praise for David's choice about weighing up lives lost (see above). A possible resolution of this is that Caiaphas's action was really motivated by an attempt to preserve his personal power base. It was not the disinterested choice of the "least worst option."

60. In this context it does not matter which view of the extent of the atonement one accepts. Whether it is so-called "limited or particular" atonement (i.e., Christ died for the limited and known number of God's elect) or unlimited, it is still an infinite value divided by a finite number of human beings. Hence, infinite value per person! For development of the doctrine of the atonement, see Gerald Bray, *God Has Spoken: A History of Christian Theology* (Nottingham: Apollos; Downers Grove: InterVarsity Press, 2014): 894–97, 899–920.

61. Notwithstanding that we do need to be very careful in moving from the doctrine of the atonement to possible economic implications, some commentators have argued that Christians who subscribe to a penal substitution or propitiation view of atonement are more likely to accept a retributive view of social and economic justice rather than one based on distributive justice. See G. F. de Leeuw, "Can the Market Save? An Intersection of Economy, Mimesis, and the Atonement," *Cross Currents* 64, no. 1 (2014): 3–29. See also Randall McGowen, Review of *The Age of Atonement: The Influence of Evangelicalism on Social and Economic Thought, 1795–1865* by Boyd Hilton, *Albion: A Quarterly Journal Concerned with British Studies* 21, no. 1 (1989): 129–31.

62. See Hay, *Economics Today*.

63. John Wyatt, *Matters of Life and Death: Today's Healthcare Dilemmas in the Light of Christian Faith* (Downers Grove: InterVarsity Press, 1989).

64. It may be better, as it is less pejorative, to talk about the appropriate exchange value for a life, i.e., what must be given up in exchange for it.

65. The Old Testament law regarding capital punishments (Gen. 9:5) recognized that a life was worth a life and prohibited murderers from paying a ransom (Num. 35:31–32).

66. See Tatum, "A Theology of Economic Reform." Christians would tend to argue that human sinfulness and hence alienation from God is the basic problem.

67. The Bible and parts of secular philosophy also recognize these realities. Isaiah Berlin noted the existence of "tragic liberalism" that arises because there are inevitable conflicts between the various good objectives we might desire. See Isaiah Berlin, "The Pursuit of the Ideal," *The Proper Study of Mankind* (London: Pimlico, 1998), 1–17.

68. Wyatt, *Matters of Life and Death*.

69. See *United States Constitution*, Article 1, Section 2, Clause 3: "Representatives and direct Taxes shall be apportioned … according to their respective Numbers, which shall be determined by adding to the whole Number of free Persons, including those bound to Service for a Term of Years, and excluding Indians not taxed, three fifths of all other Persons…." Section 2 of the Fourteenth Amendment later superseded this clause and repealed the Compromise. See James K. Martin et al., *America and Its People* (New York: Harper Collins, 1993).

70. See Francis A. Schaeffer, *A Christian Manifesto*, in idem, *Francis A. Schaeffer: The Collected Works*, vol. 5 (Wheaton: Crossway, 1985).

71. See Schaeffer, *A Christian Manifesto*.

72. N. J. Wald et al., "Antenatal Maternal Screening for Down's Syndrome: Results of a Demonstration Project," *British Medical Journal* 305 (1992): 391–94. Strictly speaking, this was not a full CBA as there was no allowance for the value of the aborted babies' lives nor for any impacts on the mothers' longer-term health and well-being.

73. The scope of "geographical" may be troublesome. Should, for example, the UK government prioritize vaccination of its own citizens ahead of contributing to vaccine supply in the poorer countries? CBA techniques often imply a much higher valuation of a life saved in the Western countries compared to, say, Africa.

74. This principle could raise the question of what, if anything, he is prepared to use as a common denominator in order to compare costs and benefits. And if, as he recommends, we should be sensitive to the human, social, and spiritual aspects of caring, how do we compare the nonquantifiable with the quantified?

75. For example, in the context of COVID-19, access to a ventilator would not be decided on the basis of whether the patient had chosen to be vaccinated.

76. For biblical support for the fundamental equality across racial/ethnic groupings, see Gal. 3:28; Acts 17:26.

77. See A. Beaudet et al., "Review of Utility Values for Economic Modelling in Type 2 Diabetes," *Value in Health* 7, no. 4 (2014): 462–70.

78. One recent view is that such comparisons are in principle possible but not empirically meaningful. See Christian List, "Are Interpersonal Comparisons of Utility Indeterminate?" *Erkenntnis* 58 (2003): 229–60.

79. Interestingly, the Old Testament emphasis on widows, orphans, aliens, and the poor suggests that extra weighting could appropriately be applied to certain otherwise vulnerable groups. Wyatt provocatively points to his "first law of health economics": the cheapest patient is a dead patient. Death may be a "cost-effective option," but it would be absurd to conclude that we should automatically prohibit all costly medical procedures relating to complex conditions.

80. So far, at least, in the United States there seems to have been stronger use of cash incentives to encourage vaccine take-up (e.g., some states giving $100.00 per person) and hence greater "internalization of the externality" in the United States as compared to policy in the United Kingdom and Europe.

81. For a high-level consideration of the costs and benefits relating to mask wearing, see Maria Polyakova et al., "Can Masks Help with Reopening the Economy?" *A Stanford Institute for Economic Policy Research Brief* (Stanford: Stanford Institute for Economic Policy Research, April 2020). While that study was not a full CBA, it did indicate the likelihood that benefits would outweigh costs.

82. See McMullen, "Editorial."

83. An optimistic view could be that policymakers and economists do learn something from experience: After 2020, we know more about how to reduce infections at a lower cost to the economy and society.