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MAPPING INTERNATIONAL UNIVERSITY PARTNERSHIPS IDENTIFIED BY EAST AFRICAN UNIVERSITIES AS STRENGTHENING THEIR MEDICINE, NURSING, AND PUBLIC HEALTH PROGRAMS

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ABSTRACT

BACKGROUND: International university partnerships are recommended for increasing the capacity of sub-Saharan African universities. Many publications describe individual partnerships and projects, and tools are available for guiding collaborations, but systematic mappings of the basic, common characteristics of partnerships are scarce.

OBJECTIVE: To document and categorize the international interuniversity partnerships deemed significant to building the capacity of medicine, nursing, and public health programs of 4 East African universities.

METHODS: Two universities in Kenya and 2 in Tanzania were purposefully selected. Key informant interviews, conducted with 42 senior representatives of the 4 universities, identified partnerships they considered significant for increasing the capacity of their institutions' medicine, nursing, and public health programs in education, research, or service. Interviews were transcribed and analysed. Partners were classified by country of origin and corresponding international groupings, duration, programs, and academic health science components.

FINDINGS: One hundred twenty-nine university-to-university partnerships from 23 countries were identified. Each university reported between 25 and 36 international university partners. Seventy-four percent of partnerships were with universities in high-income countries, 15% in low- and middle- income countries, and 11% with consortia. Seventy percent included medicine, 37% nursing, and 45% public health; 15% included all 3 programs. Ninety-two percent included an education component, 47% research, and 24% service; 12% included all 3 components.

CONCLUSIONS: This study confirms the rapid growth of interuniversity cross-border health partnerships this century. It also finds, however, that there is a pool of established international partnerships from numerous countries at each university. Most partnerships that seek to strengthen universities in East Africa should likely ensure they have a significant education component. Universities should make more systematic information about past and existing partnerships available publicly.

1.1 Introduction

International partnerships between universities are identified as a means of building the capacity of health professional programs (HPPs) of universities in sub-Saharan Africa (SSA) (WHO, 2006, Frenk et al., 2010, Mulvihill and Debas, 2011). The New Partnership for Africa's Development (NEPAD, 2003) identified such partnerships as an "essential" step for addressing the critical shortage of skilled human resources for health in SSA - the region of the world with the greatest burden of disease relative to its health workforce (WHO, 2008).

The Sub-Saharan African Medical School Study (Mullan et al., 2010) characterizes international partnerships as "important assets" for their support of education, research, and service mandates through a variety of activities, including student and faculty exchanges, research, and curriculum development. Existing literature identifies numerous examples of university-to-university partnerships with SSA universities. Categorizing them by general discipline is sometimes straightforward; for example, by medicine (Einterz et al., 2007, Collins et al., 2010), nursing (Swan et al., 2003, Astle, 2008, Kohi et al., 2010), or public health (Ezeh et al., 2010), but sometimes they bridge disciplines (Binanay et al., 2015). Clear examples of partnership activities focusing on education (Oman et al., 2007, Pallangyo et al., 2012, Amde et al., 2014), research (Zumla et al., 2010, de-Graft Aikins et al., 2012), or service (Inui et al., 2007) also exist. Sometimes partnerships are clearly multidisciplinary, by including at least 2 health professions, and more than 1 component of education, research, or service (Binanay et al., 2015). North-South partnerships are identified by the Academy of Medical Sciences and Royal College of Physicians (The Academy of Medical Sciences and Royal College of Physicians, 2012) as the "traditional model" of academic partnerships before stating that South-South partnerships, networks, and consortia have increased in number this century.

However, after identifying the type of activities partner universities engage in and noting that medical schools have "an array" of international university partners, the Sub-Saharan African Medical School Study (p. 95) concludes that "an area for future research is how to improve and measure these collaborations to maximize efficacy and provide evidence for

success." An initial step toward achieving this need is identifying systematically the number and types of international university partnerships at specific universities in SSA.

1.1.1 Objective

The objective of the present study was to document and categorize the range of international university-to-university partnerships deemed significant for building the capacity of medicine, nursing, and public health professional programs at 4 East African universities.

2.1 Methods

This study used a concurrent mixed methods design. We conducted key informant interviews and reviewed grey literature and published reports. Quantitative analysis has dominant status (Leech and Onwuegbuzie, 2010) in this paper. Qualitative viewpoints are included to emphasize key issues and provide prospective

2.1.1 University Selection

We sought a total of 4 universities in 2 countries (Kenya and Tanzania), within 1 distinct region of SSA, to explore diversity within broadly similar political, economic, and social contexts. All universities had to have medicine, nursing, and public health programs. Using purposeful selection, we included the oldest medical schools in each country and a private university, because the number of private universities in SSA has increased significantly in the past 2 decades (Thaver, 2008) The 4 universities chosen each had a teaching or affiliated hospital. Moi University (MU), Eldoret, Kenya, was selected because its partnership with Indiana University has been referred to as successful (Obamba et al., 2013) and has been used as a case study more than once (Obamba et al., 2013, Park et al., 2011, Mamlin et al., 2004). The University of Nairobi (UoN), the second Kenyan site, is the country's oldest and largest medical school. Tanzania has close cultural and economic

ties with Kenya, and its first medical school, Muhimbili University of Health and Allied Sciences (MUHAS) in Dar es Salaam, was founded within 5 years of UoN's[1] in the 1960s.

Kilimanjaro Christian Medical University College (KCMUCo) in Moshi is a private university and shares commonality with UoN and MU in 2 important ways for this study. First, both KCMUCo and UoN have National Institute of Health Medical Education Partnership Initiative grants - KCMUCo with Duke University and UoN with the University of Maryland and the University of Washington (Collins et al., 2010). Second, KCMUCo and MU have a common partner in Duke University, because it is also a member of the Academic Model Providing Access to Healthcare (AMPATH) Consortium led by Indiana University.

2.2.2. Key Terms: Academic Health Science, Partnership, Capacity Building

We begin by defining key terms used in this study: *academic health science, partners* and *partnership,* and *capacity building.* The present study focused on *academic health science* at universities. This includes health education, research, and service – the first 2 components within medicine, nursing, and public health programs at 4 universities, the third component at their affiliated teaching hospitals. These institutions are often referred to as academic health science centres (AHSCs) (Smith and Whitchurch, 2002), or academic health centres (Kohn, 2004). Although there is no standard definition for AHSCs, they generally include a medical school or program, another health professional school or program, and an affiliated teaching hospital. AHSCs are characterized as having tripartite missions that include education, research, and service. However, because *academic health science centre* is not a term used widely in SSA and this study did not explore the political and structural relationship issues between the 4 universities and their teaching hospitals in

[1] The first medical school in East Africa, Makerere University Medical School, was found in Kampala, Uganda in 1924. It is today housed within Makerere University College of Health Sciences. (See: http://90.mak.ac.ug/) Makerere produced physicians for Kenya and Tanzania before, what are today, the schools of medicine of UoN and MUHAS, were founded, in 1967 and 1963, respectively (see: http://med-school.uonbi.ac.ke/ and http://som.muhas.ac.tz/).

detail – although challenges were observed – the study usually refers to universities instead of AHSCs.

The next terms are *partner* and *partnership*. A *partner* in this study is a university or a consortium of universities that engages in an education, research, or service activity with 1 or more of the focus universities of this study – MU, UoN, KCMUCo, or MUHAS – in medicine, nursing, or public health. Partners generally share risks and benefits (COD, 2001). For this paper, a *partnership* is the association between 1 of the focus universities and a partner university or a consortium.

Capacity is "it is the ability of individuals, organisations or societies to set and implement development objectives on a sustainable basis." [(Milèn, 2001), p.4]. *Capacity building* is the process of developing this ability. Once an institution is established, it may be more appropriate to use the term *capacity strengthening* instead of *capacity building*, to recognize the existing capacity.

2.2.3 Sampling and Data Collection

We interviewed all current lead health representatives (e.g., provost, principal, vice-chancellor[2]) of each university and all current deans (or equivalent) of medicine, nursing, and public health. We interviewed at least 1 current lead representative for research and 1 current or past lead representative of each university's teaching hospital. We also interviewed past deans, research heads, and other senior representatives of each institution as appropriate. Between July 2013 and July 2014, we interviewed between 9 and 12 representatives per university (MU n=10, UoN n= 9, KCMUCo n=12, MUHAS n=11) for a total of 42 representatives. In a number of instances, representatives held more than 1 senior post at the institution during his or her career, but he or she was counted for only 1

[2] MU and UoN are clearly part of larger institutions. KCMUCo is a constituent college of Tumaini University but is in the process of becoming independent. MUHAS is an independent institution.

post. The interviews lasted between 32 and 133 minutes, with most lasting between 60 and 90 minutes.

The overall question we asked each key informant (KI) was: What in your opinion have been or are the 10 most significant international partnerships since 1991 for strengthening the medicine, nursing, and/or public health programs of your institution? The word significant was not defined. We are confident it was understood by all KIs to mean "important enough to merit attention" (COD, 2001). We stressed that the partnerships could be in any combination of the 3 health professional programs; focus on education, research, and/or service; be ongoing or have concluded; but needed to be with an university or a consortium of universities outside the focus university's country in Africa, Asia, Europe, Oceania, or the Americas [see Appendix 1: Phase 1 Key Informant Interview Guide]. In a number of instances additional information or clarification was sought in follow-up interviews, via e-mail, telephone, or SMS.

We triangulated data gathered from the key informant interviews with grey literature from MU, UoN, KCMUCo, and MUHAS (e.g., annual reports, websites), published reports, and the websites of partners identified and donors who funded the partnerships. More than 450 websites and documents were referred to [see: www.hppafrica.org/research]. They served to clarify or confirm details about the partnerships when findings differed between key informant interviews for the same partnership or when additional details were needed.

2.2.4 Ethics Approvals

Ethics approval was sought and obtained from the Senate Research Committee of the University of the Western Cape (13/5/15); Institutional Research and Ethics Committee Secretariat of Moi Teaching and Referral Hospital/ Moi University School of Medicine; Ethics and Research Committee, Kenyatta National Hospital/ University of Nairobi; and National Institute for Medical Research in Tanzania. Research clearance was received from the Tanzanian Commission for Science and Technology.

2.2.5 Data Management and Analysis

We transcribed the interviews. Data from the transcriptions were then used to complete Microsoft Excel tables of international partnerships identified by each respondent, in

keeping with framework analysis approaches (Boyd et al., 2013). We produced a summary table of all the partnerships. For each partnership we identified (1) the name of partner institution; (2) the country in which partner was based; (3) the duration of partnership in years; (4) number of KIs who identified partnership; (5) whether the partnership was active or inactive; (6) HPPs (medicine, nursing, and/or public health) involved; (7) components (education, research, and/or service) of AHSCs included in partnership; and (8) key activities and outputs of the partnership.

Fifteen non-university partnerships and non-health sciences university-to-university partnerships mentioned were not included in the analysis because they did not fit the criteria of being primarily university-to-university partnerships, including affiliated teaching hospitals, with at least 1 of the 3 HPPs included in this study. These included partnerships with nongovernmental organisations, bilateral donor agencies, foundations, pharmaceutical companies, consortia that were not principally between universities, and university-to-university partnerships not including the health sciences. In some cases, however, these organisations were considered a significant partnership for some HPPs; for example, Pacific Institute for Research and Evaluation (PIRE), a non-university, not-for-profit organisation in Chapel Hill, North Carolina, was considered one of the most significant partnerships by a MU nursing representative.

The final summary table of all partnerships identified was then analysed using SPSS. Frequencies and crosstabs were produced. A description of each of the fields analysed using SPSS appear in Appendix 2, Data Fields for Each International Partnership. This paper maps the general characteristics of the partnerships identified. It does not report on the value or ranking of the partnerships. This was reported in a subsequent paper, *What makes international global health university partnerships higher-value? An examination of partnership types and activities favoured at four East African universities*. [see Chapter 6].

3.1 Findings

3.1.1 Number of Partners Identified

A total of 129 international, university partners were identified: 33 by MU representatives; 36 by UoN; 25 by KCMUCo; and 35 by MUHAS.

3.1.2 Regions and Countries of Partners

The 129 partners were from 23 countries, not including the countries of the consortia members because they were listed simply as "consortium." All World Health Organization (WHO) regions had at least 1 partner, although all of the partners from the Americas were from North America[3]. The majority of partners were from high-income countries from the Global North, specifically North America and Western Europe, as shown in Figure 1.1: Distribution of all partners identified by three international groupings. The most partners, 41 (31.8%), were from the United States, followed by the United Kingdom, 11 (8.5%); South Africa and Sweden, 8 (6.2%) each; Norway, 7 (5.4%); Canada, 6 (4.7%); and Japan and the Netherlands, 4 (3.1%) each. The remaining 26 (20.2%) partners were from 15 countries; 11 of these countries had 2 partners and 4 countries had 1.

Twelve percent of partners (15 of 129) were from the WHO African Region, although from only 5 countries, and the majority, 8 of the 15 (53%), were South African universities. Ten partners (8%) were Asian or Oceanic universities: 4 from Japan, 2 each from Australia and South Korea, and 1 each from India and Singapore. In addition, India was mentioned twice as a secondary partner in a number of bilateral partnerships with universities in high-income countries. Only UoN and MUHAS identified partners from Asia. No partner from China was identified, although it was noted that the government of Kenya had approached China to upgrade the Moi Teaching and Referral Hospital facilities but the funding would be government-to-government, likely a soft loan.

Grouping the partnerships into North and South equates perfectly with high-income Organization for Economic Co-operation and Development (OECD) countries and lower

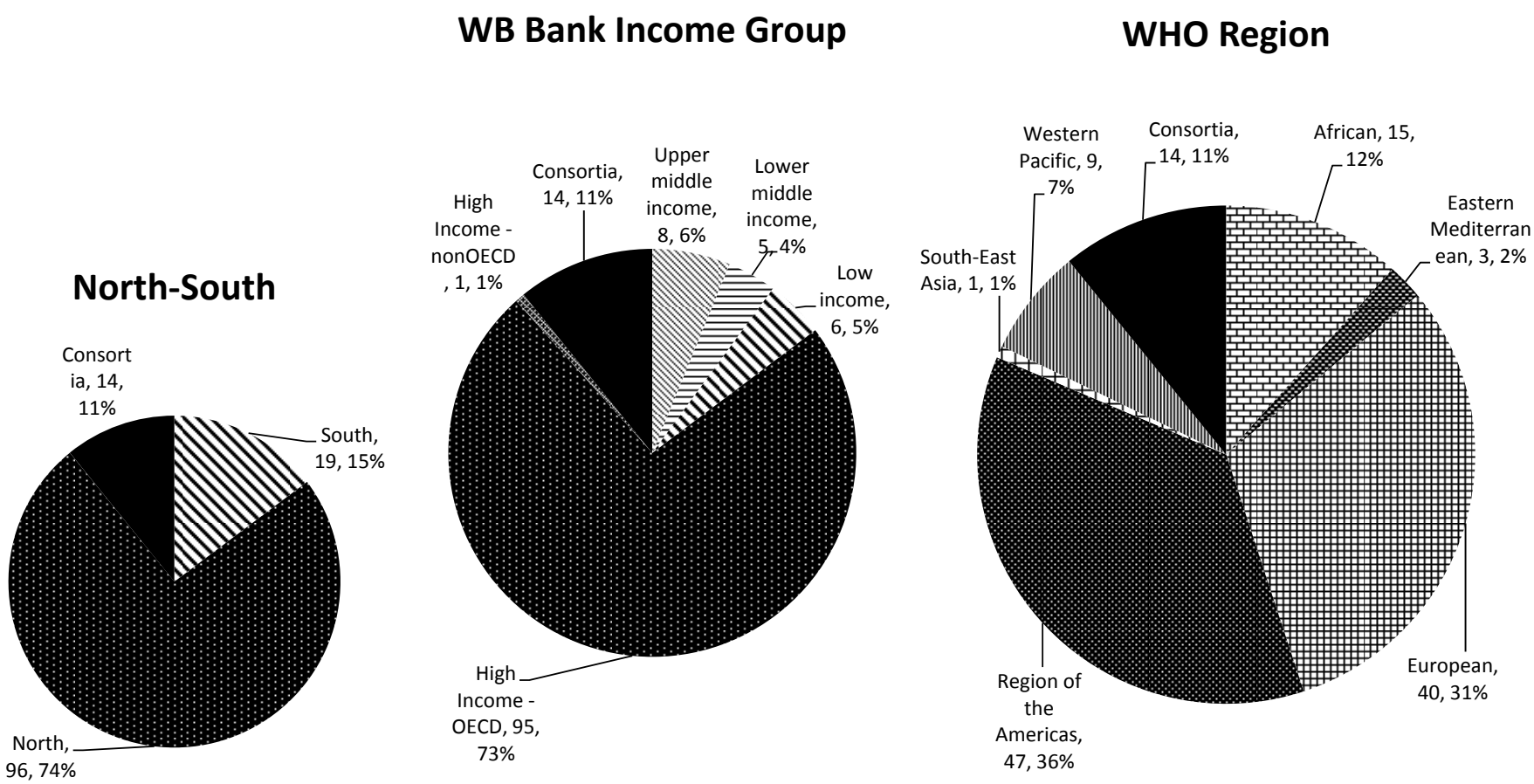
[3] There was one example of a Moi University medical student doing a placement in Mexico City through its partnership with Indiana University. Cuba and Brazil appear to be the two principal countries in the Americas outside of North America partnering with SSA countries. Cuba does not focus on building the capacity of SSA universities but has a long history of training African students in Cuba to become physicians and placing Cuban physicians with government health facilities in Africa. See: COOPER, R. S., KENNELLY, J. F. & ORDUÑEZ-GARCIA, P. 2006. Health in Cuba. *International Journal of Epidemiology,* 35**,** 817-824.. Recently, Brazil has become engaged quite significantly in SSA, especially with Lusophone countries. See: GHSI 2012. Shifting Paradigm: How the BRICS are Reshaping Global Health and Development. New York: Global Health Strategies initiatives.

middle-income countries, with the exception of partnership between UoN and the National University of Singapore, because Singapore is a high-income country but not an OECD member.

Of the 19 southern partners, 13 were from middle-income countries – South Africa (8), Egypt (2), India (1), Nigeria (1), Sudan (1); and 6 partnerships with universities in low-income countries in Kenya[4] (2), Malawi (2), and Uganda (2) – were identified. All the low-income partnerships were with universities in neighbouring countries. India was the only non- African lower middle-income country housing a partner. The only non-consortium partnership identified with a university from Central or West African countries was between KCMUCo and the University of Ibadan in Nigeria, although it was project-based and included a northern partner, Newcastle University, United Kingdom. A representative from the University of Ibadan was the project's principal investigator. Twenty countries were represented in the consortia: Botswana, Canada, Democratic Republic of the Congo, Ethiopia, Finland, Kenya, Malawi, Mozambique, Namibia, Nigeria, Norway, Rwanda, South Africa, Sweden, Switzerland, Tanzania, Uganda, the United Kingdom, the United States, and Zambia. Half (10/20) of these countries also had bilateral partnerships with at least 1 of the 4 focus universities.

[4] At the time the data were collected, Kenya was a low-income country. Kenya became classified as a lower middle-income country by the World Bank in July 2015.

Figure 1.1: Distribution of all partners identified by three international groupings



3.1.3 Consortia

Ten distinct consortia were mentioned a total of 14 times[5], as 3 consortia were mentioned by representatives at more than 1 of the 4 universities. Because perspectives of the consortia varied between the KIs, each incidence is counted in the findings. The 10 consortia were Afya Bora; College of Ophthalmology of Eastern Central and Southern Africa (COECSA); Consortium for Advanced Research Training in Africa (CARTA); Inter-professional Team Education Promoting Public Health (I-Step); Higher Education Alliance for Leadership Training for Health (HEALTH Alliance); Leadership Initiative for Public Health in East Africa (LIPHEA); the Norwegian Agency for Development Cooperation's Programme for Master Studies (NOMA); One Health Central and Eastern Africa (OHCEA); Southern African Centre for Infectious Disease Surveillance (SACIDS); and Training Health Researchers into Vocational Excellence in East Africa (THRiVE). Four of the 10 – CARTA, COESCSA, HEALTH Alliance and SACIDS – have only southern members, although they are all linked to northern organisations to some degree; for example, although CARTA's members are all SSA universities, it has northern partners. Of the 7 consortia with northern partners, only 1, CARTA, has northern partners from more than 1 country.[6]

3.1.4 Coordinated Partners

In 2 separate cases, partners were sometimes mentioned individually and sometimes within a consortium. This was true of Indiana University, Brown University, Duke University, University of Toronto, University of Utah with MU and Karolinska Institute, Umea University, University of Gothenburg, and Uppsala University with MUHAS. In both cases, the KIs referred to the individual universities more often than the consortia they form. In the case of the North American universities, the AMPATH Consortium was usually referred to as the Indiana-led consortium in recognition that Indiana was the first of these universities to partner with MU; the other universities started working with MU by linking with Indiana University, and Indiana leads the AMPATH Consortium. In the case of the Swedish universities working with MUHAS, either the Karolinska Institute was mentioned as the lead

[5] KCMUCo is involved in a number of consortia projects and partnerships in addition to COECSA and THRiVE: for example, Building Stronger Universities; the European and Developing Countries Clinical Trials Partnership; Gates Malaria Partnership; and Malaria Capacity Development Consortium. These were sometimes mentioned, although usually after the lead university partner. For this reason, the lead university is noted, not the consortia.

[6] THRiVE's 2 northern partners are from the United Kingdom, although its advisory board had a Swedish member (THRiVE, 2014).

or the partnership was referred to as the MUHAS-SIDA partnership. SIDA is the Swedish International Development Agency. It is the official bilateral development agency of the Government of Sweden.

MUHAS' partnerships with universities funded by the Norwegian Agency for Development Cooperation were sometimes mentioned by the project (e.g., NUFU, NOMA) or by the donor or by mentioning the partner universities. These partnerships sometimes involved multiple universities, but because the KIs focused on the role of individual universities – University of Bergen and University of Oslo – they were listed individually. The consortium nature of MUHAS' NOMA nursing project was emphasized by KIs, so it was identified as a consortium. Boston University and University of Ibadan were treated individually, although their partnerships with MUHAS and KCMUCo, respectively, also included another international partner.

3.1.5 How Old Is the Partnership? Still Alive? Or Taking a Break?

Determining the length of some partnerships was difficult because responses varied for representatives of the same institution. Some partnerships were active for a period with 1 HPP, then added another HPP to the partnership. At other times an individual who was involved with a partner from the beginning would provide a significantly earlier start date for the partnership than another representative of the same university. Consider, for example, the duration of MUHAS's partnership with the University of Bergen in Norway. Nine representatives identified it as a significant partnership but only 6 stated its duration, and the time frame ranged from 6-25 years. Respondents generally gave the number of years their HPP or they themselves had been involved, not the university overall, although some respondents did acknowledge that the university had been partnered with an institution for some time but only recently began partnering with their HPP. Finally, dating a partnership can also discount what may have come before it, as in the case of COECSA. Although it was only 2 years old when this study was conducted, the 2 consortia that merged to form it in 2012 – the Eastern Africa College of Ophthalmologists and the Ophthalmological Society of Eastern Africa – were 7 and more than 40 years old, respectively (Kagame, undated, Nsibirwa, 2012, COECSA, 2012).

The length of the partnership is shown in Table 1.1 (Duration of partnerships by three international groupings of countries) for the 109 of 129 partnerships whose duration was determined. Fifty partnerships, 39% of all partnerships, started in the last 5 years and were

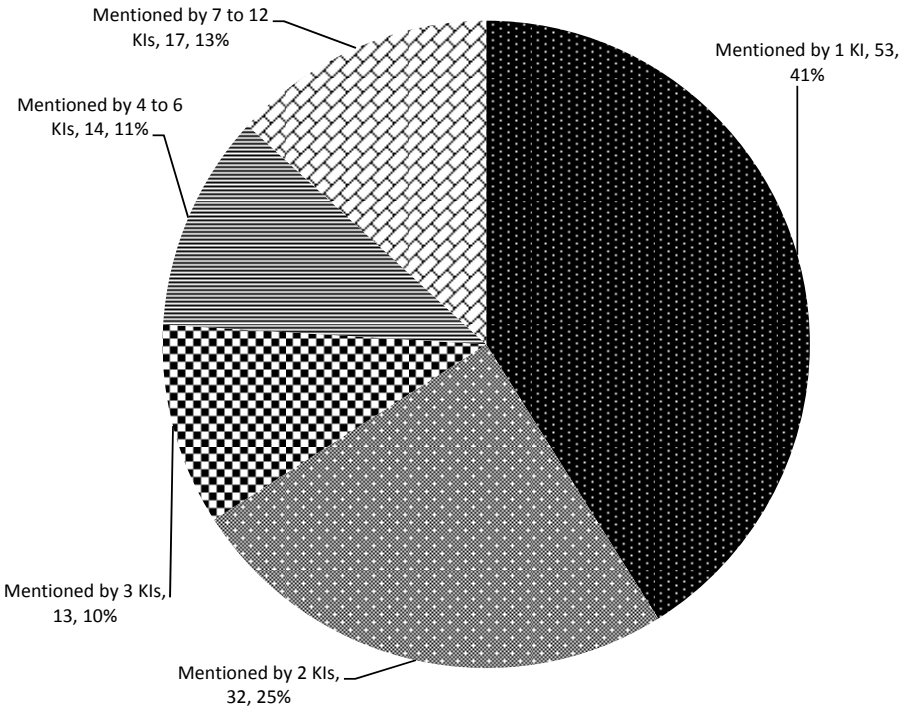
active. Twenty-four of the partnerships lasted 15 years or more, and 79% (19 of 24) of these were still active. One hundred and three (103) of the 129 partnerships (80%) were considered active. Sixty- eight percent (68%), 15 of 22, of the inactive partnerships (when the duration was known) lasted 5 years or less. Of the 26 partnerships considered inactive, 11 had been project specific; 4 were considered to be dependent on 1 individual, and when that individual switched universities, the partnerships either moved with them or ended; 4 did not have current activities but may restart (i.e., hiatus); 3 had been short, contributory or advisory relationships; 2 faded over time; 1 consortium project transitioned into another consortium; and 1 partnership proved not to be a good match and ended within the first year. More than one-third, 9 of 26 (35%), of all partnerships considered inactive were at KCMUCo. Thus, more than one-third, 9 of 25, of KCMUCo's partnerships were considered inactive; 6 (18%) of MU's, 6 (17%) of MUHAS's, and 5 (14%) of UoN's partnerships were considered inactive. Two UoN partnerships started more than 30 years ago and were still ongoing.

Table 1.1: Duration of partnerships by groupings of countries							
	Duration of Partnerships, in years (n=109)						
Income Level and Region of Partners	5 or less	6 to 10	11 to 15	16 to 20	21 to 25	26+	sub-total
High Income – Americas	26	4	1	6	3	1	41
High Income – Europe	11	4	7	2	3	4	31
High Income – Other	6	0	0	1	0	0	7
Lower Middle	3	0	1	0	2	0	6
Upper Middle	3	1	0	0	0	0	4
Low Income	4	2	0	0	0	0	6
Consortia	12	2	0	0	0	0	14
TOTALS	**65**	**13**	**9**	**9**	**8**	**5**	**109**
% of Total	60%	12%	8%	8%	7%	5%	100%
Cumulative %	60%	72%	80%	88%	95%	100%	

3.1.6 Who Knows Who?

Approximately two-thirds, 85 of 129 (66%), of the partnerships were mentioned by 1 or 2 representatives [see: Figure 1.2: Number of respondents who identified each partnership]. Only 2 consortia, NOMA and THRiVE, were named by more than 2 representatives. Almost a quarter, 31 of 129 (24%), of partnerships were identified by between 4 and 12 representatives. The only 2 partner universities identified by all KIs of the respective focus universities were Duke University at KCMUCo and Indiana University at MU, although at least 1 Swedish university was mentioned by each MUHAS representative. KIs often mentioned partners with which they had direct contact; for example, if they earned their PhD linked to a partner, if a student or students they were supervising were involved in a partnership, if they were the principal investigator for a project involving a partner, or if they coordinated some aspect of a partnership. Only 9 of the medicine-only partnerships were identified by 3 or more representatives, leaving 37 of 46 (80%) medicine-only partnerships identified by only 1 or 2 representatives. More than half of the partnerships, 48 of 83 (58%), involving nursing or public health were mentioned by only 1 or 2 representatives. The partnership between UoN and Ludwig Maximilian University of Munich, Germany, was mentioned by 3 of the 9 UoN KIs, although it has only involved ophthalmology and none of the UoN representatives interviewed were ophthalmologists.

Figure 1.2: Number of respondents who identified each partnership



3.1.7 Medicine, Nursing, or Public Health?

As shown in Table 1.2 (HPPs by World Bank Income Groups), 81 of 129 (63%), of all partnerships include only 1 HPP, with medicine-only partnerships being the most common. Seventy percent of all partnerships, 90 of 129, included medicine to some extent. Thirty-seven percent of partnerships, 48 of 129, included nursing to some extent. Forty-five percent of partnerships, 58 of 129, included public health to some extent. However, it was not the case that the level of activity or outputs realized for each HPP was necessarily equal or that the respective HPPs were involved in the partnership simultaneously in partnerships including more than 1 HPP. Consider MUHAS's partnership with Dalhousie University in Canada. The partnership began in the late 1980s when the Canadian university helped Muhimbili establish its bachelor of science in nursing degree. After the nursing program was established, there was a hiatus until the mid-2000s when activities recommenced between the 2 universities, but this time between their medical schools.

Another example is the partnership between Indiana University and MU. Although there have been some activities with the Schools of Public Health and Nursing, the bulk of activities have been with the School of Medicine, leading 1 representative to conclude that Indiana's

"level of support in Medicine is so, so high you can't compare [it] to these others [i.e. schools] that are spread out."

Table 1.2: HPPs by World Bank Income Groups

Income Level & Region of Partners	# of Partners Identified	HPPs Involved n=129						
		Med	NUR	PH	Med/Nur	Med/PH	Nur/PH	ALL
High Income - Americas	**47**	13	3	8	4	8	3	8
High Income - Europe	**38**	15	9	3	2	3	0	6
High Income - Other	**11**	9	1	1	0	0	0	0
Lower Middle	**5**	3	0	0	1	1	0	0
Upper Middle	**8**	3	0	2	2	0	1	0
Low Income	**6**	1	2	0	0	1	0	2
Consortia	**14**	2	1	5	0	3	0	3
TOTALS	**129**	**46**	**16**	**19**	**9**	**16**	**4**	**19**
% of Total	**100%**	36%	12%	15%	7%	12%	3%	15%
Cumulative %		36%	48%	63%	70%	82%	85%	100%

3.1.8 Supporting the tripartite mission?

Almost all partnerships (119 of 129, or 92%) included an education component, with almost half being education only [see Table 1.3: AHSCs Components in Partnerships by World Bank income group]. Almost half of all partnerships (47%, or 60 of 129) included a research component. Approximately one-quarter (31 of 129 [24%]) included a service component.

Seven of the 10 partnerships that did not include an education component were with North American partners. One partnership each from a European, high-income other, and lower middle-income country did not include an education component. More than one-third of the North American partnerships (17 of 47 [36%]) included service components. This compares to only 9 of the 68 (13%) from other regions. The consortia partnerships including all components were OHCEA (3) and LIPHEA (1), funded by the US Agency for International Development, and the HEALTH Alliance that was formed by the Eastern and Central African LIPHEA partners.

The specific type of activities, or results achieved, within the components were usually specified. A wide variety of education, research, and service outputs were produced through the partnerships [see: Box 1.1: Types of activities and outputs mentioned by component]. Some of the outputs realized were only possible after other outputs were achieved or realized currently; for example, PhD research after education and highly cited research after service delivery. Although representatives were not asked about partnerships that supported

infrastructure development (e.g., construction of a building), some KIs identified such activities as valuable.

Table 1.3: AHSCs components in partnerships by World Bank Income Groups								
Income Level & Region of Partners	# of Partnerships Identified	Components (n=129)						
		Edu	Res	Ser	Edu/Res	Edu/Ser	Res/Ser	ALL
High Income - Americas	**47**	17	3	0	10	3	4	10
High Income - Europe	**38**	18	0	0	14	4	1	1
High Income - Other	**11**	6	1	0	2	1	0	1
Lower Middle	**5**	4	0	0	0	0	1	0
Upper Middle	**8**	5	0	0	3	0	0	0
Low Income	**6**	4	0	0	2	0	0	0
Consortia	**14**	6	0	0	3	1	0	4
TOTALS	**129**	**60**	**4**	**0**	**34**	**9**	**6**	**16**
% of Total	**100%**	47%	3%	0%	26%	7%	5%	12%
Cumulative %		47%	50%	50%	76%	83%	88%	100%

Box 1.1: Types of activities and outputs mentioned by component

[Note: i) underlined sub-components stated to be particularly significant by some key informants for achieving capacity development of their institution; ii) not necessary distinct (e.g. 2.3 can also be 2.3)]

1 Education

- 1.1 Examination (external examiners) – not considered capacity building by all representatives
- 1.2 Curriculum development
  - 1.2.1 Pedagogy
  - 1.2.2 Diplomas
  - 1.2.3 Short courses
  - 1.2.4 Undergraduate Degrees
  - 1.2.5 Master's Degrees
  - 1.2.6 PhD degrees
  - 1.2.7 Fellowships
- 1.3 Student Exchanges
  - 1.3.1 One-way
  - 1.3.2 One-way - but partnering students
  - 1.3.3 Two-way - unbalanced
  - 1.3.4 Two-way - reciprocal

2 Research

- 2.1 Highly cited
- 2.2 Publishable
- 2.3 Within a PhD

3 Service Delivery

- 3.1 Care within a Teaching Hospital
- 3.2 Care within the urban area of a University
- 3.3 Care in rural area
- 3.4 Prevention – health promotion

4 Infrastructure Development & Equipment & Supplies

- 4.1 Provision of equipment & supplies - ICTs, library, laboratory - common
- 4.2 Construction of facilities - learnings centres, research facilities, hospitals.

4.1 Discussion

4.1.1 A multitude of partners at each university

Our mapping of international partnerships significant for capacity building at MU, UoN, KCMUCo, and MUHAS identified that each of the 4 universities has had a multitude of partners since 1991 (1997 in the case of KCMUCo[7]). Ease of identifying partners from publicly available sources for the 4 universities vary significantly between the 4 institutions, generating challenges in obtaining precise estimates of partnerships. MUHAS's "Research Links and Collaboration" menu item on its website[8] and similar sections in its annual reports are the most comprehensive, and report on current activities (see http://www.muhas.ac.tz/index.php/ annual-reports) (MUHAS, 2011, MUHAS, 2014b, MUHAS, 2009b). The 2012-2013 annual report [(MUHAS, 2014b), p. 31] noted 78 research partnerships with foreign institutions. The report also identifies collaborations by the various schools, the names and principal investigators of the 19 new projects and 9 projects that ended that year and provides a summary progress report for each of the 103 current research projects, although research projects don't always identify partners [(MUHAS, 2014b), pp.108-145]. Student exchange activities are reported separately. UoN's annual reports provide names of partners but few details (see http://www.uonbi.ac.ke/uon- reports) (University of Nairobi, University of Nairobi, 2012, University of Nairobi, 2011, University of Nairobi, 2010) . Moreover, it is difficult to get a sense of the arrangements; for example, in the 2012 annual report each university involved in OHCEA is mentioned individually but no mention of OHCEA is made [(University of Nairobi, 2012), p72]). Both KCMUCo and MU provide limited partnership information online. The former has focused on the Medical Education Partnership Initiative project with Duke and THRiVE. KCMUCo annual reports do not appear to be available online, although some information on interuniversity partnerships is provided in the annual reports of the affiliated teaching hospital (KCMC, 2011) and hard and soft-copy profiles of the research institute, Kilimanjaro Clinical Research Institute (KCMC, 2011, KCRI, 2012, Kilimanjaro Clinical Research Institute (KCRI), updated) One of clearest summaries of partnerships is KCMUCo's 2013 internal self-assessment [(Mallya

[7] What is today known as KCMUCo was founded in 1997. However, some of its partners predate the establishment of the university. They started with KCMC. KCMC was founded in 1971.

[8] MUHAS's website is http://www.muhas.ac.tz/. MU College of Health Sciences' website is http://chstest.mu.ac.ke/. UoN College of Health Sciences' website is http://chs.uonbi.ac.ke/. KCMUC's website is http://www.kcmuco.ac.tz/.

et al., 2013), p.54]. Twenty-four non-donor international linkages are listed, 14 of which are international universities and 4 of which are consortia involving universities. MU's website provides a link to AMPATH Kenya (www.ampathkenya.org). Online access to MU's annual reports and strategic plans does not appear to be available, and its 2009-2015 strategic plan only identifies 3 partners, only 2 of which work with the College of Health Sciences (Moi University, undated).

Another MU document identifies a total of 6 partnerships for the Schools of Nursing and Public Health, but Medicine's partnerships are not mentioned (Moi University, 2012). In many cases, the 4 universities identify international university partners in documents when identifying other collaborators such as local, industry, and donor partners. Hence, substantial challenges remain in precisely determining information on international partnerships.

4.1.2 Geographic/income group distribution

The geographic distribution of partnerships is consistent with previous findings that report that historically capacity building partnerships with SSA universities have been North-South in nature, especially with North American and European universities (The Academy of Medical Sciences and Royal College of Physicians, 2012). There were some partnerships with high-income countries in Asia, but they remain limited in number and scope of activities. Our findings bring clarification to the type of South-South and African-African partnerships in existence. Except for the 1 specified and the 2 unspecified Indian partners, all of the lower middle-income country partners were in Africa. Furthermore, the only partnerships with low-income country universities were with those in neighbouring countries, and the only other non- consortium partners were from Egypt, Nigeria, and South Africa, the 3 dominant science countries in SSA.47 The findings of our study also support Brautigam's (2009) analysis that, in health, the Chinese government is focusing on hospital-to-hospital partnerships and not university-to-university.

4.1.3 Duration and status of partnerships

Although subject to the recall bias of KIs, this study provides a rare examination of the duration and status of university- to-university partnerships. By asking the representatives of the 4 focus universities to identify partnerships that have existed "since 1991," we permitted respondents to consider international partners with whom they have been partnered for more than 20 years in addition to younger partnerships. That 31 of the 109 partnerships (28%) of the partnerships whose duration were identified were more than 10 years old supports the

published reports indicating that capacity-building partnerships often take time to develop (Casey, 2008, Shivnan and Hill, 2011, Horton et al., 2003). However, that more than half of this set of partnerships was 20 years or older leads to questions about whether interactions that are 10-15 years long should be considered "long-term" partnerships, as commentators do (Daibes and Sridharan, 2014). That 57% of the partnerships were established over the past 5 years and were still active roughly parallels the findings of indicating the growth of university global health partnerships of North American universities[9].

4.1.4 Types of HPPs and number of representatives who identified a Partner

The overall research question for this study sought to implement the recommendation of the Commission on Medical Education for the 21st Century to look beyond "the silos of individual professions" (Frenk et al., 2010) and included 3 health professional programs. Unsurprisingly, considering the leading role of medicine and historically siloed natured of the health professions, 70% of all partnerships included medicine and almost two-thirds (63%) of partnerships included only 1 of the 3 HPPs. Nevertheless, that does mean that 37% of partnerships included at least 2 of the HPPs. Fifteen percent included all 3 HPPs to some extent, although the activities within these partnerships were not necessarily integrated, nor was the level of activity necessarily equal between the HPPs. That 66% of partners were identified by only 1 or 2 representatives may indicate that many partnerships include only a few representatives at an institution and reflects the focused nature of academic work, existing disciplinary boundaries, and the siloed nature of HPPs.

4.1.5 Components involved

For 2 reasons, it is unsurprising that almost all partnerships included an education component to some degree. One, addressing capacity building often implies an educational component, because this term is developmental in nature, and Kenya and Tanzania are well known to have a shortage of health professionals working in country (Kwesigabo et al., 2012, Wakaba et al., 2014). Two, the shortage of health researchers in SSA and the need to include training in research are well documented (Jentsch and Pilley, 2003, Chu et al., 2014, Chandiwana and

[9] Interestingly, Matheson et al sent surveys to 120 North American institutions, but only 35 responded. Of these 140 institutions sent surveys, 26 were identified as partner by Moi, UoN, KCMUCo, and MUHAS representatives in our study. Only 7 of these 26 universities responded to the survey sent by Matheson et al.

Ornbjerg, 2003, Ijsselmuiden et al., 2012). Therefore, it is unsurprising that only 15 partnerships were identified that were research or research or service only.

4.1.6 Limitations and directions for further research and analysis

This study took place in 2 countries in 1 distinct region: East Africa of SSA. Both countries were former British colonies, Anglophone, members of the Commonwealth, and large in terms of population and recipients of foreign aid in 2013, Tanzania and Kenya ranked fifth and sixth in terms of human population (World Bank, 2015) and second and third in terms of overseas development assistance (OECD, 2015). These facts are important when considering the generalizability of this study's findings to the WHO African Region, which includes 47 countries with varied colonial, linguistic, and academic histories.

We could not obtain centrally produced lists of historical or current international projects or partnerships at any of the institutions over time, precluding more rigorous cohort analyses. It was not possible to determine the statistical significance of associations because of the small counts (<5 and many 0s) in many cells. In addition, data were based on the reflections of individuals during, in most cases, 1 interview, rather than being extracted from institutional databases on partnerships. Individuals were not, in most cases, offered an opportunity to review or reconsider their answers at a later date. On the other hand, representatives gave their initial, unedited impressions.

This study makes a methodologic contribution by bringing clarification to the terminology of duration, status, and activities of partnerships. It would be helpful for international partnership research if authors included general characteristics about the partnerships when reporting findings in which working in partnership was required for conducting the study.

5.1 Conclusions

This study took a global view of significant international health partnerships at 4 East African universities by identifying the range of the international partners at four universities in three HPPs that helped to fulfill the tripartite mission of AHSCs. It confirms the rapid growth of interuniversity health partnerships in the last 10 years, especially with high-income countries and consortia, and also to some degree South-South partnerships. Innovative approaches within these new partnerships should be identified. As importantly, however, it shows that there is a pool of long- term partnerships at each university from which lessons can be learned.

With a majority of the partnerships not well-known among senior health representatives of the universities and confined to specific faculties, departments, or even, perhaps, individuals, it raises the question to what degree lessons and innovations are learned between partnerships and whether or when individual partnerships should work together to some degree. Universities could better publicize information about their partnerships by presenting basic information about them systematically on their websites and in their annual reports.

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Appendix 1: Phase 1 Key Informant Interview Guide

Overall Question: What in your opinion have been or are the ten most important international partnerships (any partnership outside your country) since 1991 for strengthening the medicine, nursing and/or public health programs of (name of the university)? Please answer the following questions for up to 10 partnerships.

a) What is the name of partner institution, or institutions (if it's a consortium)? Where is (are) the partner(s) located (university/institution, city and country)?

b) Who is the lead representative for the partnership? What is his/her contact information (telephone number & email)?

c) What year did the partnership start?

d) What year did the partnership end? Or, is it on-going?

e) What is (was) the duration of the partnership to date?

f) Which Schools (Medicine, Nursing, and/or Public Health) are (were) involved in the partnership?

g) What departments in each of the Schools are involved in the partnership? Please name them.

h) Who is the overall lead of the partnership for your institution?

i) Is the partnership project or program-based?

j) Who funds it? Who has funded it?

k) Does the partnership include education, research and/or service (clinical or community service) components?

l) If there is a service component is it clinical and/or community service?

m) What components (education, research and/or service) of the partnership are most significant? Rank 1, 2, 3.

n) Estimate the level of effort for each component (education, research and/or service), as a percentage (%).

o) What are the principal education, research and/or service objectives and outputs within the partnership, as applicable?

p) How valuable was/is the partnership to your College or School, as appropriate? (High, Medium, Low).

q) Please rank all the partnerships you identified in order of significance (1 to *n*) – with "1" being the most significant partnership.

Appendix 2: Data Fields for each International Partner

Focus-Name: Name of the Focus University – Moi, UoN, KCMUCo or MUHAS

Name of Institution: Name of the international partner university

City: City in which the international partner university is based.

Country*:* Country in which the international partner is based.

Years: Age of the partnership in years

Status: Whether the partnership is currently active. Binary: 1 for active; 0 for inactive.

Only-Med: Whether the partnership focused solely/primarily on activities with the Medical School. Binary: 1 for yes; 0 for no.

Only-Nur: Whether the partnership focused solely/primarily on activities with the Nursing School. Binary: 1 for yes; 0 for no.

Only-PH: Whether the partnership focused solely/primarily on activities with the Public Health School. Binary: 1 for yes; 0 for no.

Med&Nur: Whether the partnership focused solely/primarily on activities with the Medicine and Nursing Schools. Binary: 1 for yes; 0 for no.

Med&PH: Whether the partnership focused solely/primarily on activities with the Medicine and Public Health Schools. Binary: 1 for yes; 0 for no.

Nur&PH: Whether the partnership focused solely/primarily on activities with the Nursing and Public Health Schools. Binary: 1 for yes; 0 for no.

All-Progs: Whether the partnership included all three Schools. Binary: 1 for yes; 0 for no.

Only-Edu: Whether the partnership focused solely/primarily on Education activities/components. Binary: 1 for yes; 0 for no.

Only-Res: Whether the partnership focused solely/primarily on Research activities/components. Binary: 1 for yes; 0 for no.

Only-Ser: Whether the partnership focused solely/primarily on Service activities/components. Binary: 1 for yes; 0 for no.

Edu&Res: Whether the partnership focused solely/primarily on Education activities/components. Binary: 1 for yes; 0 for no.

Edu&Ser: Whether the partnership focused solely/primarily on Education and Service activities/components. Binary: 1 for yes; 0 for no.

Res&Ser: Whether the partnership focused solely/primarily on Research and Service activities/components. Binary: 1 for yes; 0 for no.

All-Comps: Whether the partnership included activities/components in Education, Research and Service. Binary: 1 for yes; 0 for no.

# of Reps 2: The number of representatives who identified the international partner as a significant partner.