

Solutions Within Reach

Comment on Address at Harvard by Bill Gates

Of the many developments from the first part of the twenty-first century, there are two most likely to be in a history book 250 years from now. The first is the growing integration between what had been called the industrialized world and what had been called the developing world, with all that that would mean for the nature of the global system. And the second is the revolutions that are underway in the life sciences and what they contributed to our understanding of life itself and to the development of operational approaches to combating disease.

At the intersection of these two great developments of our age is the set of challenges around global health. More people will live or die based on our success in addressing AIDS, malaria, and other diseases than will live or die based on our success in creating prosperity, based on our success in advancing freedom, or based on our success in keeping the world at peace.

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Fortunately, there is also no public challenge more amenable to effort, through increased resources and human commitment. There are literally millions of lives a year that could be saved with today's knowledge, today's resources, if we simply were able to make the requisite commitments. And there are yet millions of people whose lives could be saved each year with advances in knowledge that are within our reach, that do not involve miracle cures but involve the steady and sustained application of research protocols that we know. That is not true with respect to many of the world's other great problems. Someone may have an inspiration for how to promote peace. Someone may have an inspiration as to how to promote economic growth everywhere that hasn't been found yet. In public health, we have the knowledge of today and we have the pathways to the knowledge of tomorrow. And when there is a situation in which the greatest problem and challenge facing humanity is also one of the more tractable challenges facing humanity, it behooves us to be seriously engaged.

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We in the City of Boston have the highest fraction of concentrated talent in the life sciences that exists anywhere on the planet earth. You look at the five institutions in the world that are able to attract the most peer reviewed scientific funding. Institution number one, institution number two, institution number three, institution number four, and institution number five are all here in Boston.

If we at Harvard are in possession of the most significant life science concentration of talent that there has ever been—which I believe is the case—then we have an obligation to this problem. During my Presidency at Harvard I placed a great deal of emphasis on the innovations at the Medical School and the Public Health School in establishing a residency program in global health and making global health a focus of education at the undergraduate level where we introduced a half-dozen seminars and classes on global

health issues. We also sought to draw a larger fraction of the University's scientific talent into global health. One of the things that was most exciting was the collaborations between Diane Wirth and others at the Public Health School with the Broad Institute—the former at the cutting edge of applied medicine to address these diseases, and the latter at the cutting edge of genomic research with respect to these diseases. That's where, and in what way, progress is likely to come, though one certainly can't predict just what form that progress will take.

IT IS POSSIBLE TO COUNT, AND TO CARE

I said in my inaugural speech that Universities should be places that should be about ideals as well as ideas. One of the things that I think is a very important product of a university education, hopefully, is students' sense of obligation to try to leave the world a better place than they found it. Through work on global health, there's the potential for them to do that. That's why as one very important component of the University's efforts to promote internationalization, we very substantially and especially encourage students to go to the developing world and to work in health care clinics and health projects of various kinds in developing countries.

In a broader and deeper sense—something I also stressed in my inaugural

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address and throughout my presidency—was the commitment to data-based rather than purely intuition-based judgments on difficult problems. An example to which I often referred is the book, *Moneyball*, by Michael Lewis. *Moneyball* is about the rather implausible subject for a social science book, baseball. What *Moneyball* demonstrates is that the Oakland A's won more games than any team in the American League over a five-year period, while having a payroll that was one-third of the payroll of other teams. And the question is: How did they do it? It does not appear that they did it by being lucky. It does not appear that they did it because their athletes strived harder or were a better team than the other athletes.

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It happened primarily because their athletes were better and more wisely chosen than the athletes on the other teams and played with shrewder and better strategies than the athletes on the other teams did. And how did they come to be better chosen? Through econometrics.

A very wise baseball general manager hired a PhD in econometrics to study the question of what were the predictions of who would be a good

baseball player. And it turned out to be the case that almost everything that the baseball industry knew was wrong. The baseball industry was not in doubt that it was very important to be and to look like a terrific athlete. The baseball industry was not in doubt that the ability to swing powerfully and hit the ball a long way was a crucial predictor of success. The baseball industry was not in doubt that one's time in the 40-yard dash was highly predictive for how effective a baseball player would be. And the baseball industry was not in doubt that really the best athletes were the guys who would go straight from high school to the minor leagues and to the major leagues, rather than playing college ball.

There's one very important aspect of those four propositions: they all turned out to be wrong. The appearance of athleticism, beloved of baseball scouts, turned out to be almost entirely non-predictive. How many walks a player got on his college baseball team turned out to be much more predictive of his success than how many home runs he hit. Fielding averages turned out to have very little to do with actual effectiveness in fielding. And very systematically, teams that drafted players out of college did better than teams that drafted players out of high school. Confronted with this evidence, the reaction of the baseball industry, generally for several years, was to simply say that was a lot of nonsense that had come out of a computer, and you had to talk to people who had really played baseball and "knew the game" The Oakland A's have won long enough that we now have a general manager here in Boston who plays baseball that way. But what's true of baseball is actually true of a much wider range of human activity than has been the case before.

In the last 30 years, the field of investment banking has been transformed from a field that was dominated by people who were good at meeting clients at the 19th hole, to people who were good at solving very difficult mathematical problems that were involved in pricing derivative securities. The field of environmental regulation has substantially given way in its actual application from people who were committed activists and attorneys to people who were skilled in performing cost-benefit analyses. The presidential campaigns that at one time put out the call for a group of bright lawyers to staff them, now put out the call for bright economists and bright MBAs to staff them. And I could go on and on with these examples, suggesting that the kind of analytical techniques that come out of social science are finding more and more widespread application.

Those same techniques of analysis are possible with respect to what types of interventions work to promote public health. What is the best way to interfere with sexually transmitted disease? Which

regimens do and do not work with respect to AIDS? What are the optimal strategies in an environment where blasting a disease is important but where avoiding the creation of resistant strains is important? What are the optimal strategies for using drugs? These are questions we don't have to guess about any more. We have critiques of rigorous analysis for figuring out the answer and that is not just socially important. It is an enormous practical, intellectual challenge and it one that is within our reach, and it is one that is at the center of a great many people's research here at the Public Health School and in other parts of the world.

In the same way, one of the hallmarks of Bill Gates' work has been the recognition that you can count and care. The more morally important the problem, the more important it is to bring real rigor and discipline to its solution. It is a tragedy—it is, in a sense, killing people—when resources are poorly allocated because people weren't really ready to study what their effects were.

So an additional strength that I hope the University communities can bring to the challenge of global health, which Bill Gates certainly has brought to this area, is a commitment to rigorous accountability, careful statistical evaluation, and optimal targeting of interventions in a world where you're never going to be able to do everything.

A COMPLEX CHALLENGE

While we have in our hands many of the tools that we require to address the challenge of global health, we have not yet arrived at a workable set of approaches for deploying those tools. In that sense, Bill Gates is absolutely right in pointing to complexity as a key characteristic of the global health challenge.

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Hard problems are hard, that's why they haven't been solved yet. If it's not a hard problem, universities shouldn't have to be doing fundamental research on it as late as 2007. Global health takes on additional complexity because of the number of disciplines it touches—anthropology, economics, political science, every kind of chemistry, and biology, increasingly, in a number of respects, physics, and statistics of epidemiology. So universities at their best are going to be the sort of generalist institutions where you can draw intellectual excellence in all those areas and bring it together. But very often, that is not their tradition.

Universities are curious institutions. On the one hand, they have a responsibility for what is most cutting edge—in the education of youth and the creation of new ideas—on the other hand they're probably more ossified in their structures and their rules than almost any other institution in our society. As president of Harvard I sought to create new University-wide funds to address these problems and to bring into existence new structures that would bring people together more than they are traditionally. In doing that there was tremendous resistance. There was often a sense in the Public Health School that they should have a monopoly over consideration of these issues and that there were no structural changes necessary. That was not my view. I think we had some success in mobilizing funds and bringing people together in new structures—the so-called HGHP, the Harvard Global Health Program—that was very valuable motion, but we're certainly not at our destination.

DIRECT ACTION

Given the foregoing, should universities begin looking beyond teaching and doing research and focus more on actually doing and making a difference through direct action.

Not necessarily. As intuitively appealing as might be the general notion of moving beyond the “ivory tower,” universities need to proceed with considerable caution in moving beyond their areas of greatest strength in teaching and in research. The history of organizations and institutions of every kind teaches that if the mission is too diffuse, the mission is not advanced in any particular direction.

Yet, as I've been here longer and as I've spoken with more people in the medical community, I've come also to understand that there are types of knowledge that are not achievable except through direct involvement with patients and direct involvement with settings. An experiment in a new way of delivering care is, yes, the delivery of care, but it is also a piece of research from which the world learns if it succeeds or if it fails. And that's why it seems to me that as a university, we need to be very disciplined, very careful, but also very creative in thinking about how we can give our students and our faculty the opportunity to engage with these issues, to engage in environments that are much less regulated and regular than the environment the Harvard hospitals or Harvard Yard represent, but environments in which they can really make an enormous difference and in which their example can have enormous effect.

CONCLUSION

To understand the scope of the possibilities to which Bill Gates referred in his address at Harvard, just think about these facts:

- Globally, five million people die each year of malaria, AIDS, and tuberculosis. Five times as many Americans have died from infectious diseases as have died in military conflicts in the last 50 years.
- If all cancer were eliminated in the United States, it would produce an increase in life expectancy of two to three years. Since 1975, life expectancy in the developing world has increased by between eight and nine years; that is the equivalent, in parts of the world where 90 percent of the world's population lives, of curing cancer four times over.

Public health is not a field where we're hoping for a breakthrough; this is a field where we know how to allocate thought, allocate resources. There's a consequence: save lives and make humanity better off.

If we as people are going to do our part in responding to that challenge, we have to be prepared to act and to recognize that the challenge cannot be met by the market alone. Countries where average incomes are less than \$2 a day are not going to fund basic medical research programs. Drug companies are not going to do the most basic kind of research anyway, since the benefits flow so widely. And they are certainly not going to do applied research where the only market is in countries where the income is only \$2 a day.

This is not a problem that's going to get solved in any one place. Government has its major role. When I was in the government, I was very focused on appropriating funds for the Global Vaccine Initiative on new tax credits to encourage the development of drugs, an idea that came out of research here at Harvard. God knows the countries affected have a role that they need to play. With \$2 income per capita per day, it becomes even more important not to waste that money on corruption, or to allow its diversion.

This is going to be a hugely important set of issues in the future even more so than it is in the present. The kind of funds and highly informed commitment that the Gates Foundation has made is something of profound importance. There's a very large role that Universities can play. Harvard, when I was president, launched major initiatives, and we tried to do our part. But there is much more to be done.