Innovating for health and development

Hideyo Noguchi Africa Prize

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On 28 May 2008 Brian Greenwood, of London School of Hygiene and Tropical Medicine, and Miriam Were of National AIDS Control Council of Kenya, were awarded the First Hideyo Noguchi Africa Prize.

The presentation ceremony hosted by Prime Minister Yasuo Fukuda was attended by their Majesties the Emperor and Empress of Japan and hundreds of international dignitaries, including more than 40 heads of state and government of the African countries participating in the Fourth Tokyo International Conference on African Development (TICAD IV). The presentation ceremony marked the first day of the TICAD IV held in Yokohama. The day happened to coincide with the "80th anniversary plus one week" of Noguchi's death in Ghana, 21 May 1928.

The best description of the ideals of the Hideyo Noguchi Africa Prize is perhaps the acceptance speeches of the two laureates (excerpts as follows):

"Forty-three years ago, as a young man, I set off on my first visit to Africa to take up an appointment at University College Hospital, Ibadan in Western Nigeria. At that time, this was considered rather a strange thing to do. I had up to that point done well in my medical career in England and some of my seniors in the UK considered that going to work in Africa was bizarre, almost a form of professional suicide for a young physician. This evening is the occasion on which I have finally proved them wrong. The concept underlying the Noguchi Prize is an extremely important one as it establishes the point that what is sometimes considered as rather soft, that is applied or field, research, is as intellectually rigorous and demanding as the high technology laboratory research that, in the past, has usually attracted the international prizes. The establishment of the Noguchi Prize will help to redress this balance and the Japanese Government is to be commended on taking this initiative", (Brian Greenwood)[1].

"Reduction of the disease burden on the people of Africa and improvement of health is crucial for the creation of wealth and improvement of the overall socioeconomic situation in Africa. People who live in poverty and who are frequently sick cannot be productive enough to improve the situation. Africa's history

that includes the massive transatlantic slave trade that disorganized the continent for nearly 500 years followed by colonialism and apartheid for a further 100 years laid the roots of poverty and disempowerment in Africa that casts a long shadow into the present and future. Healthy people, creation of wealth and social stability are some of the requirements for us, the people of Africa, to get out of the indignity in which most of us live. We, the people of Africa, believe that through this forum (TICAD) and the prize outcomes will be positive for Africa", (Miriam Were)[2].

The creation of the prize came out as a typical Koizumistyle *coup de main* during his visit to Africa in May 2006[3]. It was literally a top-down initiative. Nobody at the time actually thought about the meaning, let alone the consequence, of creating yet another prize in the already over-crowded international prize market. However, it turned out that this particular field of science – tropical medicine, public health, or so-called translational research – lacked a proper system of reward which commanded substantial international outreach and legitimacy. It was precisely this area of science and research which warranted particular attention of the international science community if we were to defeat the global health challenges.

Why do we have to constrain ourselves on a specific continent when a global issue like health and medicine is at issue? Because Africa is the continent most in need of resources, financial or otherwise, in order to achieve the United Nation's Millennium Development Goals (MDGs).

These were the founding principles and parameters which determined the framework of the new prize. The prize has set itself a totally different and radical approach on how to recognize, inspire and shape research in a globalizing world.

Before going into the prize further, let us briefly review Hideyo Noguchi, a figure who captivated Koizumi's imagination to conceive this prize.

Who is Noguchi?

Hideyo Noguchi (1876–1928) was a prominent Japanese bacteriologist in the early 20th century, internationally acclaimed for his contribution to the understanding of infectious diseases[4]. Noguchi eventually died in Accra, Gold Coast (now Ghana) of yellow fever while working in search of its pathogen[5]. It is said that the death of his close Rockefeller colleague Dr Adrian Stokes of yellow fever made Noguchi decide to travel to Africa. It was still a decade before the virus was discovered by mankind and ascertained as the pathogen.

Noguchi was born in a very poor family in the impoverished rural village of Fukushima. He had a physical handicap, a deformity on his left hand due to a burn that he suffered during his early childhood. Nothwithstanding these handicaps, he managed to obtain, through extraordinary hard work, a licence to practise medicine in Japan. He did exceptionally well in school but in those days, obtaining higher education, especially in medicine, was expensive and exclusive. The professional horizon of a medical student from a lowly family background without a degree from the Imperial University, could not extend much further than a provincial practitioner. Noguchi was not content to remain in obscurity.

In 1901, at the age of 23, Noguchi moved to the United States and made his way to the laboratory of Simon Flexner at the University of Pennsylvania. In 1904, Flexner was invited to head the newly founded Rockefeller Institute for Medical Research (now Rockefeller University), and brought Noguchi, his most trusted protégé, with him. In the early years in the institute, Noguchi earned the epithet “human dynamo”, not without a racist hue. But by the 1910s he was one of the top researchers leading the institute to world fame comparable to its European counterparts. In those days in the field of medicine (and to a large extent science in general), the United States had been playing the second fiddle to Europe.

His extraordinary appetite for research and zeal to conquer the cause of diseases, brought him to various places in the western hemisphere in Central and South America where the rate of death from yellow fever was particularly high. The Rockefeller Institute for Medical Research had formed a special task force for South America and appointed Noguchi as one of its leaders. In 1918, Noguchi landed on Guayaquil, Ecuador, the epicentre of this disease; his battle against yellow fever thus began. In just nine days, he isolated the pathogen (*Leptospira icteroides*) and produced a vaccine and antiserum, successfully lowering the death rate. Noguchi was worshipped as a crusader against yellow fever in places where he visited: Mexico, Brazil and Peru. However, it was not possible at that time to identify a virus; it did not exist even in people’s imagination. However, Noguchi harboured some doubts about the veracity of his findings and he did record certain observations to this effect true to his academic conscience. That was what motivated Noguchi to set sail for Africa.

A prominent Rockefeller scientist travelling all the way to Africa, notwithstanding various prejudices against a nonwhite, physically handicapped upstart had a tremendous impact worldwide. It is this courage and passion combined with his belief in field-based research that makes Noguchi and his contribution remarkable. And this is the nexus between Noguchi and the newly created prize.

Business model or process of the prize

It is not possible to make a simple comparison between the style of research in the days of Noguchi, when researchers were honoured simply by discovering or isolating agents from patients, and that of the contemporary scene where conditions and requirements have become much more complex. However, the field-based research style of Noguchi is increasing in its value in combating diseases in Africa. There is an atavistic call for simple but high quality research based on practical needs on the ground combined with a deep understanding of the ecological and human factors indigenous to Africa.

In May 2006, Prime Minister Koizumi announced the establishment of the prize in the joint press conference with President Kufuor of Ghana. After returning to Japan, Koizumi instructed the ministries of foreign affairs, health and welfare, and science and education to elaborate on the concept. The Cabinet Office was designated as the coordinating agency and in July 2006, in the Japan-African Union (AU) summit, the prize became the main agenda. In the joint press conference by Prime Minister Koizumi and AU Chairperson Konare it was announced that the prize will be awarded every five years and that the first will be awarded in 2008 within TICAD IV. A cabinet decision was made to that effect.

The latter part of 2006 was consecrated to establishing a truly effective business model or process in order for this prize to be competitive and attractive in the science community as well as pertinent to the global (i.e. African) health needs.

The first demand was to ensure diversity and inclusiveness. Nominations will be sought from around the globe including all the 53 countries in Africa. Africa has often been a non-entity in the science community. By inclusiveness, we do not mean affirmative action. What is needed is a truly fair and equitable playing ground to encourage research of Africa, for Africa, by Africa. The composition of the three selection committees will be international with a balanced representation from various continents[6].

The second demand was to ensure fairness and academic rigour of the selection process. Not only the outcome but also the process through which the laureate is elected should be superlative, that is worthy of the substantial amount of honorarium attached to the prize. Prestige and appeal of a prize is not something which could be bought but only earned by example. For this purpose, two sub-committees were set up to conduct the expert level screening in respect of medical research and medical services. The Hideyo Noguchi Africa Prize Committee, the parent body presiding over the two sub-committees, will finalize the candidates to be recommended to the Prime Minister of Japan for final decision.

The third demand was to ensure relevance of the prize to the health/medical reality on the ground. The "connectivity" of the prize with the people and society of Africa is the core value of the prize. The connectivity is embodied in the financial mechanism too. One half of the honorarium will be financed by the Government of Japan and the other half by donations from the public which will be administered by the Japan International Cooperation Agency (JICA).

What are the main target areas of the prize? The prize will first and foremost vigorously encourage research on the major and most relevant medical and heath issues in Africa. Although dramatic achievements have been made in recent decades in this area, there is still an absolute shortage of awareness beyond the expert community. The prize, by its institutional linkage to the TICAD process and its strong resonance with global health policy, aspires to be a key instrument in addressing the medical as well as public health challenges in this area.

The prize values not only the advancement of our understanding of African diseases in terms of biomedical research in its conventional sense, but also our understanding of the bigger picture in terms of human and environmental ecology surrounding these diseases.

The prize will also give more emphasis on the human and societal aspect of the research or health activities in concern. We do not believe that such an approach will compromise the disciplinary rigour of research or health activities. If anything, this kind of emphasis will lead to a bigger impact in terms of achieving the MDGs more effectively.

Achievements of the two laureates

Nomination requests together with the nomination guidelines were sent out to more than 2000 individuals and institutions, and slightly more than 100 nominations were received.

From February to December 2007, the Medical Research Sub-Committee selected three among 57 candidates. Meanwhile, from June to December 2007, the Medical Services Sub-Committee selected three among 23 candidates. These six candidates were referred to the Hideyo Noguchi Africa Prize Committee for final consideration. In February 2008, the Hideyo Noguchi Africa Prize Committee unanimously recommended Brian Greenwood and Miriam Were as the candidates for the first prize. This was duly approved and announced on 26 March 2008 by the Prime Minister.

Reactions from the international health and research community were cordial and encouraging. The WHO, the World Bank, the Gates Foundation, the Rockefeller Foundation and the Rockefeller University were among those who issued genial statements congratulating the laureates[7].

Brian Greenwood was honoured for his bold and innovative work on malaria. At a time when malaria was spreading uncontrollably across the African continent claiming more than 1 million lives a year, Greenwood contributed to the creation and designing of effective strategies to control malaria. His crucial contributions in malaria research greatly helped developing the tools and knowledge that are essential in turning the tide on this devastating disease. His work brings hope where very recently only despair existed.

Greenwood has spent more than 30 years on site in Africa including 15 years as Director of the MRC Laboratories in The Gambia where he pioneered landmark research contributing to the understanding of the immunology, pathogenesis and epidemiology of malaria, a major killer in Africa, and other infectious diseases such as meningitis and pneumonia, all major contributors to mortality among children in Africa. His research and translational clinical studies, involving simple but high quality methods as well as field trials of drugs and vaccines, have provided the scientific underpinning to a wide range of influential public health policies at national and international levels. His important contributions include:

- Demonstration of the effectiveness of insecticide-treated bed-nets for control of malaria, which is now the cornerstone of malaria interventions throughout the continent, supported and financed by many donor agencies;
- Primary studies on artemisinin-based combination therapies (ACTs), now widely adapted as first-line treatment for malaria;
- Demonstration that malaria chemoprevention reduces child mortality. This is now being applied for intermittent preventive treatment in infants, children and in pregnancy;
- Substantial contributions to trials of malaria vaccines, including the efficacious RTS,S vaccine.

Another important aspect of Greenwood's achievements is his reinvention of field research in tropical medicine – changing it from an ancillary colonial or military activity focusing on hygiene to a multi-partite, multi-disciplinary endeavour, wherein holistic solutions are required – based on cutting-edge science and a genuine understanding of the complex eco-system as well as real-life challenges unique to Africa. Thus laboratory and clinical research, preventive and curative medicine, epidemiology, anthropology, and behavioural research were all brought together. These modern approaches which we now take for granted

came from Greenwood's prescience and leadership.

Over the years, Greenwood has made capacity building – another lasting legacy of his research based on African soil – a central objective including the training and support of young African scientists. A cohort of students, doctors and clinicians who developed their careers under Greenwood's inspirational mentorship has immensely contributed to the increase in stature of medical research in Africa amongst the scientific community in general.

Under the medical services category, the inaugural award went to Miriam K Were, whose efforts to bring basic medical services and health rights to women and children in the villages of East Africa has been a beacon of hope for millions of people in Africa and the world. Through her work with African Medical and Research Foundation (AMREF)[8] and UZIMA Foundation[9], Were has been a source of inspiration for all people on the African continent.

For the past 40 years, Were has dedicated her life to advancing the health and welfare of the people of Africa through a focus on the practicalities of delivering service at a local level. She has united communities to develop and implement innovative solutions to quotidian health problems.
The most illustrious example of her community-based approach is her ongoing work to build public toilet facilities in local communities, improving hygiene and overcoming longstanding taboos. She also drastically raised the infant vaccination rate by organizing children into small groups to visit local clinics. Her innovation and systemic precedents have had enduring impacts not only in Kenya but throughout the East African region and across the entire continent, through her engagement with the African Union and as a key health adviser to the African Heads of State on AIDS, tuberculosis and malaria.

Her style of work through the direct engagement of the youth, sex workers, intravenous drug users, homosexuals and others to encourage openness and frank discussion on sexuality and HIV/AIDS has galvanized communities in Kenya and contributed to the reduction of stigma and discrimination against people living with HIV/AIDS. She is a dedicated advocate for vulnerable populations, especially the poor and the marginalized. She is also committed to the empowerment and development of all voices across lines of sex, tribe, and age and class background. Widows and orphans severely affected by HIV/AIDS are amongst those most positively touched by her contribution to expanding access to medical services.

We would also like to pay tribute to the families, particularly the spouses, of the two laureates whose continuing support and understanding for the harsh working environment of medical profession/career in Africa has been instrumental to realise these achievements. The importance of these familial ties came home to all of us during the flower presentation ceremony by the children of the alma mater of Hideyo Noguchi in Fukushima when Alice Greenwood (wife of Brian Greenwood) and Humphreys Were (husband of Miriam Were) hugged each other in tears congratulating each other's enduring assistance over the years.

Conclusion

The prize is a unique call to marshal the multitude of activities on research and service delivery in the field

of health transpiring on the African continent – a continent most in need of resources and care but often marginalized and neglected – and eventually to transform the way in which the international community addresses medical and health issues on Africa.

Japan as Chair of G8 this year, which is incidentally the year of TICAD, is leading the efforts to harness the surging enthusiasm of the international community on the health agenda[10]. The Japanese government considers the Hideyo Noguchi Africa Prize mechanism to be an integral part of this policy context.

Health and medical interventions tend to be subject to the whim of pity. Of course, health matters are by nature humanitarian. However, we need to conscientize the public that charity is not sufficient to roll back the overwhelming health challenge in Africa. We need to encourage robust science and research in Africa. Science should not be a monopoly of the developed world. Research on African health cannot be truly meaningful or sustainable unless it is owned by Africans.

The following excerpt from an article by Professor Makgoba, Vice-Chancellor of KwaZulu Natal University, perhaps best captures the African hope and expectations.

"Major international prizes that have shaped modern medical scientific advancements such as the Nobel Prize, have the thrust on individualistic scientific achievements without a direct link to society or a focus on global health burden. For these reasons they have advanced science and health research in a particular, esoteric way; have become prizes of the elite and advantaged science and scientists of the developed world; and have been detached from real global health problems. As a result, while prestigious, in reality they have been exclusive and insensitive to the health realities of the developing world. Often the processes and structures of their decision-making have been shrouded in secrecy and have lacked diversity and internationalism. It will be interesting to see how these established awards rise to the challenges of the modern world and in particular to the impact of this newly launched Hideyo Noguchi Africa Prize."

We wish to acknowledge our indebtedness to each and all of the three selection committees in particular the three chairpersons for their intellectual and moral support throughout the process. We must also record our deep gratitude and almost thunderstruck admiration for Junichiro Koizumi for his sense of mission which constantly motivated and inspired us to make this concept a reality*. _

**The opinions contained herein do not necessarily represent the views or policies of the Government of Japan.*

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References

1. See acceptance speech by Brian Greenwood at the Presentation Ceremony, 28 May 2008 (http://www.cao.go.jp/noguchisho/jyusyousiki-sikisidaie/greenwood-e.pdf).

2. See acceptance speech by Miriam Were at the Presentation Ceremony, 28 May 2008 (http://www.cao.go.jp/noguchisho/jyusyousiki-sikisidaie/were-e.pdf).

3. See address by Junichiro Koizumi to the Nippon Keidanren (Confederation of Japanese Business), 4 July 2007 (http://www.cao.go.jp/noguchisho/bokin/aisatsu-e.pdf).

4. Noguchi's major research achievements could be summarized as follows:

1. Discovery of *Treponema pallidum*, the causative agent of syphilis, in the brains of progressive paralysis patients (1913).

2. Success in growing pure culture of *Syphilis spirochete* (1911), however, no one has succeeded ever since in the replication of pure culture of *Syphilis spirochete*.

3. Proves that both Oroya fever and Verruga peruana are caused by a single pathogen *Bartonella bacilliformis* by verifying that *Bartonella bacilliformis* invades red blood cells in both cases (1926).

4. Observation of *Leptospira icteroides* from patients of yellow fever (1919). (Leptospira, which was then identified as the cause of yellow fever by Noguchi, was later disproved and proved to be in fact the spirochete of Weil's disease. His name is remembered in the binomial leptospira noguchi in the classification of spirochetes.)

The number of research papers written by him reached almost 200 and various kinds of infectious diseases came under the scope of his interest, varying from study of pathogens and immunology to development of vaccine and experimental technique. Noguchi was three times nominated as a Nobel-Prize candidate in the period 1914–1920.

5. The Noguchi Memorial Institute for Medical Research was established in 1979 and named after Hideyo Noguchi who died from yellow fever in 1928, the very same disease he was researching into (http://www.noguchimedres.org/).

6. The nationality of the members of the Hideyo Noguchi Africa Prize Committee is as follows: 8 Japan, 1 UK, 1 USA and 1 Senegal. See the following for details: http://www.cao.go.jp/noguchisho/iinkai/iinmembere.html

The nationality of the members of the Sub-Committee for Medical Research is as follows: 19 Japan, 1 France, 1 Mexico, 1 USA, 1 Ghana and 1 Australia. See the following for details: http://www.cao.go.jp/noguchisho/iinkai/medicalresearch-e.html

The nationality of the members of the Sub-Committee for Medical Services is as follows: 3 Japan, 7 African (Mali, Nigeria, Gambia, South Africa, Côte d'Ivoire, Zambia and Mozambique), 1 Mexico and 1 USA. See the following for details: http://www.cao.go.jp/noguchisho/iinkai/medicalservice-e.html

7. See for example the following statements and press releases:

WHO: http://www.who.int/mediacentre/news/releases/2008/pr10/en/World Bank: http://web.worldbank.org/WBSITE/EXTERNAL/NEWS/0,,contentMDK:21701357~pagePK:34370~piPK:34424~theSitePK:4607,00.html

Rockefeller University: http://newswire.rockefeller.edu/?page=engine&id=736

Gates Foundation: http://65.117.201.112/GlobalHealth/Announcements/Announce-080326.htm

8. Professor Were serves as a Chairman, International Board of Directors of the African Medical and Research, Foundation, AMREF from February 2003 to date (www.amref.org).

[9] Professor Were was Founding Chairperson up to 2001 and is a Member of the Board of Trustees of the UZIMA Foundation to date. The Foundation is a charitable trust registered in Kenya (http://uzimafoundation.org/main/).

[10] See for example the following report by the G8 health experts group: http://www.g8summit.go.jp/doc/pdf/0708_09_en.pdf

[11] See following commentaries and reports by the author Kiyoshi Kurokawa:

http://www.bdafrica.com/index.php?option=com_content&task=view&id=1726&Itemid=5821

http://www.kiyoshikurokawa.com/en/2008/04/announcement-of.html

http://www.kiyoshikurokawa.com/en/2008/05/hideyo-noguchi.html