

REVIEW TOPIC OF THE WEEK

# Building Sustainable Capacity for Cardiovascular Care at a Public Hospital in Western Kenya



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## ABSTRACT

Cardiovascular disease deaths are increasing in low- and middle-income countries and are exacerbated by health care systems that are ill-equipped to manage chronic diseases. Global health partnerships, which have stemmed the tide of infectious diseases in low- and middle-income countries, can be similarly applied to address cardiovascular diseases. In this review, we present the experiences of an academic partnership between North American and Kenyan medical centers to improve cardiovascular health in a national public referral hospital. We highlight our stepwise approach to developing sustainable cardiovascular services using the health system strengthening World Health Organization Framework for Action. The building blocks of this framework (leadership and governance, health workforce, health service delivery, health financing, access to essential medicines, and health information system) guided our comprehensive and sustainable approach to delivering subspecialty care in a resource-limited setting. Our experiences may guide the development of similar collaborations in other settings. (J Am Coll Cardiol 2015;66:2550-60) © 2015 by the American College of Cardiology Foundation.

*"If you want to walk fast, walk alone.  
If you want to walk far, walk together."*

—African Proverb

**A**lthough cardiovascular disease (CVD) remains the leading cause of death worldwide (1), significant gains in treatment have been

made over the last 4 decades. Since the 1970s, the rate of death from CVD has declined most dramatically in high-income countries (2). One-half of the decline has been attributed to the rapid dissemination of coronary care units and radical reorganization of cardiac care, centralizing acute CVD patients in 1 location in the hospital (3). Nevertheless, gains in cardiovascular

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health have not been realized equitably around the globe. The Global Burden of Disease Study estimated that 80% of deaths from noncommunicable diseases, including CVD, now occur in low- and middle-income countries (1). Between 1990 and 2013, there was an 81% increase in the number of CVD deaths in sub-Saharan Africa; significantly, 70% to 80% of these deaths could have been averted with the availability of critical or specialty care (4). The epidemiological transition of CVD burden in low- and middle-income countries has garnered international attention, emboldening the World Health Organization's "25 × 25" goal of a 25% reduction in mortality from noncommunicable diseases by 2025 (5).

Despite these recent positive trends, historically, most global health funding has not been applied to the treatment of acute or chronic CVD, but rather, to infectious disease care (6,7). Noncommunicable diseases account for 9× the number of deaths worldwide, but receive 300× less funding than human immunodeficiency virus (HIV)/acquired immunodeficiency syndrome (AIDS) (8). In sub-Saharan Africa, the percent of total spending on HIV now exceeds the percent burden of HIV-related deaths and disability (9). In Kenya, cardiovascular and circulatory diseases constitute 8.2% of all deaths (1) and cause the highest inpatient case fatality rate (10). Cerebrovascular disease (3.9% of all deaths), ischemic heart disease (2.4%), cardiomyopathies (0.5%), hypertensive heart disease (0.5%), and rheumatic heart disease (0.3%) were the most common causes of cardiovascular and circulatory disease deaths in Kenya in 2010 (1). Nonetheless, HIV/AIDS accounts for >60% of the total health spending costs (11). As a result, only 27% of public health centers in Kenya are equipped with the necessary supplies to treat CVD, access to cardiologists is limited, and absenteeism of all levels of providers is commonplace (12).

Given these observations and an opportune research investment from the National Heart, Lung, and Blood Institute (NHLBI), we leveraged a long-standing multi-institutional collaboration with Moi University and Moi Teaching and Referral Hospital (MTRH) in Eldoret, Kenya (Figure 1) to ambitiously tackle the shortage of specialists and infrastructure necessary to address the rising burden of CVD. On the basis of a collective interest among academic partners and MTRH in focusing on CVD care, and using the World Health Organization's Health Systems Strengthening Framework for Action (13), we highlight our innovative partnership and the developmental milestones that created the foundation for a sustainable model for improved CVD care in the public sector (Figure 2).

## PROLOGUE: CARDIOVASCULAR CARE SERVICES IN WESTERN KENYA, CIRCA 2008

MTRH is the second major public referral teaching hospital in Kenya, serving approximately 25 million people. The hospital has an 800-bed inpatient capacity; a busy casualty/emergency department; and medical, surgical, pediatric, maternal, and outpatient clinic facilities providing care to more than 600,000 patients annually. MTRH's stated mission is to provide quality health care services and teaching facilities through research, training, capacity building, innovation, and participation in national health planning. Yet, in 2008, CVD patients had limited options; MTRH had only a 6-bed medical-surgical intensive care unit, and no adult cardiologists. A pediatric cardiologist ran a half-day pediatric cardiology clinic, whereas general internists staffed the adult cardiac clinic. Diagnostic equipment included 1 electrocardiogram machine, a treadmill, and an echocardiogram machine (HP Sonos 2500 [Hewlett Packard, Palo Alto, California])—all nearing the end of life. There were no monitored beds or defibrillators outside of the intensive care unit and operating rooms. There were no trained cardiac nurses, and there was no formal training for echocardiography technicians. Even routine diagnostic tools, such as portable chest x-ray and ultrasound machines, were often unavailable, and stock-outs of medications and laboratory reagents were frequent.

## THE SPARK: ACADEMIC MODEL PROVIDING ACCESS TO HEALTH CARE CONSORTIUM AND THE NHLBI'S GLOBAL HEALTH INITIATIVE

In hopes of responding to the burden of CVD, the NHLBI and the UnitedHealth Group launched the Collaborating Centers of Excellence (COE) program in 2009 to establish cardiovascular and pulmonary disease clinical research centers in low- and middle-income countries in partnership with institutions in high-income countries (14,15). Moi University School of Medicine and Duke University were funded to create 1 of the 11 NHLBI COEs (16) in Kenya. The Kenya COE was built upon a robust 22-year collaboration of academic medical centers, called the Academic Model Providing Access to Healthcare (AMPATH) Consortium (17). Each academic partner in the Consortium commits to "lead with care" in its area of expertise, enhancing local care through educational exchange, infrastructure development,

## ABBREVIATIONS AND ACRONYMS

<b>AIDS</b> = acquired immunodeficiency syndrome
<b>AMPATH</b> = Academic Model Providing Access to Healthcare
<b>CCU</b> = Cardiac Care Unit
<b>CDU</b> = Cardiovascular Diagnostic Unit
<b>COE</b> = Centers of Excellence
<b>CVD</b> = cardiovascular disease
<b>HIV</b> = human immunodeficiency virus
<b>MTRH</b> = Moi Teaching and Referral Hospital
<b>NHLBI</b> = National Heart, Lung and Blood Institute

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