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INNOVATION BEYOND INDIVIDUALISM

During clinic hours at the Hospitalito Atitlán, Tz'utujil Maya patients arrived in droves, often accompanied by extended family and friends. Relatives endured the long queues and cramped wooden benches, breathing the sterile yet smoky scent of donated medical supplies and wood fire. While volunteering in this small Guatemalan hospital, I discovered that families and communities, rather than lone individuals, collectively made health decisions. A costly medical procedure might mean that family members would ration food for a month or that neighbours would loan part of their earnings to help fund the treatment. To an aspiring physician raised with principles of autonomy and individualism at the forefront, these examples of family decision-making are reminders of the power of social solidarity and consideration of the greater good. From remote communities in Guatemala and Kenya to laboratories in urban universities, I have learnt how a narrow focus on the individual can often be detrimental to the health of all.

Modern innovators live and work in a culture of competition and individualism. Early in our lives, institutionalized educational structures ingrain in us principles of independence and individuality. Research paradigms promote discovery and individual ownership, while habitually neglecting long-term follow-through and adaptation to local contexts. Biomedical innovations often target individual problems with specific drugs and technologies but fail to appreciate the interconnectedness of health and society, of illness and environment. In order to improve the health of all, we must shift away from individualism and work collaboratively to address human health in the broadest context.

Individualistic thinking emerges from our competitive educational and work environments. I am reminded of the disappointed faces of Kenyan primary school students whose parents punish them for a poor class ranking, or my young cousins in Hong Kong who agonize about university admission and whose numerous homework assignments include the memorization of entire books. I succumb to competition as well. I recall envying the machine-like discipline of the chemists who persisted in working after all-night experiments and were visible through the laboratory windows I passed while walking home in the brisk dawn mist, exhausted after countless hours in my university's main library.

We train innovators to love ownership of publications and patents, like corporations in pursuit of profits and wealth. My principal investigator in a Los Angeles medical centre instigated a gag order on our laboratory's recent experiments during an epigenetics conference so that none of his colleagues would "steal" the publication. While analyzing our data, laboratory members were encouraged to manipulate statistical methods until the desired result was achieved. Individuals rush to be the

first to discover a cure or to develop a model intervention, even at the expense of moral principles. This intense drive for ownership spawns unnecessary competition among individuals and hinders collaboration.

In the global health scene, fierce competition for the implementation of innovations exists. When numerous Kenyan nongovernmental organizations (NGOs) aggressively compete for funding to operate similar HIV programmes, they frequently focus on their own gain rather than on benefit to the local community. I recollect the accusatory shouts of feuding Kenyan health employees of the government and three NGOs, who all worked under the same corrugated iron roof. The global explosion of new NGOs in the past decade demonstrates that many yearn to be leading innovators, but few intend to be followers. Many covet ownership of ideas and projects, but few care to share the credit. In order to improve the health of all, innovation requires teamwork and collaboration rather than individualism.

Because of the intense drive for discovery, we often overlook sustainability and sufficient follow-through. The introduction of new health campaigns generates early excitement, but the day-to-day maintenance of a long-term project requires humility and silent dedication, qualities not always rewarded in our competitive environment. The World Health Organization's ambitious Global Malaria Eradication Programme is a prime example. When it was inaugurated in 1955, initial interest in the campaign led to the eradication of malaria in many temperate countries and reductions of cases in India, Sri Lanka and other tropical countries; however, faltering funding and lack of community participation weakened the programme's mission. Without sufficient follow-through, drug-resistant parasites and insecticide-resistant mosquitoes emerged. The World Health Organization abandoned the eradication campaign in 1969 as new cases in the tropics rebounded. Four decades later, over half the world's population lives at risk of malaria, and every year brings half a billion clinical cases claiming 1 million lives. Priorities have shifted, and philanthropist Bill Gates famously cites the fact that we currently devote more money to finding a cure for baldness than to developing drugs to treat malaria. In order to improve the health of all, global health innovations require sufficient long-term follow-through.

In addition to lacking follow-through, current technologies and innovations regularly overlook the importance of local contexts. We must adapt innovations to particular social, cultural, political, physical and economic environments. One-size-fits-all solutions, like donated clothing, simply cannot fit everyone. When newly constructed birthing centres exclude the presence of local midwives, and when health clinics forbid the use of herbal medicines, biomedical innovation ignores local values, mores and traditions.

While researching potable water issues in the western highlands of Guatemala, I learnt how technologies can fail if not properly introduced into a unique cultural environment. At the height of the Guatemalan civil war in the early 1990s, a cholera epidemic swept through the town of Santiago Atitlán, necessitating treatment of the tap water drawn from the azure shores of the adjacent lake. The municipal government, advised by international aid organizations, selected chlorination as the method of treatment, giving the water an astringent taste and a chemical smell. Many distrustful residents began to believe the caustic water had been poisoned by the government or contaminated by the dead bodies of missing Tz'utujil Maya,

purportedly dumped in the lake by the military. To this day, several Tz'utujil Maya still associate the taste and smell of chlorine with dead bodies in Lake Atitlán and refuse to drink the municipal tap water. Despite their enormous humanitarian potential, global public health innovations can fail without proper integration into unique cultural environments. In order to improve the health of all, novel innovations must be informed by local expertise and introduced in a culturally flexible way.

Understanding the broader cultural context is only one step towards expanding our conceptions of innovation. Drugs for specific syndromes and technologies for particular procedures improve health, but innovation must also address larger structural issues like lack of sanitation and clean water. During the rainy season in western Kenya, when insects and wild vegetables abound, I travelled to Mfangano Island to research food security among people living with HIV. The Ministry of Health clinic provided free antiretroviral therapy (ART) for residents living with HIV, a third of the island's population; however, the Suba people lacked access to clean water, sanitation infrastructure, paved roads or electricity. Without knowledge of sustainable agriculture techniques, residents produced poor harvests while problems of famine and hunger plagued the island.

Pulitzer Prize-winning author Tracy Kidder recounts an adage from Haitian health workers, who say that giving people medicine for tuberculosis and not giving them food is like washing their hands and drying them in the dirt. Indeed, while interviewing people on ART, I learnt that they often skipped their treatment due to hunger. As a Kenyan client explained, "If you take antiretrovirals on an empty stomach, they just burn. Some days, the hunger is so unbearable I simply skip taking the drugs and do not tell anyone." Dozens of interview respondents echoed these sentiments: starving while on ART is an excruciating experience.

Examples of hunger and ART in Kenya, poorly implemented water interventions in Guatemala, and laboratory competition in the United States all demonstrate why we must expand our narrow conceptions of innovation. Medical anthropologists Ann McElroy and Patricia Townsend write, "Patchwork solutions to provide a drug or other intervention to target a particular pathogen or bodily defect will never be sufficient to promote health for all, for the locus of health is not the individual body but the relationships". We need a paradigm shift that de-emphasizes our culture of competition and individualism and, instead, promotes teamwork and understanding. I foresee a future where support for people living with HIV will not be limited to ART, but will include nutritional nurturance and sustainable strategies for agriculture to address hunger holistically. I imagine intra- and interdisciplinary innovation where laboratory scientists collaboratively conduct experiments, NGOs negotiate with one another to share resources, anthropologists adapt interventions in culturally appropriate ways, clinicians counsel on prevention and treatment, and educators empower with practical and theoretical knowledge. Like the Maya of Guatemala, we should learn to think collectively for the greater good, caring for others through solidarity as though they were family. Only through collaboration and a broadening of our focus on individual innovations will we truly achieve health for all.

Jason Nagata grew up in Monterey Park, California, and attended the University of Pennsylvania, where he majored as an undergraduate in Health and Societies and the Biological Basis of Behavior. The recipient of a Thouron Scholarship, he earned a Master of Science degree in Medical Anthropology at the University of Oxford and begins medical school at the University of California, San Francisco in autumn 2009. His passion for global nutrition led him to the World Health Organization, where he interned with the Department of Nutrition for Health and Development. He has also worked in the western highlands of Guatemala, conducting and publishing biocultural nutrition research through the Guatemala Health Initiative. In western Kenya, he has worked on food insecurity among patients on ART through the Organic Health Response.