I am aware that the title of this editorial is perhaps a little enigmatic. My apologies.

One of the fears most often raised when the prospect of extreme or indefinite life extension is discussed is that the therapies in question will be available only to a subset of humanity—perhaps only a very small subset. Standard economic arguments can be employed to argue that this subset will grow in size over time, as market forces succeed in driving down the costs of delivering the therapies, but many people are not wholly satisfied by such logic, not least because the track record of eventually universal access to any therapy—even one that has been available in wealthy societies for decades—is distinctly poor. Those at the coalface of public policy in regard to biogerontology research and its purpose must perpetually contend with policymakers’ apprehension on this point.1–4

There is, therefore, a need for consideration of whether society’s management of therapies to combat aging will break with this depressing precedent and give people’s health the priority it surely merits. There are three broad possibilities. Maybe we will treat these therapies as we have past ones, denying them to anyone unable to afford them; maybe we will make them available to everyone who needs them, at taxpayers’ expense; or maybe the question of which of these policies different societies will adopt depends on forward planning in advance of such therapies’ development. If the last of these is so, it is of great importance to marshal the best arguments we can find today for instituting a prospective policy of universal access. Accordingly, I offer my favorite one here.

Let us suppose that human immunodeficiency virus (HIV) were to mutate so that it could be transmitted as easily as the common cold. (I of course know that, mercifully, this is virologically fanciful.) In the scenario I wish to explore, everything else about HIV remains unchanged—its typical period of latency before progressing to acquired immune deficiency syndrome (AIDS), its amenability to permanent suppression by existing drugs, and the nonavailability of any therapy either to eliminate it altogether from the body or to prevent initial infection.

It is easy to see that, within a few years at most, essentially everyone on the planet would have HIV. The spread of the virus could not possibly be controlled by quarantine, since so many people would have it but not have been diagnosed. There would be no hiding place.

Sounds pretty apocalyptic, doesn’t it? Efforts to develop a vaccine and a cure would surely become feverish, but on current evidence they would not be expected to bear fruit particularly quickly.

Well, hang on—is it quite that bad? After all, we do have these drugs . . .
Let us look at a few round numbers. In the United States, roughly one person in every 250 has HIV—that’s about 1 million people. The drug treatment to keep someone’s HIV under control costs about $30,000 per year, so that adds up to about $30 billion per year. Thus, if everyone in the United States had HIV, we would be talking about $7.5 trillion per year. But the actual cost of production of these drugs is far, far lower: generic forms of them are being synthesized in India and sold (still at a profit, mind) for only $300 per year, and even lower prices are in the offing. So, even if we allow for a modest retention of profits for drug manufacturers—let’s say, a price tag of $1200 per year per person—then actually we’re looking at only $300 billion per year, or about $1 billion per day, to keep everyone in the United States healthy even if they all have HIV.

Now, a couple of points. First, you might think that “only $300 billion per year” is a pretty curious use of the word “only.” Well, think again, because that’s almost exactly what the United States is currently spending on the war in Iraq. (I am not commenting here on the relative merits of these expenditures, you understand—I’m just pointing out that we have a precedent of an unexpected expense of the same size that is not bankrupting the nation.) Second, you might be against the infringing of patents, so you might object to my slashing the cost by a factor of 25. But is your belief in the patent system stronger than your belief in stopping your neighbours—or yourself, or your family—from coming down with AIDS and dying horribly? Ask yourself honestly: if this scenario actually happened, and one major party campaigned on a manifesto to raise taxes by $1,200 per year for the average person and to spend that money on generic drugs to prevent the HIV-infected electorate from developing AIDS, and the other party campaigned on a commitment either to raise taxes by $30,000 per year for the average person or not to provide the drugs from the public purse at all, who do you seriously think would get elected?

I hope I have convinced you what would happen in the above scenario: we would find the resources to treat everyone. We would probably find the resources to treat everyone in the developing world too, just as we are now stirring ourselves to treat everyone who needs such drugs in the developing world today: the meteoric rise in the Chinese, Indian and South-east Asian economies means that the number of people living in nations that could not support this expense is falling fast.

Now, let us look in the same way at society’s view of aging when therapies to postpone it greatly are developed—or, in fact, when proof-of-concept experiments in mice have been successful enough that human therapies are widely anticipated to arrive within a decade or two. (This result—success in mice dramatic enough to sway expert, and thence public, opinion to the view that robust suppression of human aging is only a matter of time—is what I have traditionally termed robust mouse rejuvenation or RMR.)

First let me remind you of my view of what form these therapies will take. They will not “compress morbidity”—postpone frailty without similarly postponing death—because postponing frailty will always similarly postpone death. They will be divide-and-conquer therapies that selectively target particular aspects of age-related damage, thereby rendering the concept of “biological age” meaningless except in terms of mortality rate. They will not, at first, be able to postpone frailty indefinitely—but they will be able to postpone it sufficiently to buy time to refine the therapies, thereby postponing it again for the same people, buying more time, and so on: the “longevity escape velocity” phenomenon about which I have often written in this space. And we can describe the necessary therapies in sufficient detail at this point that it is not unreasonable to predict their implementation in mice (the RMR milestone mentioned above) within a decade if adequate funding is available.

I suspect you can quickly see the similarities. Everyone has aging. The therapies in question will not be one-off cures, because aging is not like that: they will be aging-suppression therapies, which we will have to take for as long as we live (although probably much less frequently than those with HIV need to take their drugs today). Within that limitation, however, the therapies will work: people’s aging will not progress. But the therapy will almost certainly be very expensive, at least at first. In the first instance that expense will be mainly for fund-
ing research, training greatly increased numbers of medical personnel, building additional drug synthesis facilities and such like. $1 billion per day, the same figure I discussed above, is as good an estimate as any.

So let us ask the opposite question: what are the differences between a post-RMR world and a universal-HIV world? I would say that there are really only two:

• The therapies will not yet exist at the time RMR is achieved;
• Our acceptance that human aging can probably be defeated fairly soon will be new, while the universality of aging is the status quo ante: this is the reverse of the situation with HIV in the above scenario.

I would argue that neither of these differences has any real chance of causing society to behave any differently in the aftermath of RMR than in the universal-HIV scenario. The nonexistence of the therapies is really no different than the nonexistence of enough antiretroviral drugs, which would certainly be the initial situation in the scenario I have described: we will work to develop those therapies as fast as possible, just as we would work to scale up production of antiretrovirals as fast as possible, and we certainly will not let our contemporary attitude to safety slow us down. The idea that the order of events could matter seems equally far-fetched; if everyone has a life-threatening health condition and we have a shot at making it no longer life-threatening, we will clearly strive to do so. QED.

REFERENCES


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