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Mapping Africa's advanced public health education capacity – the AfriHealth project.

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Abstract

Literature on human resources for health in Africa has focused on personal health services. Little is known about graduate public health education. The purpose of his paper is to map 'advanced' public health education in Africa. 'Public Health' includes all professionals needed to manage and optimise health systems and the public's health.

Data was collected through questionnaires and personal visits to departments / institutes / schools of community medicine or public health. Simple descriptive statistics were used to analyse the data.

For more than 900 million people there are just under 500 full-time staff, around two-thirds of whom are male. More men (89%) than women (72%) hold senior degrees. Over half (55%) of countries do not have any post-graduate public health programme. This shortage is most severe in Lusophone and Francophone Africa. The units offering public health programmes are small: 81% has less than 20 staff and 62% less than 10. On the other hand, over 80% of Africans live in countries where at least one programme is available, and there are six larger schools with over 25 staff. Programmes are often narrowly focused on medical professionals but 'open' programmes are increasing. Public health education and research are delinked.

Africa urgently needs a plan for developing its public health education capacity. Lack of critical mass seems a key gap that can be addressed by strengthening sub-regional centres, each of which should provide programmes to surrounding countries. Research linked to public health education and to educational institutions needs to increase.

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Data availability

The database can be downloaded from www.cohred.org/AfricaSPH

Introduction

In most African countries health is in crisis. Staffing and resourcing remain serious problems in all aspects of health care [1], including in essential public health functions and health research.[2] At the same time, there is a new optimism: Africa is definitely not where it was 50 years ago.[3] Many years of capacity building have increased senior staff in spite of the continued 'brain drain', and globalisation of communication has contributed to an increasing democratisation and accountability of education and politics. Combined with attitudinal changes in donor countries and institutions [4], there is a much stronger awareness of the need to phrase answers to problems in terms of local ability rather than of foreign assistance interests although problems in 'vertical programming' remain.[5] While it is too early to judge the sustainability of these new political realities, it is time to greatly enhance system support to enable nations and regions in Africa to govern and manage their health sectors. In particular, it is high time to enable Africa to educate its own leaders in public health – those needed to execute essential public health functions, improve system performance and to form an African voice for public health in Africa.

The AfriHealth Project – rationale, history and scope

Academic education in the health sciences in Africa tends to follow the models used in the countries that colonized Africa. Medical faculties, now often changing into 'faculties of health sciences', provide training for medical and 'para-medical' staff concerned with direct patient care. On the other hand, field-level public health workers or laboratory personnel are usually trained at technical colleges or through in-service courses. Medical scientists and PhD-level researchers are educated in a few countries only, and this is usually through a combination of practice in research institutions and degree training in universities inside and outside Africa. A category of health worker not being adequately catered for is the 'public

health professional' – defined in a broad sense of those responsible for providing leadership and expert knowledge to health systems at district, provincial, national and international levels, and to 'manage the health of the public'. Graduate education in 'public is mostly done through 'departments of community health' or 'community medicine', usually located in faculties of medicine. Access to programmes was – and often still is – open to health professionals only, often only to medical doctors. From the 1970s, some departments were transformed into institutes or schools of public health. There was a brief attempt to network these emerging public health institutions to help standardize educational programming with the formation of the Network of African Public Health Institutions (NAPHI) [6] in Uganda in 1995 but this did not develop further.

At the start of the AfriHealth project in 2001, therefore, there was no vision for the development of the capacity to educate staff to 'manage health systems and public health' nor plans for educating sufficient personnel to manage and develop health systems in Africa – neither in medical / health science faculties nor in business schools nor in schools of public administration. With the exception of another Rockefeller Foundation initiative in Ghana, Uganda, Zaire and Zimbabwe ('Public Health Schools Without Walls') [7,8] little, if any, multi-disciplinary, system-oriented training in public health was available in Africa. No continent-wide assessment of high-level personnel in public health nor of academic public health capacity had been done.

Yet it was obvious that the interventions needed to deal with health problems in Africa were becoming ever more 'system intensive'.[5,9,10] There is, therefore, an increasing need for African public health professionals and for plans to educate them in sufficient numbers and with adequate competencies to provide expertise and leadership for health systems management, transformation and research. The NEPAD Health Strategy of 2003 also made

clear reference to the need for increasing the capacity for public health training in Africa [11]. In spite of this, recent key studies focussing on human resource requirements for health [1,12,13] do not elaborate on the core personnel to manage and develop health systems.

The AfriHealth set out to map 'advanced' public health education capacity *in* and *for* Africa, and to understand the role that information technology could play to enhance this capacity. Information on education *for* Africa would allow an estimation of external funding available and of the institution-building effect that scholarship support could make if more were spent *in* Africa. As it proved impossible to obtain reliable information, this paper can not report on this facet. Secondly, understanding the potential of information technology to strengthen continental capacity for public health education is essential given the dispersed nature of public health institutions. This aspect was reported elsewhere.[14] This paper, then, presents the first map of university-based public health education capacity in Africa.

Methodology

To guide the project design and implementation both an 'external' and 'local advisory group' – in South Africa – were established. The basis for data collection was a questionnaire and interview schedule dealing with course work, students, staff, facilities, funding, and information on international collaboration. A group of African experts fluent in either English, French or Portuguese was convened to administer these. Heads of all departments or schools in Africa were first contacted by telephone and e-mail, then sent the questionnaire. This was followed up by telephone and personal visits. Completed questionnaires were checked for missing items. Data was collated and analysed using Excel and simple descriptive statistics.

Data collection started in November 2001 and continued until June 2003. Provisional reporting was done then although the data was still incomplete. Completion and updating resumed in June 2006 with the help of the School of Public Health at the Makerere University in Kampala, Uganda.

Results

Table 1 provides an overview of university departments of community health and similar institutes and schools in Africa.

TABLE 1

Overall, 29/53 countries (54.7%) offer no post-graduate training in public health, 11/53 countries (20.7%) have one programme and 11/53 countries (20.7%) offer more than one programme. If the analysis is stratified by language group, major differentials appear: Anglophone sub-Sahara African countries as well as those in North Africa have more developed post-graduate public health training programmes than Francophone, Lusophone and the one Hispanic country.

TABLE 2.

It is obvious that the largest gap occurs in Lusophone countries (91% of the population lives in countries without graduate public health programmes) followed by Francophone Africa (34%).

FIGURE 1

TABLE 3

In total, there are 854 staff members working in institutions offering post-graduate public health programmes, only 493 of whom work full-time. Male staff is in the majority (63%) and this differential is enhanced if having a doctoral degree is taken into consideration (73%). Viewed in another way, 89.2% of male staff have either a Master of Doctoral qualification in contrast to only 71.6 % of female staff.

The age-distribution of staff is skewed towards younger age groups: 15% are aged 35 years or younger, 66% are aged between 36 and 50 years, and only 19% is older than 51 years of age. There is therefore a shortfall of senior staff in institutions of public health. This study did not allow an understanding of this dynamic – whether this is related to migration, illness, internal transfer to better paying externally funded positions once staff has built up a reputation, or to other causes. Finally, there are only few foreign staff members working in institutions in Africa: of the 554 staff about whom information was available, 11 (2%) were nationals from other African countries and 40 (7%) nationals from outside Africa.

Most institutional 'units' delivering post-graduate public health programmes are small, and rely on part-time staff for an important part of their establishment.

FIGURE 2

If only full-time staff is considered, over 80% of 'units' delivering post-graduate public health education have 20 staff or less, and well over 60% less than 10 staff. On the other side, there are six large institutions with 26 or more staff members: in Algeria (École Nationale de

Santé Publique), Egypt (Menoufiya University), South Africa (Universities of Cape Town and of KwaZulu-Natal), Tanzania (Muhimbili University College of Health Sciences), and Uganda (Makerere University School of Public Health).

Characteristics of post-graduate programmes

Many post-graduate public health programmes remain 'traditional' with a 'narrow view' of public health and provide access to health workers and even to medical practitioners only. This results from the fact that most graduate public health programmes emerge from 'departments of community health/medicine' which, in the Anglophone world, tend to be departments in medical schools, and therefore limit intake to medical practitioners.

Many institutions offer 'short courses' – either on their own, through research and service institutions or with and on behalf of foreign institutions and NGOs. Few of these short courses are integrated into degree programmes, creating parallel / not-integrated approach to post-graduate programmes which further taxes already scarce human resources.

Distance learning is rare, and there are few 'on job – on campus' programmes: most notably, such programmes are found in the ex-PHSWOW (Public Health Schools Without Walls) institutions (Uganda, Ghana, Zimbabwe) [3] and in Schools of Public Health in South Africa.

Few institutions have 'north-south' links and even fewer have 'south-to-south' links. The few well known African institutes and schools of public health have many links – mostly 'north – south' and mostly in joint research programmes with joint education being a less frequent reason for collaboration. For all 'units' combined, however, links with either 'northern' or 'southern' institutions are the exception rather than the rule.

Student intake at post-graduate level is over 1300 a year. (As parts of the data on student intake in Nigeria and Egypt are incomplete, the total may be somewhat higher). In particular, the number of MPH courses in Africa is rapidly rising, and with this, the number of students graduating in public health annually. There is much less growth in research degree students and courses (MSc and PhD, or equivalent).

Most programmes are directed at satisfying national needs, rather than regional or international requirements. Only three countries or five institutions specifically mentioned providing for or recruiting international students. Other institutions may accept external students incidentally but train primarily for national needs.

Linking education and research

The questionnaire did not ask specifically about research components of curricula, but it is accepted that all master and doctoral students engage in research projects to satisfy requirements for their qualification. Institutions that offer post-graduate programmes in public health generally have a very low research output,with the known exceptions of larger schools and institutions of public health. Research output is much lower than student intake even of students with research degrees. Finally, even in those institutions where there are productive 'centres of research excellence', the link between post-graduate students do not seem to be engaged in this directly.

Conclusions and Recommendations

Three limitations need to be noted. Firstly, in spite of the repetitive schedule for follow up, it was not possible to obtain comprehensive data on all countries. Secondly, this study could not measure "public health related training" in, for example, 'tropical diseases' research, medical research institutions, nursing schools, social sciences or in business schools due to lack of resources. Nevertheless, it is unlikely that this study will have missed major educational programmes in public health based on this limitation. It may have missed an individual innovative programme, however. Thirdly, 'mapping results' will inevitably be quickly outdated. Therefore, there will be errors, omissions and inaccuracies in the data presented, but, to the extent that such errors might influence the main conclusions and recommendations reached, we believe that the impact is negligible. The actual database is available from the website of the School of Health Systems and Public Health at the University of Pretoria – in a way that allows institutions to correct their data (http://afrihealth.up.ac.za/database/database.htm) or, as a spreadsheet file, from www.cohred.org/AfricaSPH .

There is a critical gap in advanced public health education in Africa: on the continent as a whole, there are 29 countries without graduate public health training and 11 countries with one institution / programme only; there are mostly small units without the critical mass needed to expand the field of public health into the multi-sectoral effort it should be; the greatest shortages occur in Lusophone and Francophone Africa, and, of course, in the one Spanish-speaking country (Equatorial Guinea). There are only 493 full-time faculty in public health for the entire continent (854 if part-time staff is included) and only 42 PhD students and 55 MSc students newly enrolled for 2005 (together, these degrees can be considered to constitute the public health research training capacity on the continent). The MPH (the

'practice of public health'), however, is growing rapidly in Anglophone and Lusophone Africa. The questionnaire did not allow comparison between programmes, and it may well be that there are substantial dissimilarities between MPH programmes. Public health research and public health education seem to be virtually completely divorced in all programmes.

As a colleague once said on reflecting on the findings of this study: "the total academic public health workforce in Africa could fit into the department of epidemiology at Johns Hopkins". While this may not be factually true, the overwhelming shortage of academic staff in public health in Africa is well expressed in this manner. While there is no clarity about an optimal number, what is clear is that less than 500 full-time academic staff distributed in small groups all over Africa is highly unlikely to be able to deliver the public health leadership needed for nearly one billion people.

At the same time, public health education in Africa is in a dynamic phase. For example, some countries in which there was no previous public health education programming are establishing national institutes of public health that combine research and education; regional collaboration in graduate programmes is becoming more frequent, as are 'south-south' collaborations, and there are more developments. The study could not systematically measure 'future developments' but the overall impression is that public health is in a revival mode in some parts of Africa and that this can be built on for the continent as a whole.

Where to from here ?

Africa needs a plan for public health human resources which has to become an explicit part of the WHO's Human Resource for Health programme, of the agenda of the Global Health Workforce Alliance, of NEPAD and of the African Union. Individual institutions both

African and external partners and ministries of health should engage by conducting relevant assessments nationally and regionally. And the 'north' , whether a partner for financial assistance or for technical support, has to make institutional capacity development a core objective. Part of preparing a plan for Africa should be an attempt to quantify the competencies and numbers of trained staff needed, so that both African and other institutions can target their educational programmes better and avoid duplications and gaps.

The effects of lack of 'critical mass' in public health in Africa is compounded by the small size of the many 'units' that offer post-graduate public health programmes: over 80% have 20 staff or less. This seems to point to two priority interventions with which to strengthen public health education: firstly, supporting existing and creating new centres in public health practice, research and education that have sufficiently large professional capability to allow multi-disciplinarity and innovation for the benefit of developing more African solutions to African public health problems. Six or eight such centres would go a long way to initiate recovery. Selection of sites for such centres could be done on the basis of language groupings, geographical distribution or on the basis of the possibility of attaching such centres to existing centres of excellence in public health research. The concept of 'centres of excellence' is sometimes seen as problematic as these could increase inequities between countries. On the other hand, the recent initiative for Leadership Initiative for Public Health in East Africa illustrates that centres of excellence can be shared and can have a wider, sub-regional influence.[15] An added benefit of larger centres of excellence may be that they are able to attract African expatriates in a way that the many small units can not. There is also a need to increase the proportion of research degree students at both master and doctoral levels[2] and larger centres offer more conducive environments for research that is both relevant and excellent.

Secondly, an investment in distance learning technology (educational as well as technical) can assist greatly in optimizing use of limited existing resources. [14]

In the short term, the accessibility to the many disciplines that need to be brought into a 'wider' public health education programme can be enhanced by increasing the flexibility of enrolment in existing programmes across faculties and universities. Academic institutions, faculties and departments can arrange course work in more 'modular' formats that allow students to take different parts of their training in different departments and universities, and even in different countries. This will enhance multi-disciplinarity of courses and encourage standardization and benchmarking of public health education. The European Credit Transfer System may offer an example of how this could be done.[16] In first instance, regional groupings, such as the East African Association of Public Health, could spearhead such arrangements at regional levels rather than attempt to do this all at once at Pan African level. This would also be in line with UNESCO's efforts to increase educational standardization and exchange between countries on the continent.[17] Easier credit transfer systems put students in more charge of their own education, increases diversity of learning, and will help in quality control through standardization and benchmarking. However, on its own, credit transfer is not sufficient and is complex to implement, and should probably be considered a medium-term goal.

For public health to grow as a discipline, increase its impact, and take on its potential role as a 'voice for health in Africa' – it is essential to internationalize training, open up to new students outside the health sector and to new academic partners so that many more sectors find a home in schools of public health for a major increase in impact. Linking public health

research to public health education is essential to increase the interaction between evidence and practice.

Support for the transformations needed in post-graduate education across the continent can be provided by an effective Association of Schools of Public Health for Africa which can serve to support standardization, accreditation, benchmarking and capacity building; it can provide 'ammunition' for directors arguing for changes in their own institutions; it can become a negotiator for good partnerships, for additional resources, and for alignment with institutional priorities; and, an effective association can become a key strategy for creating a voice for public health in Africa.

Funding for this will have to come from external sources to help boost the current positive climate in public health. Besides direct support, funding can be increased by i) conducting as much as possible of public health training in Africa so that scholarships start contributing to building African institutions; ii) programmes that prepare for 'system-intensive' interventions need to invest in health system management disciplines, epidemiology and monitoring and evaluation, and should do this in African schools of public health; iii) foundations, donors and international aid agencies interested in improving health in Africa in a sustainable manner need to seriously consider that schools of public health – taken in the widest, multi-disciplinary sense – are key in building the disciplines that are needed for sustainable health development and health equity. Fortunately, there is a growing interest in some bilateral aid agencies to support public health leadership building [15,18] and an increase in charitable funding with the entry of new foundations.[19] Hopefully, this will be followed by others.

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TABLE 1. Countries with Graduate Public Health (PH) Training Programmes

Id	Country	Institutions With Grad PH programmes	Language (region for north Africa) [1]	Population (1000's) [2]	Special comments
1	Algeria	4	N	32,854	
2	Benin	1	F	8,490	MPH awarded by Univ; regional course; multi-lingual planned; WHO supported
3	Cameroon	1	F [3]	17,795	
4	Côte d'Ivoire	1	F	18,585	Offers a 4-year Certificate d'etude speciale en sante publique; to be seen this as more than MPH; must come out of list of 'no-training'
5	Democratic Republic of Congo	2	F	58,741	
6	Egypt	13	N	72,850	All depts of CH except Alexandria. There are more than 13 institutions
7	Ethiopia	3	A	78,986	Addis Ababa, Jimma, Gonder
8	Ghana	1	A	22,535	
9	Kenya	6	A	35,599	Moi, Nairobi, Amref, TEACH; MPH in zoology in Kenyatta; Maseno: MPH; Kenya Methodist Univ: MPH
10	Malawi	1	A	13,226	
11	Morocco	4	N	30,495	
12	Mozambique	1	L	20,533	Aimed at Mozambique only; CRDS intends MPH and short courses as well – focussing on epi and health systems
13	Nigeria	11	A	141,356	
14	Rwanda	1	A [3]	9,234	MPH, USAID funded through National University of Rwanda
15	Senegal	1	F	11,770	
16	South Africa	8	A	47,939	
17	Sudan	2	N	36,900	
18	Tanzania	2	A	38,478	Kilimanjaro Christian Med Coll – MPH (private; non-profit?); Muhimbili MUSPH
19	Tunisia	6	N	10,105	
20	Uganda	1	A	28,947	Mbarara: began MPH e-learning with Lund University of Sweden in 2005
21	Zambia	1	A	11,478	
22	Zimbabwe	1	A	13,120	
Totals * population * PH programmes * Countries with PH programmes		**72** **22**		**760,016**	
Totals all countries		**56**		**922,013**	

[1] *A=Anglophone, F=Francophone,,H=Hispanic, L=Lusophone, N=north Africa*

[2] *Source:* Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat (2007). World Population Prospects: The 2006 Revision. Highlights. New York: United Nations. Accessed at http://esa.un.org/unpp/p2k0data.asp on 24-09-2007. All numbers used represent 'medium variant' estimates for 2005.

[3] Cameroon included with francophone countries; Rwanda with anglophone countries.

Notes to Table 1

Burundi: in process of establishing a National Institute of Health (joint MoH / Univ). Not contacted in the second round of survey.

Cape Verde: had health management training for Lusophone countries – may restart; in collaboration with Univ Jean Piaget, train nurses at university level. no information sought in second round of survey.

Madagascar: post graduate diploma in public health; started with MPH with WHO fellowship support; approx 30 students. No more information sought in second round of survey.

Niger: train nurses at university level jointly with Univ of KwaZulu-Natal. No information was sought in second round of survey.

DRC: The questionnaire for the first round of survey was returned for University of Kinshasa. No information on Lubumbashi.

Libya: training in medical schools: apparently 7 departments of community medicine. No information sought in second round of survey.

Mauritius: no medical school; Mauritius Institute of Health organises short course in institution with occupational health training) and offers short course in reproductive health (3 months) through the MoH.

Togo: offers university training for nurses, including in public health.

Eritrea. There is one institution, University of Asmara. In the second round, the department was being restructured and could not provide information.

TABLE 2. Distribution of public health education in Africa by language grouping

Language group	Countries without PH	Population in countries without PH (000's)	Total population in '000	% of total population in countries without PH
Anglophone Africa	11/20	30 330	471 228	6.4
Francophone Africa	18/23	106 473	221 854	48.0
Lusophone Africa	4/5	18 352	38 885	47.2
North Africa	2/7	6 358	189 562	3.4
Equatorial Guinea (Hisp)	0/1	484	484	100.0
	56		922 013	

NB: Cameroon is included with Francophone countries; Rwanda with Anglophone countries
PH = graduate public health programmes

Table 3A: Academic staff characteristics: gender and source of salary payment

	Full time			Part time			Associate		
	No of institutions	**Number of staff**	**Avg staff / institution**	**No of institutions**	**Number of staff**	**Avg staff / institution**	**No of institutions**	**Number of staff**	**Avg staff / institution**
Sex									
Male	38	298	7.8	36	157	4.4	--	--	--
Female	37	179	4.8	36	86	2.4	--	--	--
Salary									
Institution	38	414	10.9	35	126	3.6	31	129	4.2
External funds	31	79	2.5	32	52	1.6	31	54	1.7

* not all information was available for all staff listed; totals may vary.

Table 3B: Academic staff characteristics: qualifications and age distribution

	Male			Female		
	No of institutions	**Number of staff**	**Average**	**No of institutions**	**Number of staff**	**Average**
Qualifications						
Doctoral	40	236	5.9	39	86	2.2
Master	36	151	4.2	36	63	1.8
Bachelor	33	41	1.2	33	41	1.2
No Bachelor	34	6	0.2	34	18	0.5
Total		**434**			**208**	
Age distribution						
<35 years	34	44	1.3	35	40	1.1
35-50	36	261	7.3	35	113	3.2
51+	34	78	2.3	35	27	0.8
Total		**383**			**180**	

* not all information was available for all staff listed; persons may hold more than one degree

FIGURE 1

Mapping Africa's advanced public health education capacity- the AfriHealth project

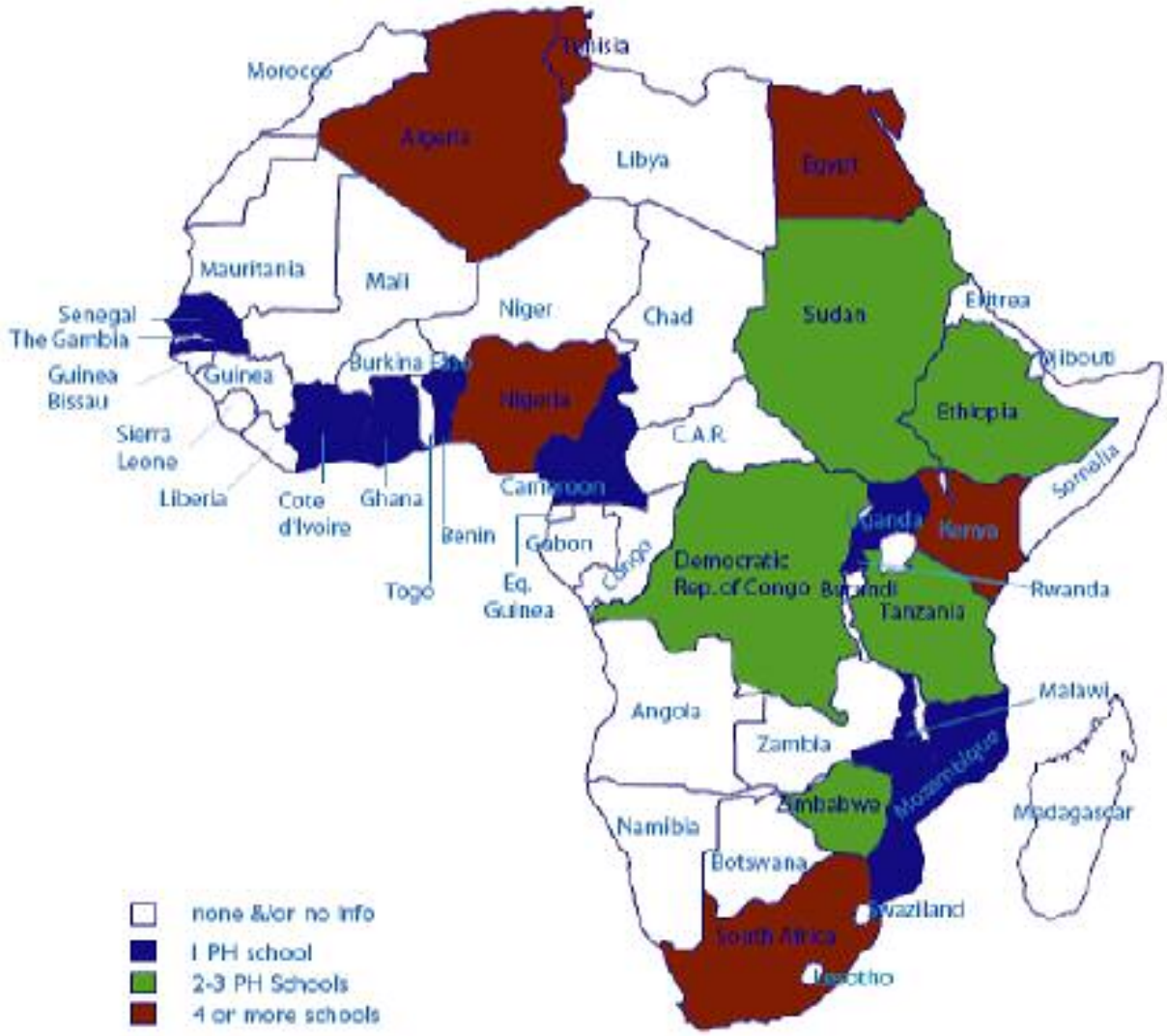

FIGURE 2

Size of departments and institutions offering graduate public health education