

Commencement Address by Seth Berkley: Johns Hopkins Bloomberg School of Public Health. May 23, 2017

The best of times, the worst of times: the modern dichotomy of public health.



Dean Michael Klag (left) and Gavi CEO Dr Seth Berkley shake hands during his commencement address at the 2017 Graduation ceremony. Credit: Larry Canner/2017.

Dean Michael Klag here presiding over your last graduation ceremony as Dean, Dean emeritus Al Sommer, distinguished Faculty, proud parents, awesome class of 2017, and dear friends... congratulations to all of you! It is a great honor for me to share this special day with you. Students, I know you have worked hard to complete your studies and I expect you will go on to a rewarding career in Public Health joining other Hopkins alumni who have been practicing game changing public health for now more than a century!

Public Health is an honorable profession that is often under sung but almost always over-delivering. Since public health's most important goal is the absence of risk or of disease, when it is not working everybody screams but when it is working, it speaks with a whisper and often goes unheard.

We live in challenging times. On the one hand, science and technology are propelling our societies to places we once could only dream of, yet at the same time there are global trends at work that are threatening to undermine that very same progress. We are, for example, on the cusp of what Klaus Schwab, Founder of the World Economic Forum has coined, the Fourth Industrial Revolution, a revolution of innovation that will play out at a breathtaking pace during your professional careers, fusing the physical, digital and biologic worlds. Yet at the same time the rising tide of nationalism and the increasing focus away from global issues towards more inwardly looking domestic agendas is feeding the post-truth agenda that rejects science. And all of this is playing out in the face of formidable global trends such as population growth, aging, human migration, climate and habitat change, environmental pollution and urbanization which promise to make our work even harder.

To put it another way, it is the best of times, it is the worst of times. I am sure you recognize this as Charles Dickens', famous opening to his 1859 *Tale of Two Cities*, right? In fact, the last time I heard this, it was in an English translation from the Chinese speech of President Xi of China, speaking at the World Economic Forum in Davos earlier this year, the day before the US presidential inauguration—in what was quite a reversal of roles. Not just because this particular type of speech at Davos is usually reserved for Western leaders, but also because President Xi, the leader of the world's largest communist party was quoting Dickens and used this opportunity to defend globalization and talk about how it is here to stay.

Why do I agree with President Xi that it the best of times? Through the interventions that your predecessors made, Child mortality has dropped by more than half over the past 25 years despite an almost 40% increase in the population. And life-expectancy is at record high. And we know, health makes wealth! Global poverty is at its lowest level ever. Extreme poverty has declined from close to 40% in 1981 to around 11% in 2013, despite substantial population growth. This dramatic progress in health is not mostly from the curative health care provided by the close to \$10,000 spent here per capita in the US, but rather from investments made in public health and based upon public health science.

Investments in science and technology are continuing to pay off. We can track disease in new ways, analyse the data in real time and respond more quickly than ever before. We have powerful new tools in our armamentarium which

can help us deliver public health: From mobile phones, the internet, satellite monitoring, and artificial intelligence, to genetic sequencing, synthetic biology, and CRISPR/Cas9; how we use these to further accelerate our public health goals will determine how successful you will be.



Gavi CEO Dr Seth Berkley delivering his commencement speech to the John Hopkins Bloomberg School of Public Health 2017 Graduation class. Credit: Larry Canner/2017.

As an example of technology leapfrogging, let me move to Kenya—a relatively poor country with a high growth rate and a per capita income of around \$1400. We have a hard time estimating the accurate vaccine coverage there and in following up children missing vaccine doses. 10 years ago, entrepreneurs began to work on a mobile money solution which they called M-Pesa (Pesa is money in Swahili). The conventional wisdom was that poor people didn't have money and wouldn't be able to do banking. Today, the system is ubiquitous and almost half the value of the GDP of Kenya is handled through the M-Pesa system demonstrating how fast technology can spread and leapfrog over other more traditional industries. In fact, today there are far more households worldwide with access to a cell phone than have access to a working toilet. Using technology, these types of seismic changes should be possible in public health as well. Does anyone here believe that within the

next 50 years we will not be able to track each and every child in order to do e-follow-ups on them to ensure they don't miss out on vaccinations and other vital health interventions? The reality is that this is possible today, as demonstrated by many pilots including some done here at the JHSPH, but the challenge is how do we take it to scale, particularly in resource poor settings?

Another example: Today, Rwanda is delivering emergency supplies of blood to rural districts by drone aircraft. So now whenever a mother is hemorrhaging during childbirth, instead of waiting hours for a motorcycle delivery, they can have the blood within 20 minutes. And this is no small-scale trial, it is a nationwide service set up between the Rwandan government, a small Californian startup called Zipline, UPS and my organization Gavi. In the next few months, they will start delivery of rabies vaccines after dog bites. The possibilities are endless.

That's the good news, so then why is it also the worst of times? For one, truth and science are under attack; and these are absolutely critical to our profession. This is happening actively when groups flood the internet with known false information for personal and economic gain or by confusing beliefs with truth. To borrow a line from my good friend, New Yorker science journalist Michael Specter, "everyone is entitled to their own opinion... but they are not entitled to their own facts". But this is also about trust. Our populations are losing trust in institutions that are there to serve them. Trust is critical to public health. In my work, Gavi, the Vaccine Alliance, provides vaccines for 60% of the world's infants—those living in the poorest countries. Giving vaccines to healthy babies requires parental trust. A vaccination often makes an infant cry and sometimes causes minor side effects, such as limb soreness or mild fever, which can be upsetting for the child and parents alike. That is why it is so important that parents trust the motivations and competence of the provider, the manufacturer and of course the government sponsor—particularly if the vaccines are mandated by law, as they often are, to provide herd immunity.

Today, the ease with which anti-vaccine rhetoric can spread represents a threat to that trust. Vaccine hesitancy is now primarily seen in wealthy countries where disease burdens are virtually invisible and therefore, often the wealthiest and best educated question the need to vaccinate their children. Outbreaks of previously controlled diseases such as measles are being seen in

France, Italy, Switzerland, Canada and the United States. A few weeks ago we learned about the worst measles outbreak in two decades in Minnesota where most of the cases are occurring in unvaccinated children in the Somalian community targeted by anti-vaccine groups and therefore have a measles vaccine coverage of 42%—less than half of that of other Minnesota born children. And I hear the Somali diaspora in the UK, Sweden and Denmark are also affected now.

Tragically, there are others who would like to ride on this movement. And take these battles to developing countries where the institutional structure to rebut their claims will be weaker.

Today, information, good or bad, moves around the world even faster than disease; in fact, given the internet, at literally, the speed of light. In a sense, we are witnessing a pandemic of misinformation and the 'Reproduction Rate' is incredibly high. As Mark Twain has said well before any of today's fake-news accelerators: "A lie can travel halfway round the world while the truth is still putting on its shoes". I must say, I was proud to see hundreds of thousands of scientists marching across the world to protest the changes that are happening, but that fight needs to continue.

I cut my teeth on these issues as a budding young infectious disease epidemiologist in Uganda when President Museveni took over in 1986 after 15 years of severe instability. Working for Jimmy Carter on immunisation and child survival, I realized that little was known about HIV in Africa. We set up the first surveillance system for AIDS and then did a national sero-survey. Despite the patchy access due to security issues the results were dramatic. In fact, I questioned the data and lab people to see if they made an error. I carefully prepared a memo with appropriate confidence intervals given the uncertainty from the sampling challenges. As you imagine, I was horrified when the President published the results in the national newspaper with the headline, 790,522 Ugandans are HIV infected. But this transparency with the best data available was a powerful force to advocate and get people behind the effort—as opposed to Presidents Mobutu and Moi in adjacent Zaire and Kenya both of whom denied spread of HIV in their countries.

Let me return to immunisation. The work of Gavi and others has helped us reach an all-time global high with immunisation coverage, with 86% of children now receiving a DPT3 containing vaccine—the usual immunisation tracer. But despite increasing availability by countries, 19 million children are still missing

out from full coverage even with the basic vaccines and many countries do not have coverage with the newer vaccines, meaning that there are still an estimated 1.5 million deaths annually from vaccine preventable diseases. This is our shared challenge. There is a reason why children are under-immunized or completely missed. In earlier periods, we assumed this was due to poor infrastructure or geographic isolation—and of course, these problems still exist. But often, groups not getting vaccinated are from stigmatized minorities, poorer children, different tribal groups or different castes. Add to this, the incredible urbanization that is underway and our newest challenge is learning how to reach those missing children living in growing slums right under our noses.

To tackle these delivery challenges, we need to use the new tools at our disposal. One of our problems is having accurate denominators. The most common vital registration certificate is not a birth, death or marriage certificate, but a child health card—with more than 90% of kids in the world having one in some form or other. SDG16 calls for universal registration by 2030; something that could be easily accomplished by using technology to link a child health card to birth registration; but doing this at scale is a mountain waiting to be climbed.

And what about the nationalist agenda? Despite what some politicians would like us to believe, there are no longer any borders. I often have dinner in Nairobi, breakfast in London and lunch in New York—all within the incubation period of dozens of infectious diseases. And I am not alone, more than 1 billion people travel outside of their country each year. Furthermore, walls or immigration restrictions cannot stop mosquitos. And given demographic pressures, climate change and urbanization, there is evolution certainty that we will continue to see epidemics of infectious disease. I chose infectious disease to make these points as it is the area I work in, but we could just as easily be talking about effects of the environment, climate change or even worker safety.

So what does all of this mean for you? I would suggest no matter where your career takes you, you will need to be a globalist. This means caring about the rest of the world, keeping up with best practice and research wherever it is done and understanding the interconnectedness that underlies our world. Then, whether your work takes you to the bush in the Democratic Republic of

Congo where the most recent Ebola outbreak is now underway, or you end up doing research right here in urban Baltimore, always keep in mind that it is incumbent upon you to understand the local context and be sure the system is operating using the best information available and has as its goal to do the right thing. If not, it is our role as public health professionals to help to change it. And if it is, then it is our role to help restore trust in “the system” and bring truth and data back to its critical role. You are public health professionals but you must also be advocates or even, dare I say, activists.

What does it mean to be an activist; a person who campaigns to bring about political or social change? It means paying attention to what is going on—to the prevailing ideas. It means not being content to just do the research or even publish the result, but rather to assure that it is translated into communication and actions that can be understood and acted on by decision makers and, if appropriate, the public. It means standing up for the truth when decisions are being driven by fake results or fake news. Or when lobbyists have the upper hand despite the clarity of the data.

There is a long history of activism in public health. Public health practitioners have long fought against strong forces to bring us clean water and air, good housing, nutrition, environmental standards, and vaccine herd immunity. In fact, this distinguished school proudly established more than 100 years ago by funding from the Rockefeller Foundation, where I used to work, is now named for an unlikely public health champion—Michael Bloomberg. Why did he become a great champion? Despite a background in technology and finance he is obsessed with data. One of my favorite Bloomberg quotes is “In God we trust, everyone else bring data”. For example, when he realized what effect Tobacco was having on the residents of my home village NYC, he became a zealot. Working with my friend Tom Frieden, despite enormous and powerful opposition, they were able to tackle the resistant epidemic of tobacco-related disease in New York and led the way for changes on smoking regulations around the world.

As vaccine advocate in chief, I spend much of my time meeting with political leaders trying to convince them to increase their spend on prevention, PHC and vaccines as well as to encourage them to document where there are inequities and focus on the areas with lowest coverage. This is not rocket science! Countries may not be able to build modern tertiary care hospitals in every district...but they can immunize all of their children. Vaccines don't

deliver themselves and so successful routine immunisation means a health care worker, a supply chain, energy for a cold chain and a data system. And of course, most important, community trust. This is the pathway towards progressive universalism as a way to move toward UHC. Countries start reaching the unreached and when they have more resources they can build on this system with other interventions.

But back to today. After your academic studies some of you will go back to work and some will just be starting your careers to improve public health. As you do so, never lose sight of the vital role you play as a advocate for public health. Use your education and the friendships and relationships you have formed to make the world and not just your community a better place. Let science and truth be your guides and fight for them. Strive to make new technology useful for the poor and underserved. And most importantly, let the whispers of public health speak as loudly as they should for I know we can continue to change the world—protecting health; saving lives—millions at a time.

Congratulations class of 2017 and thank you for your attention.