



2013 Association of American Physicians Presidential Address

Solutions to global health challenges: no more Band-Aids

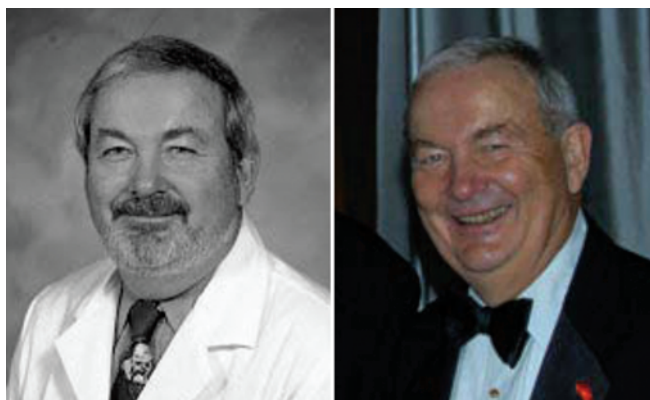
Warner C. Greene

Thank you very much. It's a pleasure to be here. I would like to describe to you an alternate career. It might seem strange. Why would a professed molecular biologist, who has spent an entire career studying the basic mechanisms of HIV pathogenesis, be talking to you today about global health? Well, let me tell you a story. This story begins with Merle Sande (Figure 1), who was Chief of Medicine at San Francisco General Hospital, a close and dear friend. He was one of the main reasons I moved to the University of California, San Francisco, and to Gladstone.

In 2004, Merle invited me to join the Board of Directors of the Accordia Global Health Foundation, which works in Africa to prevent the further spread of HIV, and I took him up on that offer. My wife and I flew to Entebbe, Uganda, which is on the shores of Lake Victoria in East Africa. And I'll tell you what I saw during that visit. Having gotten off the plane and heading toward ground transportation, I saw the strangest and ugliest bird I have ever seen in my life: a Marabou stork, very common in Uganda and also known as the "undertaker bird." Also on the road from Entebbe to Kampala, I was struck by evidence of one of the burgeoning local industries: the making of coffins, big and small (Figure 2), for the victims of HIV. I was also struck by the poverty that was apparent on the way. Even a relatively nice house, with a tin roof and solid walls, strikingly represents the poverty there (Figure 3). Then, I entered the clinic at the Infectious Diseases Institute (IDI). This was on a Monday. I walked into the clinic; it was dead quiet, silent. You could hear a pin drop; heads were down, no one smiling.

I had the opportunity to return to the clinic the next day, fully expecting to encounter the same situation. But instead, people were lively, chattering, talking, and laughing. I asked the nurse, "What's the

Figure 1
Merle A. Sande, MD, 1939–2007.



difference between Tuesday and Monday?" The nurse said, "Oh, on Tuesday, all of these patients are in a clinical trial and are receiving antiretroviral therapy. On Monday, there's no therapy." The power of the availability of antiretroviral therapy to change people's lives really impressed me. So I wrote an article titled "Turning Mondays into Tuesdays" (1).

Where do we stand in the global HIV epidemic? Currently, 34 million people are infected, and 26 million are dead. This ranks as the fourth worst epidemic in human history. Seventy percent of all new infections are occurring in sub-Saharan Africa. When one looks at some of the drivers of this, life and death in the poorest and richest countries, one sees that in the 50 least-developed countries, the annual per capita income is about \$383, contrasted with \$35,000 a year in the developed world. Life expectancy is fully 26 years different if you're born in a less-developed country. And the under-five mortality rate is 153 deaths per 1,000 live births in the developing world, with far fewer, six, in the industrialized countries. Also, the projected growth of the population worldwide (currently 7.11 billion people) will preferentially affect the less-developed countries, those least able to accommodate this growth.

So, back to Merle. In 2007, he developed what would be fatal leukemia, and on his deathbed he asked me to succeed him as

President of the Accordia Global Health Foundation. It was a privilege to do so, and I must thank the Gladstone Trustees and Robert Mahley for allowing me to spend a fraction of my time involved with Accordia. One of my first visits was to the Bill and Melinda Gates Foundation to see Tadataka (Tachi) Yamada, who was heading up Global Health for the Gates Foundation. I wanted to seek his advice, and I received very good counsel from him. Within minutes of sitting down in his office, he whipped out a piece of paper and drew a triangle (Figure 4). He said, "Warner, here at the bottom of the triangle we see the



Figure 2
A burgeoning local industry in Uganda: the making of coffins, big and small, for the victims of HIV.

Conflict of interest: W.C. Greene is Executive Chairman of the Accordia Global Health Foundation.

Citation for this article: *J Clin Invest.* 2013; 123(11):4967–4970. doi:10.1172/JCI73710.



Figure 3
Signs of poverty in Uganda.

number of doctors, nurses, midwives, and health care workers that are needed; the deficit in Africa.” And he made the point that we must address that urgent need. But if you’re going to really make a difference in the capacity of Africa to deliver its own health care and to break free of this dilemma, you need to work at the top of the pyramid. You need to be building and strengthening centers of excellence, creating better and stronger medical schools, nursing schools, hospitals, and clinics.

This was music to my ears, in fact, since the mission statement of the Accordia Global Health Foundation was to overcome the burden of infectious diseases in Africa by building sustainable centers of excellence, strengthening medical institutions, and developing health. At Accordia, we have taken a very networked approach, working with individuals and foundations and establishing multiple academic partnerships. One of our strengths is our academic alliance, which spans well over 20 universities, involving infectious disease experts from around the world. We also have a top-flight scientific advisory board. Just last week, I was in Kampala for the Scientific Advisory Board meeting and other meetings of Accordia. We also collaborate with governments, bilaterals, and multilaterals for our President’s Malaria Initiative (PMI) Global Fund. And we’ve also established a number of corporate relationships, including with Pfizer, Exxon Mobil, Gilead, and BD.

Before I leave you with the impression that Africa is a lost cause and that we’re tilting at windmills, in fact, Africa has been referred to in a report by McKinsey & Company as “lions on the move” (2). It may surprise you to know that, since 2000, the average GDP growth rate throughout Africa has approached 5%. Even in those countries without oil, the GDP is increasing at about a 4% rate. In fact, Africa’s collective GDP in 2008 was roughly equal to that of Brazil or Russia — among the emerging BRIC economies. Africa’s combined consumer spending in 2008 was \$860 billion. The continent has had 316 million new mobile phone subscribers since 2000, 60% of the world’s total

uncultivated arable land is in Africa, and 20 African companies have revenues in excess of \$3 billion. But one thing that is holding Africa back is its deficiencies in health care, particularly with regard to infectious diseases, but also noncommunicable diseases.

Today, I want to review with you some of the impact of the gang of three that are undermining progress in health in Africa: malaria, TB, and HIV/AIDS. The global burden of malaria is about 1.3 million annual deaths and 350–500 million clinical episodes per year; and every 30 seconds in Africa, a child dies of malaria — a preventable situation. Now we have new medicines, we have insecticide-treated nets that are being deployed to great effect, and we have a vaccine (about 50% effective but unfortunately doesn’t appear durable). In terms of our malaria efforts, we are now expanding our focus beyond Kampala and the IDI to Malawi.

Malawi is located in the southern part of the continent, also on a large lake, Lake Malawi. The idea here is a radical one. It’s a first-of-its-kind approach to create an International Center for Child Wellness. This center would be multisectoral, combining a focus not only on health, specifically pediatrics, but also on food security through efforts in agriculture, education, and use of the latest technologies. The wellness center would go far beyond the eradication of disease to actually embrace the full wellness of children in Southern Africa. Recently, I met with President Joyce Banda of Malawi (Figure 5), who has given us absolute, unconditional support for this effort. She is very interested in pediatric and maternal health, and I look forward to working with her.

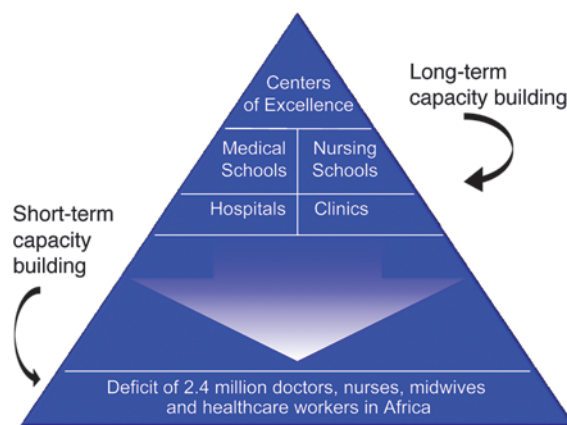


Figure 4
At the bottom of the health care pyramid in Africa, a severe need for doctors, nurses, midwives, and other health care workers.



Figure 5
The author with Malawi President Joyce Banda.

In terms of TB, it might surprise you to know that one-third of the world's population is infected with this bacterium, with 8.7 million new TB cases and 1.4 million deaths due to TB in 2011. Indeed, TB is the leading killer in individuals who are infected with HIV, causing one-quarter of all deaths. Naturally, of concern is the spread of multidrug-resistant TB, which is present now in virtually all countries surveyed.

This brings me back to yet another personal story. On that first visit to Uganda — which forever changed my life, and when the effects of HIV/AIDS hit me squarely between the eyes — I saw a young man about 25 years old. He had bilateral lower-extremity Kaposi's sarcoma. The treatment plan for this man, the next day, was to have both of his legs cut off. That is the reality. We know that many of these cases of Kaposi's sarcoma will resolve entirely with appropriate antiretroviral therapy, and for those that don't, there is appropriate chemotherapy.

That really brings me back to the IDI, which was created by three individuals: Merle Sande; Nelson Sewankambo, then the Dean of Makerere University School of Medicine, now the Principal of the College of Health Sciences (Figure 6); and Hank McKinnell, who was at that time the Chief Executive Officer and Chairman of Pfizer and continues as Chairman of the Board of Directors of the Accordia Global Health Foundation. The three of them founded, funded, and created the IDI at Makerere University (Figure 6). Now, I would stress that while Accordia and Pfizer built this institute, we gifted it to Makerere Univer-

sity in 2004, with Dr. Keith McAdam as its first director. It is a wholly African-owned, African-led institution of which I am very, very proud. At the time of the building's inauguration, I had the opportunity to engage Ugandan President Yoweri Museveni in conversation about new approaches to HIV treatment. He has been a leader in the ABC strategy (Abstinence, Be faithful, use a Condom); he was one of the first African leaders to speak out about HIV/AIDS. So what has the IDI accomplished? Why am I so enthusiastic about this institution, this center of excellence? Currently, it has 10,000 active patients enrolled in a clinic within its own walls. But in addition, it has created a network of clinics throughout Kampala City, whereby 60,000 clients with HIV who had not been previously treated are now in care.

The IDI clinic is becoming a principal referral area for individuals failing treatment and a specialty clinic, as it should be. In addition, the IDI is reaching out to over 780,000 people in rural Uganda, covering 50% of the districts. I was in rural Uganda five days ago. I walked into a level-three health facility, and they had thrown up a tent, put down plastic on the floor, and were performing circumcisions every 15 minutes. Within this tent were four surgical suites with completely aseptic conditions. This was accomplished at a cost of \$50 a day, which is one of the cheapest in Africa, and with a complication rate of less than 1%, one-third the typical frequency for this procedure. This is in a location where I get no cell phone signal. Overall, they performed over 22,000 circumcisions within the country.

The IDI has built 60 laboratories throughout Uganda and has trained, throughout all of sub-Saharan Africa, more than 10,000 individuals from 28 countries. They've published 220 papers in peer-reviewed journals and had 18 young trainees come through the program, obtain their PhD, and begin the transition to faculty status. I am really happy with the progress of the IDI. The one thing they are missing is laboratory-based science. And I believe that I will now be able to take my Gladstone experience and my African experience and meld the two by creating a translational and basic science laboratory at the IDI. We believe that there is so much pent-up demand for bench science among these young PhD students, young Ugandans. I really look forward to carrying that initiative forward.



Figure 6
Nelson Sewankambo and Hank McKinnell at the ribbon-cutting ceremony for the inauguration of the Infectious Diseases Institute.



Figure 7

Alex Coutinho, Sande-McKinnell Executive Director of the Infectious Diseases Institute at Makerere University, Kampala, Uganda.

Let me conclude by making the point that one of the greatest successes in the history of modern medicine has been the development of effective combination anti-HIV therapy that restores the quality and length of life. We now have over 30 approved antiretroviral drugs. This is truly amazing compared to the time of my arrival at San Francisco General Hospital, when everybody was infected and everybody was dying, and there wasn't a thing we could do. Now it has become an outpatient disease. At the 2012 ASCI/AAP Joint Meeting, Myron Cohen spoke about a trial called HPTN 052 that showed that

early antiretroviral treatment of the seropositive member of a serodiscordant couple can reduce infection of the negative partner by more than 96%. In other words, antiretroviral therapy can be used as a preventive. This raises the aspirational goal, as advanced by former Secretary of State Hillary Clinton, of an AIDS-free generation. We have the tools at hand if we have the courage to use them. However, the cold, hard facts are that of those 34 million people infected with HIV, 15 million urgently need antiretroviral therapy based on a CD4 count of 350. The WHO, just a few days ago, raised the recommendation to treat when the CD4 count is 500. Which means that many, many more, perhaps 23–25 million, people are now in need of antiretroviral therapy. But even with the 15 million we had recognized before, it is fantastic that 8 million of those people are now getting antiretroviral therapy thanks to the President's Emergency Plan for AIDS Relief (PEPFAR) and the Global Fund. The bad news is that 7 million people who urgently need antiretroviral therapy in sub-Saharan Africa still are not receiving it. Also, for every 10 people who are started on antiretroviral therapy, 15 are newly infected. So we don't yet have a truly winning strategy in Africa to curb this. The epidemic continues to expand, albeit more slowly than previously. In addition, there is the issue of dollars. We predict for 2015 that we will need \$26.6 billion to address the needs of HIV/AIDS. It's likely that if

we're lucky, there will be \$8 billion projected in 2015, and that is with the hope that Executive Director Mark Dybul will be successful in the replenishment round at the Global Fund.

But I want to leave you on a strong note, and that note is the introduction of Dr. Alex Coutinho, who is the Sande-McKinnell Executive Director of the IDI at Makerere (Figure 7). He is one of my personal heroes. Alex has, undaunted, led the IDI in so many fantastic ways, including reaching out to rural parts of Uganda, as this is not a disease in Kampala alone. So he has assembled teams. For example, one visited a fishing village with an HIV prevalence of 20%. In fact, the fishing villages are among the highest HIV-prevalence areas in the country. But if you provide access to counseling and testing, people line up in droves (Figure 8). They want help, and they seek help. It's truly amazing how they respond when the IDI rovers come to town, so to speak. I'm pleased to let you know that Alex has been recognized with the 2013 Hideyo Noguchi Africa Prize, along with Peter Piot, for which each will receive an award of \$1 million dollars from the Japanese government, presented by Prime Minister Shinzo Abe. Alex plans not to place that \$1 million in his bank account, but to use it to help Ugandans, through leadership training, to be in a better position to fight infectious disease within their country — one more example of his tremendous leadership.

So, I will leave you with our vision of an Africa free of the burden of infectious disease, with an AIDS-free generation clearly in sight. I would like to thank the Gladstone Trustees for allowing me to be a part of the Accordia Global Health Foundation, and especially past Gladstone president Bob Mahley and current president Sandy Williams. I would like to thank all the people at Accordia, a wonderful group to work with, all my colleagues within the Academic Alliance, and of course the IDI at Makerere University. I would also like to acknowledge Thomas Quinn for sharing various images with me. Thank you very much for your attention.



Figure 8

Ugandans seek HIV counseling and testing.

1. Greene WC. Turning Mondays into Tuesdays in Kampala. Accordia Global Health Foundation Web site. <http://www.accordiafoundation.org/news/turning-monday-into-tuesday-in-kampala/index.html>. Updated October 2004. Accessed October 10, 2013.
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