WORKFORCE CONNECTIONS

KENYA HEALTH SECTOR LABOR MARKET ASSESSMENT

May 2015

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CONTENTS

FIGURES

INTRODUCTION

Over the last decade, Kenya has made impressive efforts to strengthen its healthcare workforce, including widening the pipeline of health training and education, and ridding the system of "ghost workers."[1] Kenyan health care facilities are considered among the best in the region, and Kenya is the preferred evacuation destination for medical emergencies throughout most of East and Central Africa. The country could better leverage this preferred market position by launching a determined effort to become a major medical tourism attraction hub in the region, and representatives from the private and public sectors and the donor and NGO communities have formed a working group and produced a draft health tourism strategy.[2] The primary beneficiaries of medical tourism expansion are likely to be private hospitals and clinics which are generally in a better position to adapt to the demands of foreign patients. If expansion of medical tourism leads to job growth and skills upgrading (including spillover effects into domestic healthcare), Kenya may serve as an example for other countries.

However, the country continues to face serious unmet healthcare human resources needs. The World Health Organization's (WHO) recommended minimum staffing levels are 36 doctors and 356 nurses per 100,000 population; as of 2012, Kenya had an average of 19 and 173, respectively.[3] Additionally, the WHO has found that countries that do not have at least 2.28 doctors, nurses and midwives per 1,000 residents are unable to achieve 80% coverage of births by a skilled birth attendant (a minimum desired coverage level and a Millennium Development indicator). In 2010, Kenya had 0.93 health workers per 1,000 residents[4], and in 2009, just 44% of births were attended by skilled health staff, a statistic which actually slightly decreased since 1993.[5] The country's overall health worker to population ratio is 43% below the WHO benchmark.

Such benchmarks can obscure more nuanced information about the supply of qualified health care workers in Kenya. For example, FHI 360's field research indicates that due to working conditions, nurses posted to rural regions are constantly applying for new positions in urban areas, thus creating an appearance that there is an over-supply of qualified nurses. At the same time, there appear to be many unemployed health care workers.

Maldistribution is also a problem: one recent study found a 15-fold variation in the nurse-to-population ratios across the country. Despite the shortage of doctors, as many as 40% of all graduates end up not practicing medicine, as opportunities in other fields are more lucrative, compared with the perceived drudgery of long hours at internships and residencies or rural

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[1] Previously, up to 20 percent of the healthcare workers on payroll were not accounted for. Workforce Connections, Kenya Youth Assessment, FHI 360, March 2015. https://d3n8a8pro7vhmx.cloudfront.net/fhi360/pages/348/attachments/original/1427227963/Kenya_Youth_Assessment_Final_Report.pdf?1427227963

[2] Kenya Medical Tourism Working Group. (2014). Kenya Health Tourism Strategy Draft.

[3] Republic of Kenya, Health Sector Working Group Report, MEDIUM TERM EXPENDITURE FRAMEWORK (MTEF) FOR THE PERIOD 2013/14-2015/16, October 2012, http://www.who.int/pmnch/media/events/2013/kenya_mtef.pdf

[4] Africa Health Workforce Observatory, WHO, http://www.hrh-observatory.afro.who.int/en/country-monitoring/65-kenya-monitoring.html

[5] Millennium Development Goals Indicator 5.2, Proportion of births attended by skilled health personnel. http://mdgs.un.org/unsd/mdg/SeriesDetail.aspx?srid=570

postings that fresh graduates face. Furthermore, female doctors – who are more likely to pursue certain specialties such as pediatrics[6] – may not be as mobile after marrying and starting a family, and be less likely to be willing or able to practice outside of urban areas during this part of their careers.

Our analysis indicates that government and donors do a disservice to the system by characterizing these issues as a mere "shortage". The education and training system is actually graduating large and growing numbers of health workers – but their output is not coordinated with the demands of the health economy. The (admittedly still significant) numerical shortfall of trained workers is magnified by failures in the recruitment and retention system, which result in maldistribution and huge inefficiencies in investment into training new workers -- meaning that, for some cadres, two to three workers must be trained in order to keep one. In the field of systems thinking, the term for this dynamic is a "fix that fails".[7]

Demand-side analysis of the health sector is not typical – but it provides a critical perspective and, we argue, a powerful tool for addressing these issues. In an effort to better understand the challenges of the relevance of health training to employers' needs, and the retention and distribution of high-quality human resources in health in Kenya, in this report we sort the country's health care delivery system into models serving different market segments, allowing us to more effectively "back into" potential interventions in the private, public, and education/training sectors which may improve the alignment of skills supply and demand Kenya's health-related industries.

Much of the anticipated growth in need for health care human resources in the coming years will be in smaller towns, as Kenya's devolution process is intended to spur additional investment in primary care facilities and shift the responsibility for hiring health workers to the county level. As a result, health care human resources development must focus not just on production of workers but also on working conditions, professional development opportunities, and other supports which can help attract, motivate and retain well-trained, competent workers in non-urban areas – factors which have been largely unexamined to date.

▶ OBJECTIVES AND METHODOLOGY

In this study, we examine market dynamics influencing the demand for health and health-related sector workers in Kenya, as well as working conditions and other factors influencing supply. Drawing on existing assets and tools under the Workforce Connections project, and available data sources including the Kenya Health Workforce Information System and the Global Trade Atlas, the study presents novel visualizations of demand and supply data and economic trend analyses. We also look at the demand for skills in the pharmaceutical value chain. This knowledge

[6] P. Mwachaka & E. Mbugua, Specialty preferences among medical students in a Kenyan university, *Pan African Medical Journal*, *5*(1), 2010.
[7] Donella Meadows, *Thinking in Systems: A Primer*, Chelsea Green: White River Junction, Vermont, USA, 2008.

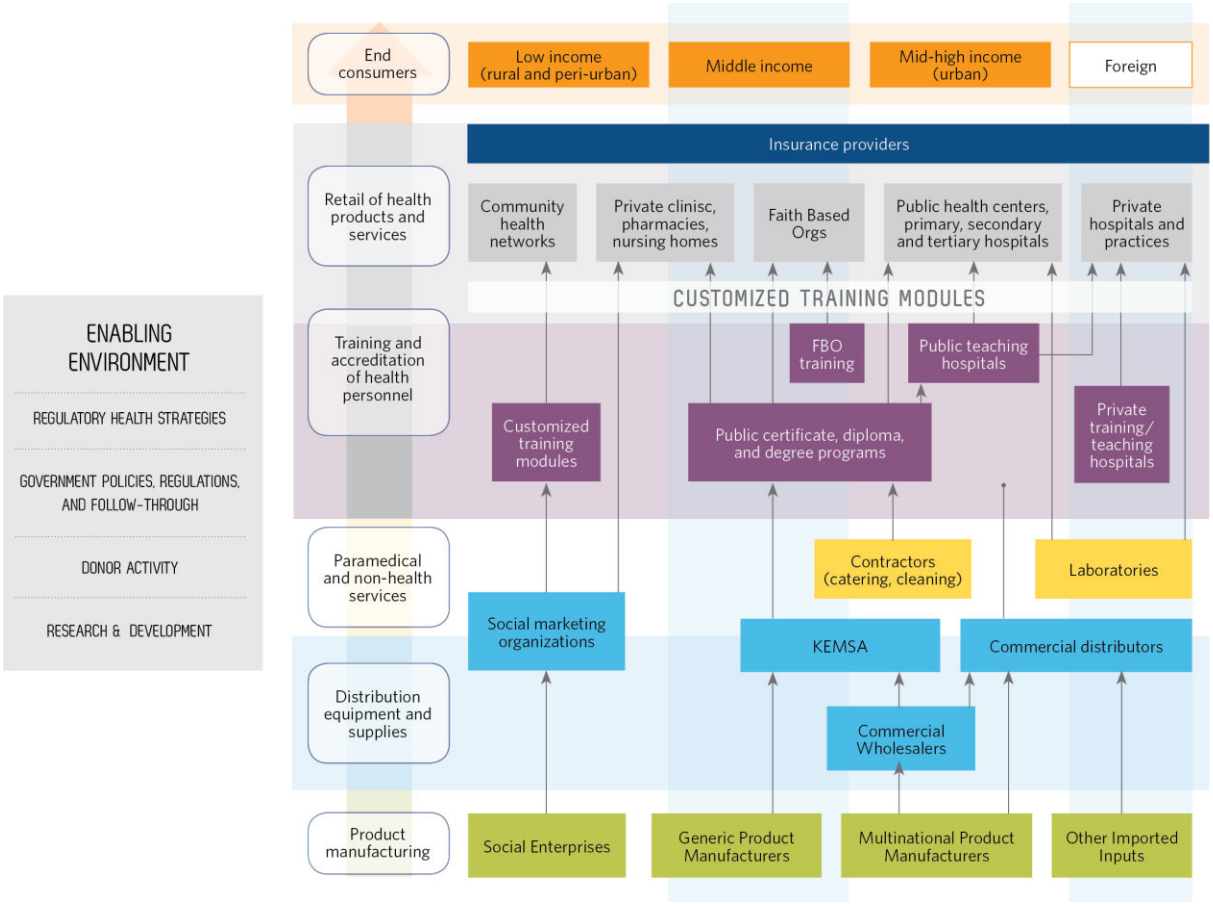
can help stakeholders align development of health care human resources with current and future needs, reducing the severe shortage of qualified, motivated and competent health workers, and increasing the access of underserved communities to crucial health services.

The study, supported by Johnson & Johnson, builds on a national youth assessment conducted in 2014 by the Workforce Connections team for USAID/Kenya. Information and analysis from the initial assessment, including a brief overview of the health sector, served as an impetus for this study and a basis for the research. Members of the assessment team, whose technical specialties include workforce development, economic development, value chain analysis, and labor economics, conducted desk research for several weeks prior to departure, relying on secondary data sources and reports. The team also conducted a stakeholder mapping exercise to identify key informants, and contacted those individuals and organizations to arrange meetings. During the field work team members identified, interviewed and collected statistical and administrative data from key organizations and individuals, including training institutions, pharmaceutical and private health care industry representatives, health administrators, international organizations and NGOs, Ministry of Health (MoH) officials, trade unions, professional associations and oversight councils. The team also carried out visits to public (primary) and private (tertiary) health facilities. A full list of interviewees appears in Annex I. Team members verified preliminary findings with stakeholders in weeks 4, 6 and 16 and carried out quantitative and qualitative analysis of data and information through weeks 4-20.

THE HEALTH ECONOMY

Figure 1 represents Kenya's Health Economy in a value chain format, with channels ranging from health services for low-income users on the very left, to those for foreign consumers – mostly foreign employees of multinational companies and international organizations, in addition to medical tourists, both groups coming from elsewhere in the region -- at the right. The horizontal bands, from bottom to top, indicate the processes which add value to the product or service at each stage, until it reaches the end consumer.

Figure 1: Kenya's Health Economy



The private sector plays a significant role in Kenya's health economy, accounting for 43% of facilities[8], delivering 49% of services[9], and employing 60% of health workers.[10]

Social enterprises, shown at bottom left in the diagram, are business operations with social or environmental objectives which significantly modify their commercial orientation.[11] In Kenya's health sector, manufacturers include organizations such as Zana Africa, which produces and distributes affordable sanitary pads appropriate for low-income environments.[12] Elsewhere in the product supply chain, organizations like Sproxil[13] seek to combat counterfeit drugs by verifying their authenticity through mobile technology. Health care services providers are also well-represented among social enterprises, such as Melchizedek Hospital, which uses cross-

[8] J. Barnes, B. O'Hanlon, F.I. Feeley, K. McKeon, N. Gitonga, & C. Decker, Private Health Sector Assessment in Kenya, World Bank Publications, 2010

[9] T. Marek, C. O'Farrell, C. Yamamoto & I. Zable I, "Trends and opportunities in public-private partnerships to improve health service delivery in Africa," Africa Region Human Development Working Paper series, World Bank: USA, 2005.

[10] A. Arur, S. Sulzbach, J. Barnes, B. O'Hanlon & D. Altman, "Strengthening health systems by engaging the private health sector: promising HIV/AIDS partnerships," USAID HIV/AIDS Policy Brief. Abt Associates Inc: Maryland, USA, 2010.

[11] Eliada Griffin-EL, Emily Darko, Rachel Chater and Shirley Mburu, "A case study of health and agriculture social enterprises in Kenya," Overseas Development Institute, March 2014

[12] http://www.zanaafrica.org/

[13] http://www.sproxil.com/

subsidization to provide comprehensive, affordable and accessible hospital-based healthcare to low- and middle-income groups. In the realm of financing, organizations like Changamka Microhealth are teaming up with the Ministry of Health to use mobile phones to provide care e-vouchers to low-income expectant mothers.[14]

Social marketing organizations market products and services using a business-oriented or value chain approach – examples in Kenya's health sector include the USAID-supported, FHI 360-implemented Gold Star Network, which provides member private health care providers with access to drugs, laboratory testing, training and education, and mentorship.[15]

Atypically for value chains, the map shows training and accreditation of health personnel, a critical input to the health economy and a focus of this assessment. A variety of different types of health education and training institutions and programs exist in the Kenyan health economy, and there are a number of pathways for individuals from health education and training into the labor market, including (but not limited to) the channels depicted here, as will be discussed later.

In the interest of clarity, this diagram does not attempt to exhaustively depict the entire health economy. For example, multinational product manufacturers (shown bottom center) are present in many areas of the health economy, including social marketing and financing, as well as training.

KENYA PHARMACEUTICAL VALUE CHAIN

The pharmaceutical value chain represents one of the best opportunities to create new employment for undereducated youth in the health economy. While most positions in hospitals and healthcare facilities require one or more years of post-secondary education, much of the pharmaceutical value chain is dedicated to distribution, and many of these positions can be filled by persons with less than a secondary education.

Access to medicine is another important challenge facing Kenya's healthcare system. Treatment for the three leading causes of outpatient morbidity (malaria, HIV/AIDS, and tuberculosis), for example, are highly dependent on availability of appropriate medicines, and under accessibility we need to consider not simply physical availability but also cost, quality, and appropriateness of dosage and treatment.

The pharmaceuticals value chain map (see Figure 3) provides some insights into how the system currently functions, as well as the workforce implications. The state corporation Kenya Medical Supplies Authority (KEMSA) dominates the landscape, purchasing roughly 30% of the medicines distributed in Kenya. KEMSA provides medicines mainly to Kenya's public hospitals, clinics and dispensaries, although some private hospitals as well as faith-based and NGO-run health facilities also purchase from KEMSA.

[14] http://changamka.co.ke/
[15] http://www.goldstarnetwork.org/

Other organizations such as Mission for Essential Drugs and Supplies (MEDS) and Kenyatta National Hospital (KNH) are large enough to procure their medications in bulk. MEDS provides mainly to faith-based organizations and some donors. As of 2010, KEMSA appeared to be the most cost-effective, although MEDS and KNH were quite competitive and even less expensive for a number of specific drugs.[16]

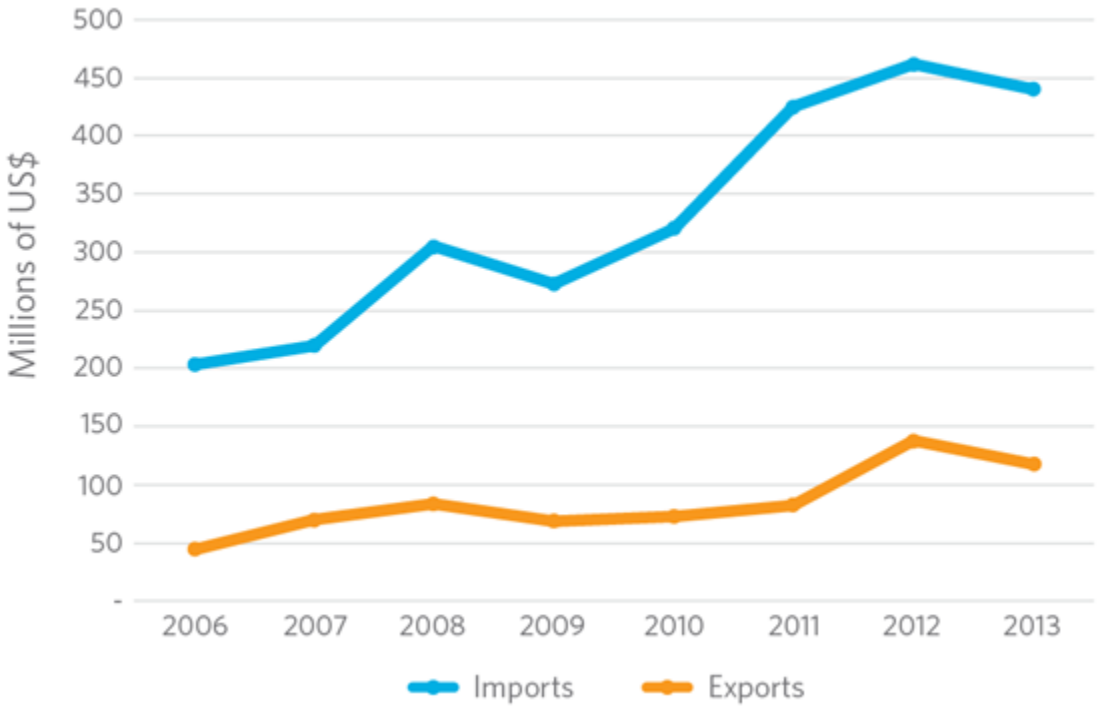
KEMSA is required to do its own product testing using the National Quality Control Laboratory (NQCL) while private sector manufacturers use private laboratories. In fact, many of the tests required by the Pharmacy and Poisons Board (PPB), such as bioequivalence, cannot currently be conducted by any laboratories in Kenya, requiring relatively expensive arrangements with foreign laboratories, adding significantly to the cost and delays for approval of drugs.

Counterfeiting and smuggling are endemic, and there are estimated to be over 3,000 unregistered outlets selling these products[17] as well as medications that have exceeded their expiration date.

The most important medications for Kenya, both in terms of cost and morbidity, are used to treat malaria, tuberculosis and HIV/AIDS. Imports come primarily from India, Belgium, United States and China, which account for 65% of total imports. The top four export destinations are Uganda, Tanzania, Rwanda and Somalia, accounting for 74% of exports. Kenya imports on average roughly four times as much as it exports, and nearly all of the local production and exports are generics, which is the reflection of the very low rates of expenditure on research and development in Kenya. Both exports and imports have grown at a compound annual growth rate (CAGR) of 7% per year since 2008.

[16] Pharmaceutical Sector Profile: Kenya. UNIDO, 2010.
[17] UNIDO, 2010 and interviews with pharmaceutical industry executives.

Figure 2: Kenya Trade in Pharmaceuticals



Source: Global Trade Atlas

YOUTH ENTRY POINTS

There are several tens of thousands of jobs in the distribution and retail side of the system (we have no firm estimate) and the number of opportunities is much larger. These vary from sales and warehousing functions, requiring relatively little education, to more advanced technician and pharmacology jobs in the laboratory testing phase.

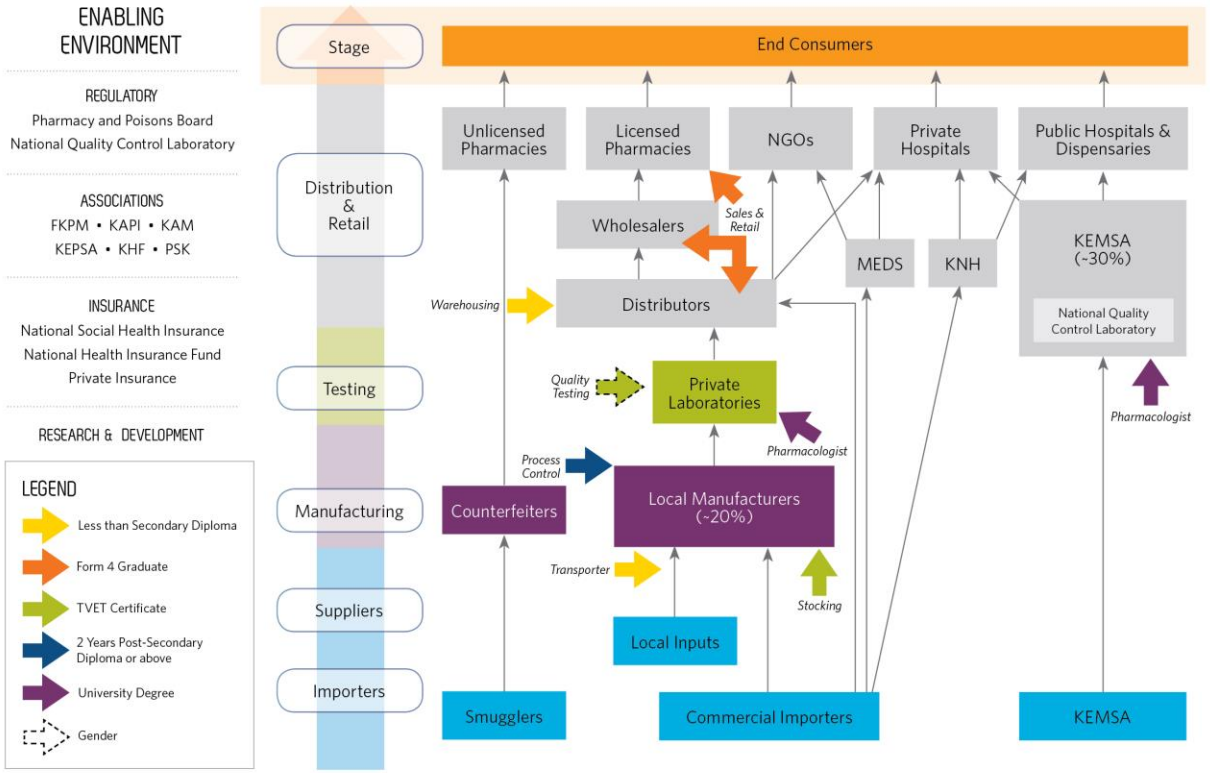
There are a number of occupations where youth could potentially find jobs in this sector. Since a relatively small proportion of medicines consumed in Kenya are produced locally, the number of local jobs in the manufacturing side is correspondingly low – estimated at around 3,400 total.[18] If efforts to expand local production are successful, a variety of well-paying jobs with excellent career prospects could be created, but under current conditions the most likely opportunities are in areas such as transportation of inputs, stocking, and – very limited – in technical areas such as process control.

In Figure 3, entry points for youth job opportunities are identified according to arrow patterns and color, indicating the education or training requirements needed for the position. In addition, a gender lens is included; arrows outlined in dotted lines indicate professions that industry experts consider to be particularly suitable for women as well as men (i.e. based on observed

[18] UNIDO, 2010 and interviews with pharmaceutical industry executives.

practice rather than traditional stereotypes). Here, arrows in four formal channels identify job opportunities at different levels of the value chain (supply, manufacturing, standards/testing, distribution and retail) based on required levels of education and qualifications.

Figure 3: Kenya's Pharmaceutical Value Chain

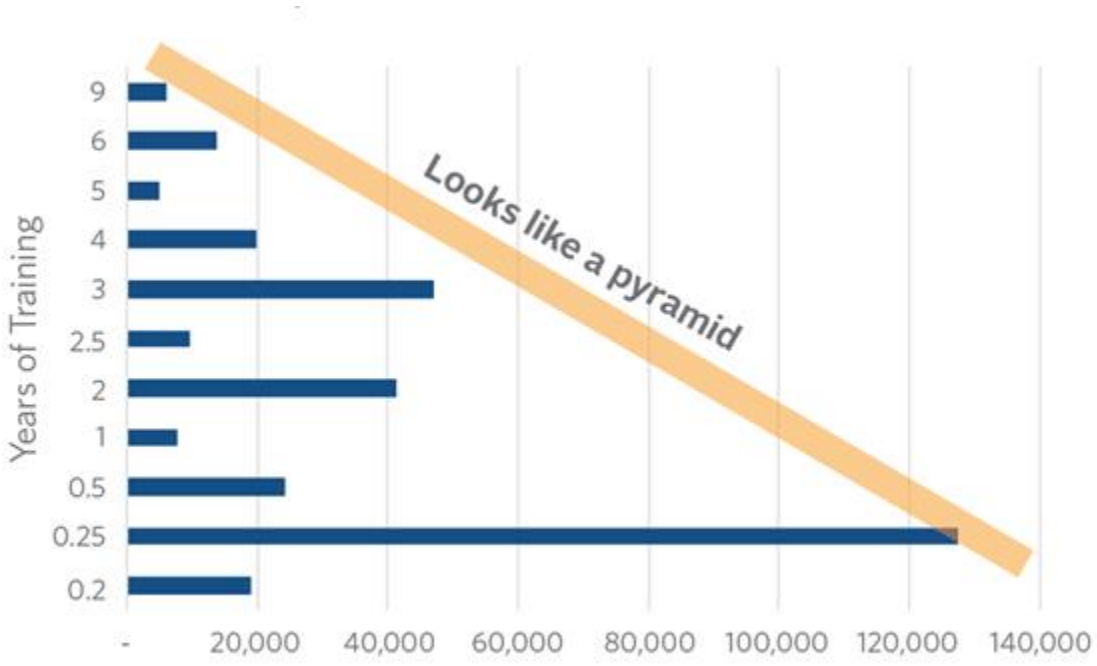


▶ OCCUPATIONAL STRUCTURE: NORMS VS. ACTUAL

Most organizations rely on a pyramid structure to balance to offset the high cost of the most highly trained personnel, and healthcare is no exception. While doctors are the most highly trained category of personnel, they are also the most costly, so the best way to maximize the efficiency of each doctor's time is to organize hospitals and other healthcare facilities so that they contain a variety of occupations of various skill levels. Although the occupational structure of each facility will depend on the actual capacities of the clinical staff and the needs of the patient population served, at the aggregate national level, one might would expect a country with a shortage of training capacity and an excess supply of less-educated workforce to have a health workforce that exhibits a pyramid structure.

Using the Ministry of Health's Health Norms and Standards Guidelines[19], Kenya's forecasted occupational composition does look somewhat like a pyramid (see Figure 4). Specialists (attending physicians) with the most training (nine years) are the smallest number at the top, medical officers (general practitioners) are available in greater numbers, with six years of training, a slightly greater number of clinical officers with 4 years of training, registered nurses and other occupations with three years of training are available in even greater numbers, and the least expensive and least trained personnel (community health workers, for whom we have used a benchmark of 13 weeks of training[20]) are the most prevalent.

Figure 4: Norms for Number of Staff by Training Level (with 120,000 Community Health Workers)

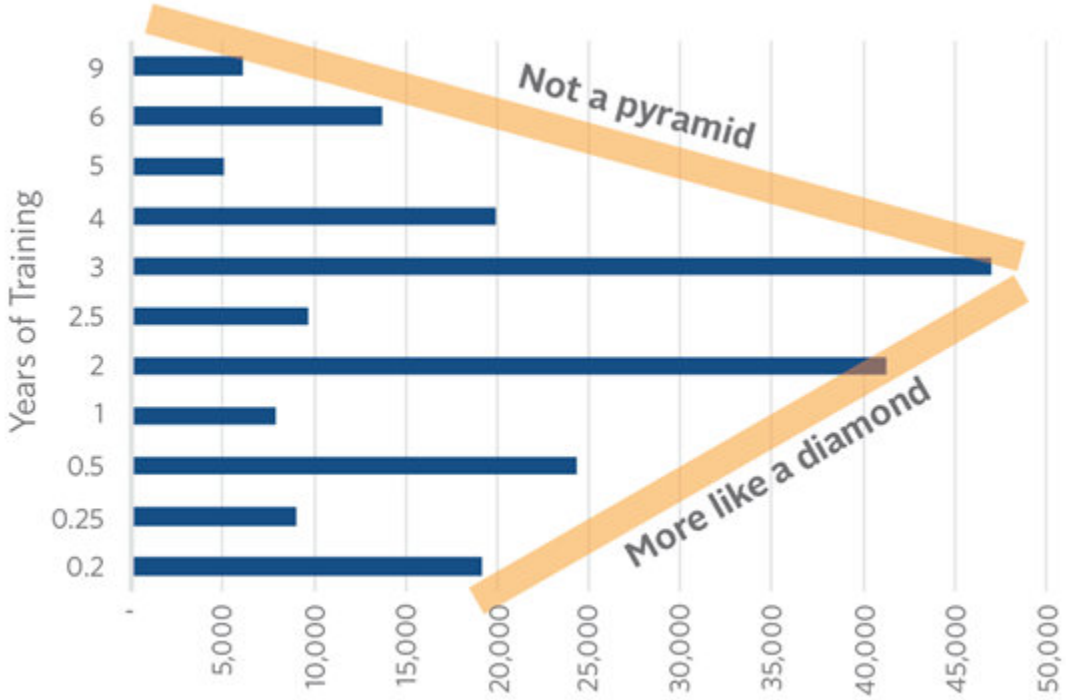


However, the impression that the occupational structure is pyramidal in shape is largely driven by one number – the projected 120,000 community health workers. While the projections for most of the other occupations are extrapolations of existing trends, the figure for the community health workers is based on a norm that is far from being realized, as fewer than 2,500 community health workers are currently deployed. In discussions with several senior ministry officials, and informed outsiders, it emerged that despite consensus about the role of community health workers and their high benefit/cost ratio, and statements that implementing community health services is a top priority, in practice the budgetary resources for compensating them have not been identified.

[19] Towards Universal Health Coverage: The Kenya Health Strategic and Investment Plan, 2014 – 2018 / Human Resources for Health Norms and Standards Guidelines for the Health Sector, Ministry of Health, August, 2014.
[20] Training of community health workers (CHWs) ranges in duration from a few days to a few months, depending on the provider.

Figure 5 illustrates the occupational structure when the CHWs are removed from the projections. The shape of this figure is much more like a diamond, with a bulge (largest number of workers employed) in the middle, rather than at the bottom.

Figure 5: Norms for Number of Staff by Training Level (with Actual Community Health Workers)



This diamond shape also matches the shape observed in practice at one of two hospitals where the team was able to collect actual employment data – Nakuru County Referral Hospital (Figure 6). In both the Ministry's published norms guidance, and in its actual practice, the tendency has been to allocate more budget for the middle categories requiring three years of training, exemplified by registered (diploma-level) nurses, and significantly fewer jobs for less costly occupational categories such as enrolled (certificate-level) nurses (two years of training), and nursing assistants and patient attendants (one year of training). Nairobi Hospital, a private facility, exhibits a similar structure (Figure 7).

Figure 6: Occupational Composition of the Nakuru County Referral Hospital

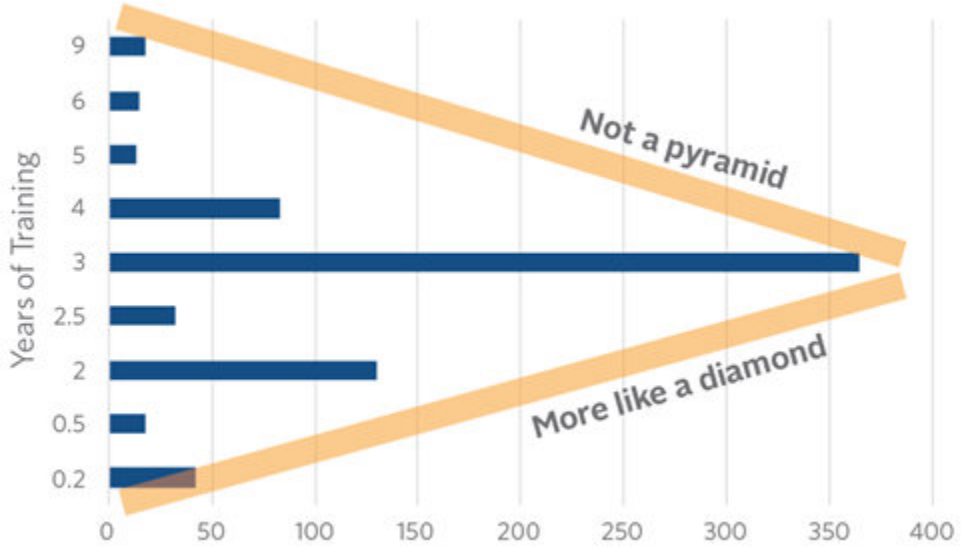
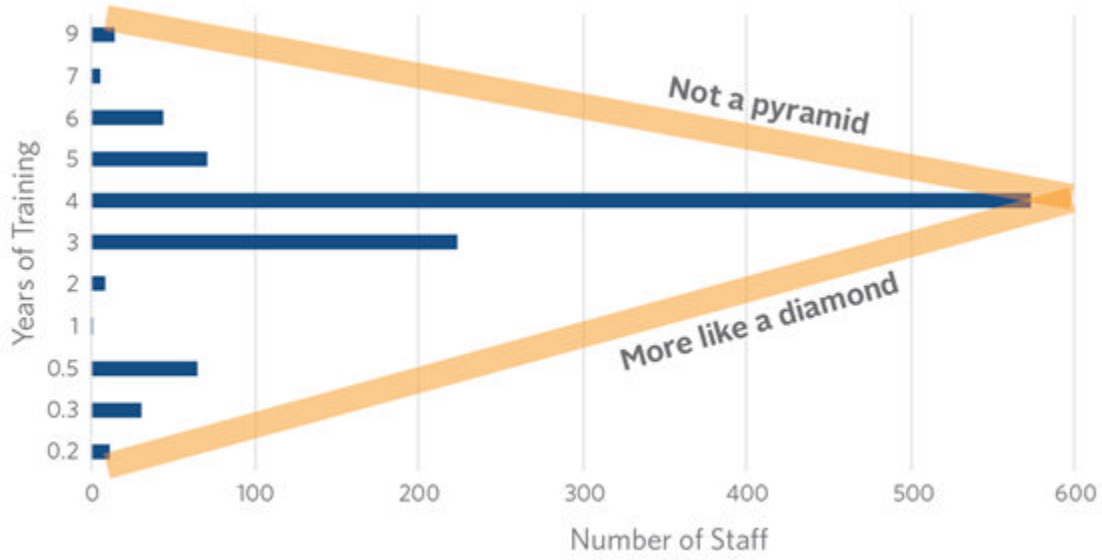


Figure 7: Occupational Composition of Nairobi Hospital



Depending on the facility, the capacity of existing staff, and the needs of the population being served, a registered-nurse heavy staffing mix and/or a diamond-shaped occupational structure may indeed be optimal -- or it may be inefficient. In either case, what we see in Kenya is a reflection of a shift towards the professionalization of nursing, the growing political power of nurses, and some unfortunate supervisory failures.

Globally, there is a trend towards professionalization of nursing, including higher levels of training and education. In Kenya, certificate nursing programs are being phased out in training institutions, and nurses' unions are lobbying for more hiring of registered nurses, rather than enrolled nurses, to fill vacancies, as salaries are higher.

In addition, nursing assistants (a.k.a. nurse's aides) and patient attendants have been phased out in public facilities based on incidents in which patients have been injured (and in some cases died) due to improper care from these categories of lesser-trained staff. Many private facilities, however, reportedly continue to employ such aides. Observers of Kenya's healthcare system point out that with proper supervision from nurses, such incidents are likely to occur very rarely, while the additional care that can be given to patients by less costly staff (such as changing bed pans, sponge baths and assisting patients to the bathroom) can free up valuable time for more highly trained staff to perform more complex operations. At present, in many cases, nurses may not actually be providing this care; rather, the families of patients are expected to do so, which in many cases means it is provided in a less-than-hygienic and non-routine or irregular manner, and can lead to suboptimal health outcomes.

It is therefore tempting to conclude that the diamond-shaped occupational structures for the national healthcare staffing mix do not reflect a cost-efficient response to Kenya's urgent healthcare needs, but an interest-driven outcome that provides greater job security for a narrow segment of workers, at the expense of patient care and expanded overall employment. Tasks such as bathing patients that could be carried out by less-educated individuals fall instead under the scope of practice of nurses, but in reality may (or may not) be handled by family members. At the same time, the approximately 5% of nurses-in-training who drop out each year (see Annex III) leave school without any nursing credentials. If these individuals instead received some sort of certification of courses successfully completed that could qualify them for a position as a nursing assistant, they might find employment in the system and their knowledge and the investment in their education would not be wasted.

The stalled program to radically expand the number of community health workers is another example of the missed opportunity to put a larger share of the workforce to work addressing vital healthcare requirements. Ultimately, an exploration of options to allow individuals with lower levels of training to provide these forms of care would boost employment opportunities for young people, many of them women; would provide existing nurses with opportunities to develop key supervisory skills; and would help meet the needs of patients and community members, potentially improving health outcomes. With a greater willingness to re-examine healthcare budgets and stand up to powerful professional unions, far more care could be delivered and tens of thousands more could be employed within the existing budgetary constraints.

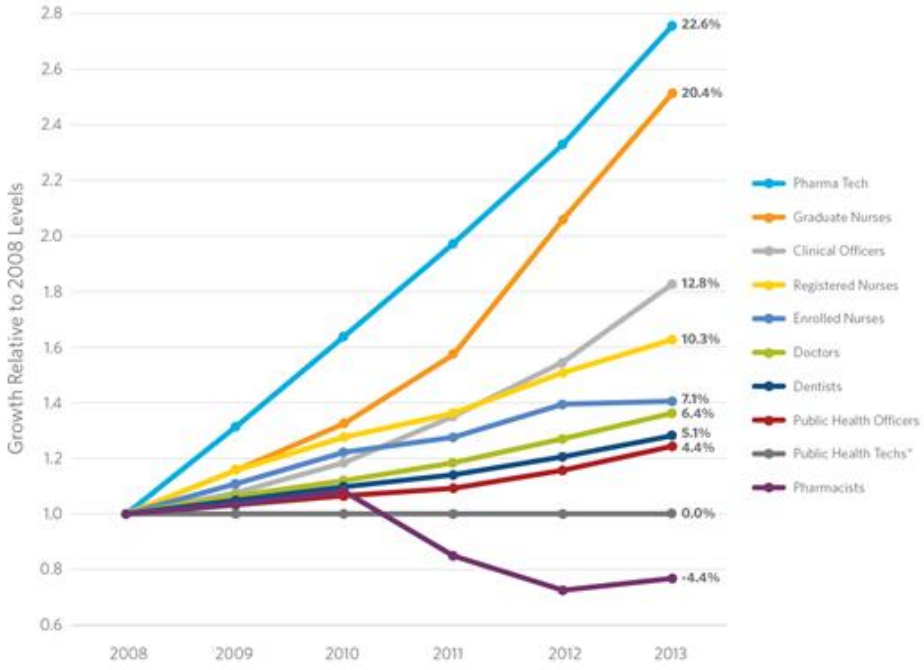
▶ STOCKS AND FLOWS OF HUMAN RESOURCES FOR HEALTH

A healthy population plays a critical role in boosting economic growth, poverty reduction and realization of social, economic and political goals. Key areas of focus for Kenya's health sector, as laid out in the Kenya Vision 2030 document, are access, quality, capacity and institutional development.[21] Achieving these healthcare goals depends greatly on having the necessary

[21] Republic of Kenya (2007). *Kenya Vision 2030: A Globally Competitive and Prosperous Kenya,* Nairobi: Ministry of Planning and National Development and the National Economic and Social Council.

human resources for health to deliver the healthcare services. Kenya has made significant progress in recent years in terms of increasing the supply of human resources for health. This has seen the registered number of health workers grow by an average of 8.3 percent per year since 2008. Figure 8 shows the growth in the number of registered medical personnel in Kenya over the period 2008 to 2013 (see data in Annex II). The chart shows a phenomenal growth in the cadres of pharmaceutical technologists and graduate nurses with annual growth rates of 22.6 and 20.4 percent respectively over the five-year period. A striking feature is the decline in the number of registered pharmacists since 2011.

Figure 8: Index of Growth of Registered Medical Personnel in Kenya

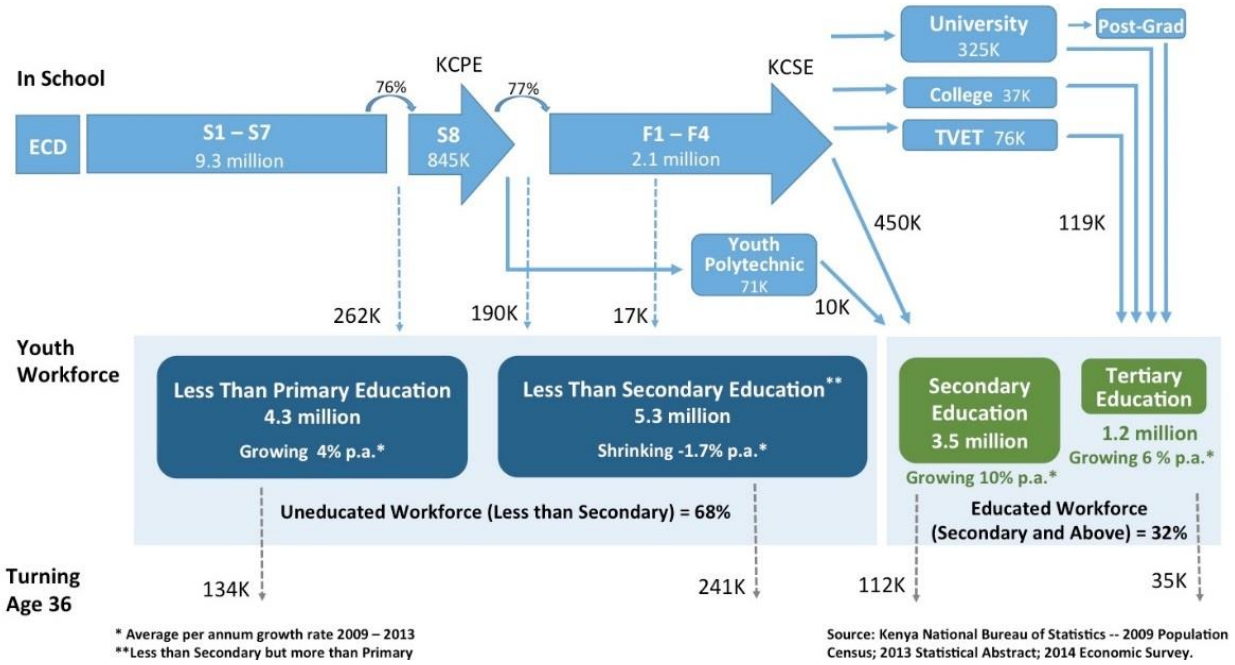


Source: Kenya National Bureau of Statistics, 2014; * Training phased out

These aggregate numbers, however, obscure the dynamics within each profession. We can deepen our understanding of these dynamics using "stock and flows" diagrams, a concept which will be introduced below using the example of Kenya's youth workforce (Figure 9); a review of educational attainment data yields a revealing picture of skills supply in the country's youth workforce, as represented by formal education levels.[22]

[22] The following section is drawn from FHI 360's 2015 Kenya Youth Assessment for USAID. Calculations are estimates. Some needed data are not available and assumptions or simple models were used for estimation. However, results have been reviewed with leading professionals in the field and are understood to represent a reasonably accurate picture of the dynamics of youth labor market supply in Kenya.

Figure 9: Youth Educational Attainment Stocks and Flows



The top level of the diagram shows stocks and flows of students throughout the formal education system, based on gross enrollment rates for 2013.

There are currently 9.3 million children in levels 1-7 of Standard 8 (primary school). Currently, only 76% of students proceed from Standard 7 to Standard 8, with 262,000 students per year dropping out of the system at this critical time prior to the Kenya Comprehensive Primary Examination (KCPE). One level higher, there is another wave of 190,000 dropouts[23] annually following the KCPE. The vast majority of secondary students (2.1 million) enroll in Form 4, while 71,000 enroll in Youth Polytechnics which provide technical and vocational education. A much smaller wave of dropouts (17,000) exits the secondary system annually. The majority of Form 4 graduates, about 450,000/year, enter the workforce with no further education. Among the minority who proceed to tertiary education, the vast majority enroll in universities with a small number entering TVET institutions and Teacher Training Colleges. The tertiary education system produces around 120,000 graduates per year.

The bottom level depicts youth workforce "stocks," grouped by educational attainment. These stocks were based on 2009 population census, and updated for each subsequent year based on a "stock-and-flow"' methodology developed by the team. The numbers next to the bottom four dashed arrows represent the outflow from these "stocks" of workforce – our best estimate of the number in each category who turn 36 and are no longer counted as "youth."

[23] The term "dropout" is not intended to connote a failure of motivation on the part of youth.

The "Uneducated Workforce" in navy blue, for lack of a better term, represents youth with less than secondary education which constitute about 2/3 of the youth workforce (all youth 15-35). This group can be subdivided into those with less than primary education (4.3 million) and those who have completed primary, but not secondary (5.3 million). The annual waves of primary and secondary school dropouts referenced above flow into these stocks. As the graphic shows, the stock of youth with less than primary education is growing 4% a year, while those with less than secondary is shrinking slightly, as the flows of dropouts are counteracted by the 241,000 youth "graduating" from this stock by turning 36.

The "Educated Workforce" in green is dominated by the stock of 3.5 million secondary graduates, as compared to 1.2 million tertiary graduates. Both stocks are expanding relatively quickly.

We can use the same method to understand dynamics within health worker cadres. The following diagrams illustrate the stocks and flows data for selected categories of human resources for health as of 2013. Under this approach, trained health workers in the health system represent the "stock" while movement in and out of the workforce represents "flow." The main sources of outflow from the stock include retirement, death and emigration. Leakages from the system are mainly characterized by dropouts.

The intakes into the various medical training programs constitute an inflow into the health system. The number of healthcare professionals in active service constitutes a stock. These workers were variously engaged in public and private health facilities.

There are "stocks" in two places – one, students and professionals currently in training (blue) or practice (green), and two, individuals who have left each level (yellow). "Flows" are the rate at which they pass (inflow and outflow) through the various stages of the education system and the labor pool; unfortunately, flow data is very difficult to obtain, as it is not being collected, except for dropout rates. In the figure, one can review the current population (stock) and flow (transition) of individuals from training all the way through the various professional tracks.

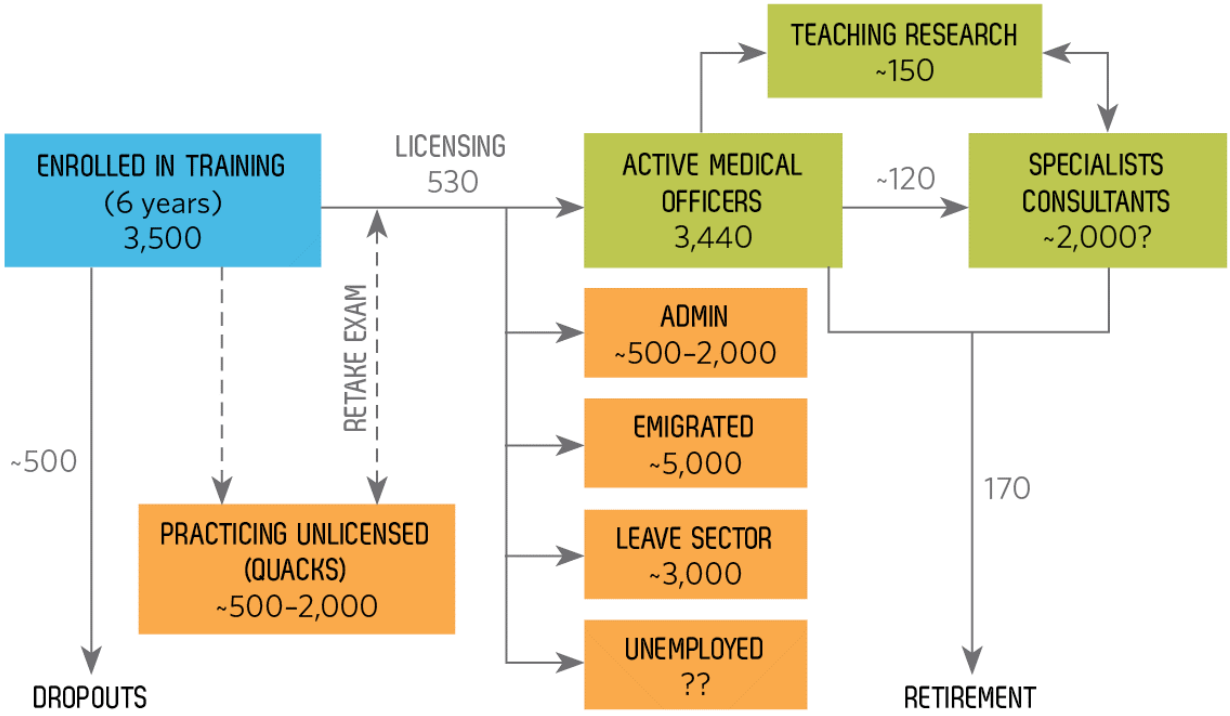
The medical fields suffer varying levels of leakages in the form of dropouts. Leakages from the system reduce the rate at which the stocks of qualified medical practitioners build over time. The leakages also feed into the stock of informal (unlicensed) healthcare providers or quacks.

Accurate data on the rate of emigration among the Kenyan healthcare professionals is scarce. However, a 2008 estimate indicated that 51 per cent of doctors emigrate compared to 8.3 per cent of nurses.[24] This means that the country has to train at least two doctors so as to retain one. Also, while some healthcare professionals flow out to join teaching and/or research, others upgrade to special consultants and/or venture into administration, business, teaching, or Information and Communications Technology (ICT).

[24] D.M. Ndetei, L. Khasakhala & J.O. Omolo, "Incentives for health worker retention in Kenya: An assessment of current practice," *EQUINET Discussion Paper Series 62,* EQUINET with African Mental Health Foundation, University of Namibia, Training and Research Support Centre, University of Limpopo and ECSA-Regional Health Community, EQUINET, Harare, 2008.

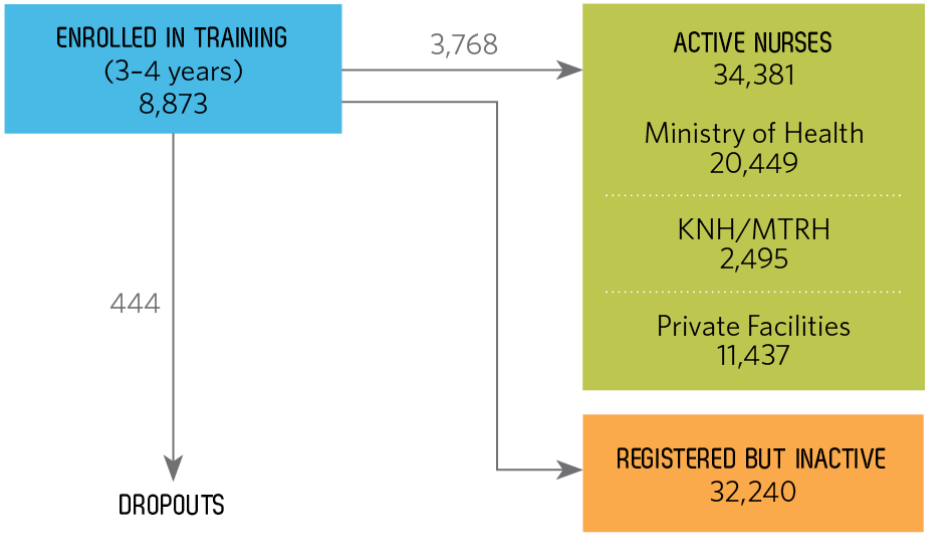
It takes between 2-6 years to train a medical professional in Kenya, and the cost of training ranges between US $836 and $11,381; doctors are the most expensive to train.[25] Compare this to US public expenditure on graduate medical education – that is, the training that medical school graduates receive as residents in teaching hospitals – of $100,000 per year per resident.[26] The cost of training a dentist, US $6,607, represents 58.1 per cent of the cost of training a doctor[27] while the cost of training a clinical officer (US$5,899) is six times that of a diploma nurse (US$975; see Annex III for data).

Figure 10: Stocks and Flows – Doctors, 2013



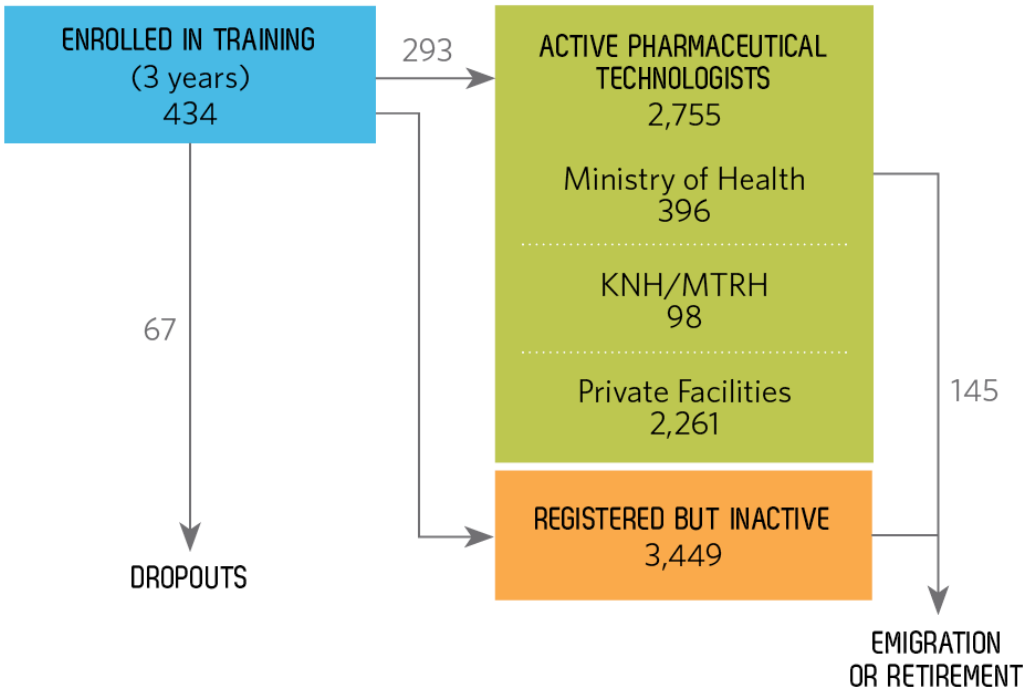
[25] Based on exchange rate of Ksh. 86.12/US$ in 2013.
[26] C. Dower, "Health Policy Brief: Graduate Medical Education," Health Affairs, August 16, 2012. http://healthaffairs.org/healthpolicybriefs/brief_pdfs/healthpolicybrief_73.pdf
[27] Ksh. 569,000

Figure 11: Stocks and Flows – Nurses, 2013



KNH: Kenyatta National Hospital; MTRH: Moi Teaching and Referral Hospital.

Figure 12: Stocks and Flows – Pharmaceutical Technologists, 2013



KNH: Kenyatta National Hospital; MTRH: Moi Teaching and Referral Hospital.

What is wrong with these pictures? As we see from Figures 10, 11 and 12, there are almost as many --or more-- doctors, nurses and pharmaceutical technologists who are registered but inactive as practicing.

Figure 10 shows that around 3,500 students were enrolled to train as doctors in 2013, while in the same year, an estimated 530 doctors became licensed in the country. This number represents a flow into the system. Though there are some doctors who train and graduate from higher education institutions outside the country and, therefore, flow into the stock of skills in the country, such numbers are not known with precision. The figure shows that there were approximately 3,440 doctors in active service in 2013.

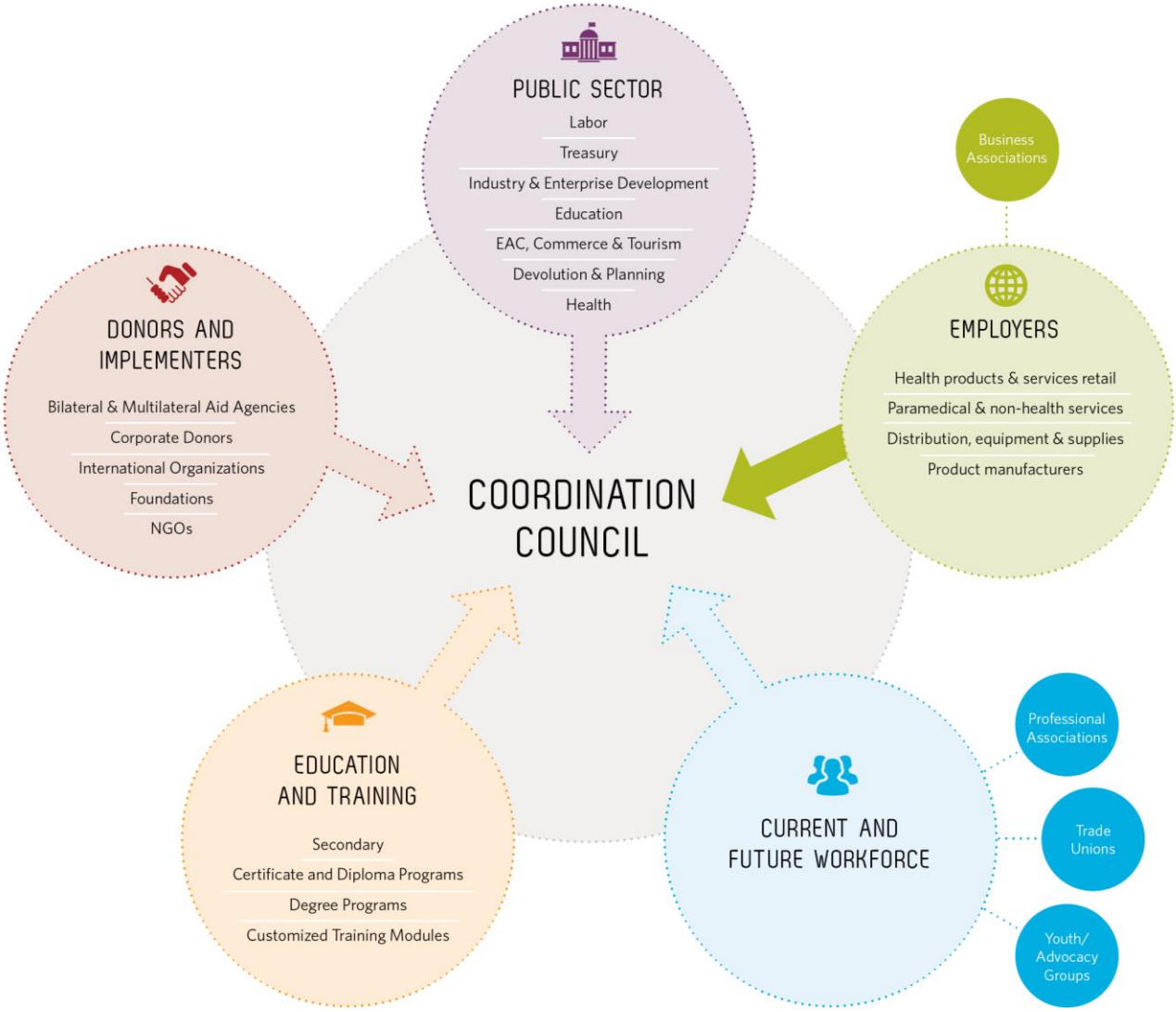
The number of those taking nursing courses was 8,873 (see Figure 11). The highest flow into the total stock of healthcare personnel in 2013 was from nurses at 3,768. There were also 34,381 nurses in active service in 2013. This means the ratio of doctors to nurses in active service in 2013 is 1:10.

Figure 12 shows us that the highest dropout rate of all cadres was that of pharmaceutical technologists, estimated at 15.4 per cent. This means that of the 434 students who had enrolled to pursue a course in pharmaceutical technology in 2013, about 67 dropped out.

▶ SYSTEM ACTOR COORDINATION

Though the mobility depicted in the above diagrams should not be seen as a negative phenomenon – workers stand to gain the most when they are free to move to where their skills are the most valued – the high levels of emigration call for an analysis of the return on investment to training health professionals of each of the various cadres. Furthermore, our fieldwork suggests that health education and training institutions are failing to communicate with health employers as to the type and number of health workers in demand. In theory, the professional associations are meant to serve this function, and a coordinating body exists within the MoH to support the process. In practice, this is not occurring, and the coordinating body does not function; instead, institutions such as the Kenya Medical Training College are expanding their throughput of health workers without regard for the capacity of the health system to absorb the graduates. Does this reflect a coordinated effort to "flood" the health labor market and export Kenya's health workers to the world, *a la* the Philippines and a strategy espoused by the MoH's Director of Medical Services? Or does it signal a lack of coordination, where health education and training institutions capture government resources by filling seats? Our research would seem to point to the latter.

Figure 13: Idealized Kenya Health Labor Market System Map



What should the system look like, and how could it function to better allocate resources? In the above stylized map of Kenya's health labor market, which depicts a more ideal state of affairs, health sector employers (private, public, nonprofit, and faith-based) lead a coordination council on which sit representatives of the other main stakeholder groups. The public sector is responsible for planning and allocating financing to public health education and training programs. The education and training institutions and programs, both public and private, develop curricula, set admissions requirements, and allocate funding, faculty, equipment and other resources amongst specific programs and courses. Members of the current and future health workforce (as represented by professional associations, trade unions, and youth/advocacy groups) can use the information to inform their own educational, career, and professional development choices and pathways. Donors and implementers bring additional funding,

material, knowledge and human resources to the system. The coordination council's role is to assess and communicate health-related skills and training needs and current and anticipated employment opportunities to the stakeholder groups. The council also serves to transmit information from the other stakeholder groups back to employers.

Such a coordination body could serve to partially delink the health education and training system from the centralized public sector planning mechanism. Funding for health workers has already been devolved to the county level, but county and local health facilities still face serious challenges in making their human resources needs heard and fulfilled. As they would be represented on the coordination council (or on a county sub-council), a much tighter link could be established between local education and training institutions, local employers' skills needs, and the local workforce.

▶ HEALTH SERVICES MODELS

In an effort to address some of the challenges facing the production, retention, and distribution of high-quality human resources in health in Kenya, it may be useful to sort the country's health care delivery system into models serving different market segments, allowing us to more effectively explore potential interventions in the private, public, and education/training sectors which may improve the alignment of skills supply and demand Kenya's health-related industries.

A typical demand-side workforce analysis of an economic sector would focus on market needs and work backwards from there, designing training and skills programs around market segments. However, this is not typical in the health sector, particularly in countries with less-developed private health systems, where investments in the healthcare workforce are presumed to be, in general, for the benefit of the public. In this context, and since such a market-driven approach might provoke a negative reaction from healthcare workforce policymakers, there is a strong argument to be made for a core level of skills development across all market segments.

However, since the private commercial health care segment is larger than the public segment[28], and growing as Kenyans are increasingly seeking health services and goods on the private market, requiring concomitant skills development across the entire health economy, a market-focused view should be taken into account when looking at workforce needs and designing training programs. These models, therefore, help to inform the study's programming recommendations, presented with our conclusions. The reader should note that these models are essentially caricatures, and not intended to be exhaustive.

[28] J. Barnes et al., Private Health Sector Assessment in Kenya, 2010

Figure 14: Four Models of Health Care Delivery Serving Key Market Segments

- In the **High-End Private** model, the value proposition is *Quality*. Patients expect the most up-to-date treatments; that doctors and specialists have the depth of experience to select and carry out treatment; that nurses and other staff possess a patient-centered attitude; and that their care will be integrated across the facility. This value comes at a high cost, but a patient goes to this provider because he or she has faith in the system.
- The **Affordable Public** model's differentiating factor, *Breadth of Offering*, lies its ability to make a range of treatments, from basic to specialized services, available at a low cost -- though patients may experience long waits and may not receive the most cutting-edge treatments, while providers may not have access to the latest technology, equipment, or supplies. A patient often visits a public facility because s/he has no other choice.
- In the **Low-End Private** model, the *Access* value proposition is supported by three components – though providers offer a more limited range of services to patients they are physically proximate, low-cost (relative to high-end providers), and generally offer shorter waiting times than public facilities. A patient will generally go to a low-end private provider because it is convenient.

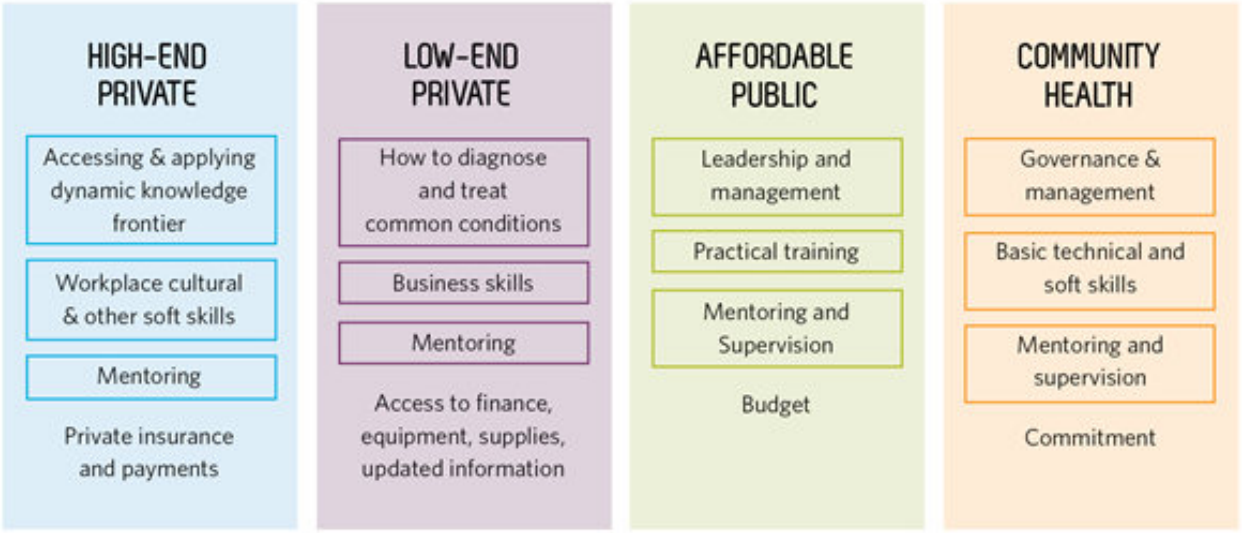
- In the **Community Health** model, the value proposition lies in the *Peer-to-Peer Interaction*: community members' ability to affect behavioral change (around sanitation, hygiene, nutrition, family planning etc.) resulting in better health outcomes at a relatively low cost. Not only do patients trust the community health workers - their neighbors and peers – but these providers come to them.

The inputs needed for each of these value propositions vary by model. We focus here on the skills inputs (boxed), though these, clearly, must be complemented by other critical inputs (also listed) for each model to fulfill its value proposition.

Though there is some overlap – for example, the need for mentoring and/or supervision runs across all the models -- each model might seem, on its face, to map to a particular type of training provider. That is, high-end private medical facilities train their own workers to a great extent; private, faith-based, and NGO training institutions provide training for low-end private and community health workers; and public training institutions and the Ministry of Health train and upgrade the skills of health workers in public facilities. Not every health worker will need the same training – the specifics will depend on where that person ends up working.

However, as we recall from the health economy diagram, reality is complex. A nurse trained in a faith-based nursing school may end up in a large public hospital; an NGO may provide customized management training to a manager of a mid-sized public health facility; and a community health worker may receive training from the Ministry of Health as well as from a local NGO funded by an international donor. It is worth continued research into which segments are served by which education and training providers to make adjustments that may serve to enhance the functioning of each segment's market value proposition, and also improve the retention and performance issues that each segment faces.

Figure 15: What are the Critical Inputs Supporting Each Value Proposition?



Though these workers will presumably have gained their foundational skills in the general educational system and are accepted into health training institutions based on their test results (admittedly an imperfect proxy), the "soft" skills required for effective performance in their future positions are not a focus of admissions criteria to education programs (despite anecdotal data that health professionals with a service orientation are more likely to be willing to serve in hardship areas and stay in the health sector) nor of curricula, which instead focus on technical competencies. Indeed, it is precisely these soft skills which health workers can build on to acquire specific on-the-job skills, allowing them to reach a higher level of performance in any setting. In addition, soft skills can help health workers better supervise and mentor others, creating a better working environment and a positive feedback loop.

The pyramid below shows where skills required[29] in two specific health sector occupations (one care-related, the other not) are typically developed, and, implicitly, who pays for them. Foundational skills, developed in general education and in non-formal settings, provide the base for work readiness skills, which are acquired in specialized education and training programs. These in turn allow for the acquisition of the skills learned on the job -- that is, how to use the technology and tools specific to an occupation and often to a particular firm or organization. Here we focus on two sample occupations, nursing assistant and medical secretary. These roles, though they require lower levels of education and training than for example nursing, are nonetheless important to the functioning of health facilities and the overall health economy. Regardless, they are often overlooked because they do not have the visibility of other health sector occupations such as the medical and nursing professions.

[29] Skills data from the US Department of Labor's O*Net Online, https://www.onetonline.org/

Figure 16: Required Skills – Where Are They Learned?

Source: Authors' elaboration, skill types from O*Net Online, https://www.onetonline.org/

▶ CONCLUSIONS AND RECOMMENDATIONS

Although Kenya has made impressive efforts to strengthen its healthcare workforce over the last decade, the country continues to face serious unmet healthcare human resources needs. However, international benchmarks obscure more nuanced information about the supply of qualified health care workers in Kenya. Our analysis indicates that government and donors do a disservice to the system by characterizing Kenya's health worker challenge as a mere "shortage," when in reality, the health education and training system is actually graduating large and growing numbers of health workers – but their output is not coordinated with the demands of the health economy. The numerical shortfall of trained workers is magnified by failures in the recruitment and retention system, which result in maldistribution and huge inefficiencies in investment into training new workers -- meaning that, for some cadres, two to three workers must be trained in order to keep one.

Demand-side analysis of the health sector is not typical, but it provides a critical perspective and a powerful tool for addressing these issues. Our examination of the pharmaceutical value chain and the occupational structure of Kenya's public healthcare workforce reveals a number of opportunities to put a larger share of the workforce – particularly women and those with lower levels of education -- to work addressing vital healthcare requirements. Since the private commercial health care segment is larger than the public segment and growing, a market-focused view should be taken into account when looking at workforce needs and designing training programs. The health services models presented in this assessment can help to inform pre-service and on-the-job training as well as other programming providing services and supports to workers and health sector businesses.

Finally, our fieldwork suggests that health education and training institutions are generally failing to communicate with health employers as to the type and number of health workers in demand, while health education and training institutions capture government and donor resources by filling seats rather than responding to market needs. In one ideal scenario, health sector employers would lead a coordination council comprised of representatives of the main stakeholder groups. The council would assess and communicate health-related skills and training needs and current and anticipated employment opportunities to the stakeholders, and transmit information back to employers.

Our analysis leads us to several key conclusions. Most importantly, the health education and training system is largely unconnected to the needs of patients and employers and the actual absorptive capacity of the public health system. Training of many health personnel to get a few into practice does not appear to be based on any analysis of the return on investment, and it appears that the hiring part of the labor market in healthcare is "more broken" than the training part. In other words, not enough of the many doctors and nurses being trained are being hired. This is partially due to lack of budget, which in turn suggests that items like the following deserve more attention: a) efficiencies and better management (to make the most of existing budgets, e.g. using more workers from lower in the pyramid), b) improved health insurance schemes (to expand the available budget) and c) improved policies to allow the private sector to play a bigger role, but with better oversight.

Better communication between actors can help:

- Improve the return on investment in health education and training -- reducing attrition from education and training programs, and from employment in the sector; as well as improve placement and retention of health workers in high-need posts, both geographically and by cadre and specialization
- Support the ability of facilities and firms to increase their capacity
- Increase access to and affordability of preventive care and health services by licensed providers, and medicines; and decrease wait times for patients
- Increase youth awareness of employment opportunities in the health sector; and

- Enhance the domestic and international image of Kenyan health-related subsectors (healthcare, pharmaceuticals).

This would require:

- A coordination mechanism between system actors that would facilitate, for example, medical school admissions being linked to employer demand in terms of numbers, occupations and skills rather than to bed space and GPA
- Recognition that in a labor market, skills are partially transmitted by the mobility of people; and encouragement of the mobility of people through different parts of the health economy: between the private and public sectors, rural and urban areas, and community, niche, and high-end facilities
- An explicit recognition of the segments of the health market, their corresponding value propositions, and the implications for education and training and other inputs. In each of the models explored, traditional medical or clinical training must be supplemented by other types of skills training (e.g. communication, customer service, leadership, management) and additional inputs in order to support the value proposition.
    - Technical skills training and experiential learning don't produce better health results in a vacuum, and better coordination of the multitude of health training providers on developing students' soft skills can complement the technical preparation of health workers and prime them for higher performance and satisfaction across the spectrum health care services models. By increasing their focus on soft skills and supporting the value proposition of the main market segments outlined above, education and training providers could help maximize the return on investment in training by improving performance and retention rates.
    - Internships and residencies are the norm in health care, which puts it head and shoulders above other sectors. However, not all health-care and health-related occupations benefit from such work-study arrangements, and expanding these practices to other occupations would benefit a larger share of the health workforce.
- A focus on professions beyond doctors and nurses and, importantly, on career pathways. There are many overlooked entry points for young and less-educated people into health-related sectors such as pharmaceuticals, and in positions such as nurses' aides, roles which can improve health-system functioning by allowing workers with higher skill levels to focus on more complex tasks. Employers have a role to play in communicating information to young people about alternative careers in the health sector, and examining and sharing which skills (not just educational levels) are required. More research is also needed into how might young people currently working or trained in the hospitality and tourism sectors be able to transfer their skills to medical tourism or from other sectors to additional health-related sectors with potential growth

- Analyzing and addressing key policy issues; for example, might Kenya improve its position in pharmaceutical manufacturing and trade if it were to adopt quality standards similar to India's?
- Supporting the devolution process via a shift towards localized, rather than centralized, training and hiring of health workers and improving the management capacity of local health facility managers and officials

Our conclusions suggest a number of recommendations, organized here by stakeholder group.

▶ EMPLOYERS:

- Form and lead a Coordination Council that gathers and assesses information on sector skills and training needs and transmits it to the other stakeholder groups
- Provide opportunities for work-study in non-traditional occupations (i.e. not only doctors, nurses, etc.) and in underserved areas, high-needs specializations, and smaller facilities
- Develop and/or participate in health career information, orientation, and shadowing programs for students and graduates
- Facilitate residency and internship opportunities for health professionals anticipated to be required by an expansion of medical tourism services including specialists in key clinical areas such as cardiovascular, oncology and renal medicine
- Coordinate with local health education/training facilities on occupational and skills needs
- Provide management training for administrators and managers

▶ EDUCATION AND TRAINING PROVIDERS:

- Via a Coordination Council, align admissions requirements and training curricula with employer needs
- Allow for certification of students at risk of dropping out (e.g. as nursing assistants or community health workers) prior to completing education and licensing to mitigate skills waste
- Offer career services (including for returning dropouts)

▶ MINISTRY OF HEALTH

- Via a Coordination Council, coordinate financing of health education and training with employer needs
- Facilitate on-site management training to mid-level health officials and facility managers
- Facilitate incentives for health professionals to undertake internships/residencies in underserved areas, high-needs specializations, and smaller facilities

- MINISTRY OF EDUCATION
  - Per the draft Health Tourism Strategy, conduct a human resources needs gap assessment in value chains related to medical tourism
- MINISTRY OF INDUSTRIALIZATION AND ENTERPRISE DEVELOPMENT
  - Per the draft Health Tourism Strategy, promote local manufacture of pharmaceuticals
- DONORS
  - Support management training for health officials/managers (see above)
  - Support incentives for health professionals to undertake internships/residencies in underserved areas, high-needs specializations, and smaller facilities (see above)
  - Support programs to work with unlicensed providers to become licensed, and gain critical medical information and business management skills, as well as access to supplies, equipment, and laboratory testing services
- NON-GOVERNMENTAL ORGANIZATIONS
  - Recognize and tailor training programs to key market segments and coordinate them with interventions in access to finance, equipment, and supplies, and capacity building

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ANNEX II: NUMBER OF REGISTERED MEDICAL PERSONNEL IN KENYA

Category / Year	2008	2009	2010	2011	2012	2013	Annual Average Growth Rate (%)
Doctors	6,369	6,800	7,129	7,549	8,092	8,682	6.4
Dentists	817	859	898	930	985	1,045	5.1
Pharmacists	2,860	2,955	3,097	2,432	2,076	2,202	-4.4
Pharmaceutical Technologists	2,250	2,955	3,679	4,436	5,236	6,204	22.6
BSc Nursing (Graduate Nurses)	745	863	988	1,173	1,532	1,873	20.4
Registered Nurses	23,310	26,988	29,678	31,719	35,148	37,907	10.3
Enrolled Nurses	19,107	21,146	23,346	24,375	26,621	26,841	7.1
Clinical Officers	7,245	7,816	8,598	9,793	11,185	13,216	12.8
Public Health Officers	6,960	7,192	7,429	7,584	8,069	8,637	4.4
Public Health Technicians*	5,969	5,969	5,969	5,969	5,969	5,969	0.0
Total/Average	75,632	83,543	83,543	90,811	95,960	104,913	8.3

ANNEX III: STOCKS AND FLOWS FOR SELECTED MEDICAL PERSONNEL IN KENYA

Category	Years of Training	Cost of Training (Ksh.)	Enrolled	Drop-Out (%)	Graduated	Registered	Active	MoH[30]	KNH[31] / MTRH[32]	Private Facilities	Private Practice	Outflow
Doctors	6	981,000	3,457	8	517	8,682	3,443	2,235	86	1,122	246	169
Dentists	5	569,000	291		71	1,045	712	210	25	244	233	28
Pharmacists	5	488,000	826	1	105	2,202	890	761	26	103	392	49
Pharmaceutical Technologists	3	72,000	434	15.4	293	6,204	2,755	396	98	2,261		145
Nurses	3- 4	84,000	8,873	5	3,768	66,621	34,381	20,449	2,495	11,347	*	1,671
Health Records Information Officers	2-3	72,000	909		812		1,301	608	171	522		55
Physiotherapists	3-4	72,000			110		911	477	106	328		33
Clinical Officers	3	508,000	1,665	1.6	1,564	13,206	7,043	3,208	189	3,646		308
Laboratory Technologists	3	72,000		6.3	1,113		4,863	845	238	3,780		247

[30] Ministry of Health
[31] Kenyatta National Hospital
[32] Moi Teaching and Referral Hospital