Training and Service in Public Health, Nigeria Field Epidemiology and Laboratory Training, 2008 – 2014

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Key words: Public health, field epidemiology, training, capacity building, Nigeria

Permanent link: http://www.panafrican-med-journal.com/content/year/18/1/2/full

DOI: 10.11694/pamj.supp.2014.18.1.4930

Received: 29/06/2014 - Accepted: 09/07/2014 - Published: 21/07/2014

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Abstract

The health workforce is one of the key building blocks for strengthening health systems. There is an alarming shortage of curative and preventive health care workers in developing countries many of which are in Africa. Africa resolutely records appalling health indices as a consequence of endemic and emerging health issues that are exacerbated by a lack of a public health workforce. In low-income countries, efforts to build public health surveillance and response systems have stalled, due in part, to the lack of epidemiologists and well-trained laboratorians. To strengthen public health systems in Africa, especially for disease surveillance and response, a number of countries have adopted a competency-based approach of training - Field Epidemiology and Laboratory Training Program (FELTP). The Nigeria FELTP was established in October 2008 as an in-service training program in field epidemiology, veterinary epidemiology and public health laboratory epidemiology and management. The first cohort of NFELTP residents began their training on 20th October 2008 and completed their training in December 2010. The program was scaled up in 2011 and it admitted 39 residents in its third cohort. The program has admitted residents in six annual cohorts since its inception admitting a total of 207 residents as of 2014 covering all the States. In addition the program has trained 395 health care workers in short courses. Since its inception, the program has responded to 133 suspected outbreaks ranging from environmental related outbreaks, vaccine preventable diseases, water and food borne, zoonoses, (including suspected viral hemorrhagic fevers) as well as neglected tropical diseases. With its emphasis on one health approach of solving public health issues the program has recruited physicians, veterinarians and laboratorians to work jointly on human, animal and environmental health issues. Residents have worked to identify risk factors of disease at the human animal interface for influenza, brucellosis, tick-borne relapsing fever, rabies, leptospirosis and zoonotic helminthic infections. The program has been involved in polio eradication efforts through its National Stop Transmission of Polio (NSTOP). The commencement of NFELTP was a novel approach to building sustainable epidemiological capacity to strengthen public health systems especially surveillance and response systems in Nigeria. Training and capacity building efforts should be tied to specific system strengthening and not viewed as an end to them. The approach of linking training and service provision may be an innovative approach towards addressing the numerous health challenges.

Introduction

The health workforce is one of the key building blocks for strengthening health systems[1]. There is an alarming shortage of curative and preventive health care workers in developing countries many of which are in Africa. The continent has an estimated 2.3 health care workers per 1000 population, compared with the Americas, where there are 24.8 health care workers per 1000 population[2]. Africa resolutely records appalling health indices as a consequence of endemic and emerging health issues that are exacerbated by a lack of a public health workforce. In low-income countries, efforts to build public health surveillance and response systems have stalled, due in part, to the lack of epidemiologists and well-trained laboratorians[3]. Weak surveillance systems coupled with untimely and uncoordinated response to disease outbreaks have continued to be a challenge in many African countries. Emerging pandemic threats require development of worldwide capacity for public health surveillance and response especially given the increased travel and urbanization. Good international public health surveillance and response, which is the basis of International Health Regulations (IHR) of 2005, cannot exist sustainably without good domestic surveillance and response operated by competent public health workers in core public health positions at national and sub-national levels with a focus on disease prevention. To achieve this, there is need to address several interrelated factors on human resources, disease surveillance and
reporting capacity in an integrated and sustainable approach that enables the development of public health workforce capacity in order to achieve public health surveillance and response systems that have a sustainable and adaptable capacity to address evolving public health needs (4).

To strengthen public health systems in Africa, especially for disease surveillance and response, a number of countries have adopted a competency-based approach of training modelled after the >60 year old United States (U.S.) Centers for Disease Control (CDC)’s Epidemiologic Intelligence Service (EIS) program. EIS has been responsible for developing the U.S. public health surveillance and response systems at the Federal and State levels. In the 1980s, CDC formed a partnership with the World Health Organization (WHO) to establish the Field Epidemiology Training Programs (FETPs). These training programs (and their allied programs such as Public Health Schools Without Walls) have shown to be a successful way to strengthen public health systems by providing a critical component of the public health workforce that is needed to operate public health surveillance and response systems to implement IHR (2005). Residents and staff of these programs provide services such as applied epidemiology, outbreak investigations, and surveillance evaluations to a country’s Ministry of Health (MOH) while building competency in applied epidemiology. Increasingly, FETPs have incorporated other specialties including laboratory and management expertise. The first FETP to add a laboratory component was the Kenya Field Epidemiology and Laboratory Training Program (FELTP). Since majority of the emerging threats are of zoonotic origin necessitating a human animal collaboration, newer programs have incorporated a veterinary component to address animal health issues necessary for meaningful collaborations between the animal and human health sectors. It is estimated that the need for veterinary epidemiologists is about 250 graduates of FETPs/FELTPs per one million inhabitants in a country(4-11).

Many countries have adopted a tiered approach of training with the 2-year training of FETP being at the apex and aimed at developing public health leaders. This is augmented with competency-based short courses to build necessary epidemiological capacity among the frontline surveillance and response staff at lower levels of the health system[12]. Nigeria with a population of over 170 million people in 36 states and 77 Local Government Areas (LGAs) suffers from several recurrent disease outbreaks including cholera, yellow fever, meningococcal disease, and zoonotic diseases such as lassa fever[13-20]. The existing surveillance systems (animal and human) are weak[10, 21]. The Federal Ministry of Health (FMoH) is still rolling out the WHO African Regional Office Integrated Disease Surveillance and Response (IDSR) strategy a platform tailored to meet the surveillance needs of Sub-Saharan Africa[22]. IDSR progress has been hindered by inadequate qualified personnel to operate the system[23]. The animal health sector surveillance system is operated under the National Animal Disease Information System (NADIS). NADIS has an urgent need for additional epidemiologists and laboratorians to ensure rapid detection and control of zoonotic and other animal human interface issues such as food safety, environmental health and collaborative one health activities. The ever-present threat of zoonoses in Nigeria is real given the experiences of H5N1, avian influenza, and ebola virus disease. Nigeria presented an opportunity to strengthen collaboration between the animal and human health sectors to address the diseases at human animal interface. There is need to build the surveillance capacity for both human and animal health sectors given the few trained epidemiologists in the systems to recommended international levels(4).

Nigeria FELTP description

In January 2007, CDC initiated negotiations with the Federal Ministry of Health (FMoH) to implement a 2-year FELTP. Three outbreak investigation short courses lasting two weeks were conducted between June and July 2007. The 2 year FETP program was implemented in October 2008 as an in-service training program in field epidemiology, veterinary epidemiology and public health laboratory epidemiology in collaboration with the MOH. This long-term initiative within the FMoH and Federal Ministry of Agriculture and Rural Development (FMARD), aimed at training medical epidemiologists, veterinary epidemiologists and public health laboratory scientists for leadership positions in various levels of both ministries. While in training, the trainees (who are called residents) provide service as may be required to the FMoH, FMARD and respective State Ministries of Health (SMoH) and State Ministries of Agriculture and Rural Development through short and long-term field placements and surveillance and response systems. Like FETPs and FELTPs, NFELTP is composed of a 29% didactic component and a 71% field based component. The course lasts 24 months and is offered in collaboration with two leading Nigerian universities- University of Ibadan (UI) in the southwest region and Ahmadu Bello University (ABU) in the northwest region. The first cohort of NFELTP residents began their training on 26th October 2008 and completed their graduation training on 26th October 2010. The program was scaled up in 2011 and it admitted 39 residents in its third cohort. The program has admitted residents in its third cohort since its inception admitting a total of 207 residents as of 2014. The target of the program is to have at least one graduate from NFELTP per 200,000 population operating a multi-disease surveillance system[24]. In addition to the degree awarding 2-year masters course, NFELTP also offers a series of short courses meant to strengthen the epidemiological capacity of various public health practitioners at the Federal, State and Local Government Areas (LGA) levels. The Program has a broad base of implementing partners, who include the FMoH, FMARD, UI, UI, CDC and African Field Epidemiology Network (AFNET). All these organizations are represented in a multi-agency Steering Committee that is headed by the FMoH-based Program Director: The Steering Committee meets bi-annually to guide the implementation of the program, evaluate its progress and mobilize resources for the program.

1. Vision, Mission and Goal and Multi-year Objectives of the program [24]

Vision : NFELTP seeks to become a world class FELTP producing public health leaders and practitioners that can strengthen and lead public health systems to prevent and reduce morbidity and mortality from priority diseases in Nigeria.

Mission : NFELTP exists to develop, implement, and strengthen an effective public health workforce to operate multi-disease surveillance systems and surveillance and response system that is operational in all States and LGAs in Nigeria by 2025. Multi-year objectives: Implement a tiered public health workforce development plan Strengthen IDSR at all levels (Federal, State, LGA, community) Conduct and disseminate public health operations research on priority topics; Develop and implement a sustainability plan and support NFELTP operations.

2. Course content and field work

Like other FETPs/FELTPs, the Nigeria 2-year program consists of formal instruction and service activities. The program supports competencies in four key scientific domains: epidemiology, public health surveillance, biostatistics, and scientific communication. Other minor domains include veterinary epidemiology, preventive effectiveness, leadership and management, teaching and mentoring as well as laboratory skills. These courses are covered in four clusters of training each lasting about 4 to 6 weeks. There are cluster exams at the end of each cluster of training. After completing the course, the resident has to complete and defend a protocol-based dissertation. The didactic sessions are augmented by quarterly academic seminars. The didactic sessions integrate laboratory epidemiological, veterinary epidemiology, veterinary epidemiology and laboratory epidemiology and other domains. The distinction between the residents and the trainees is their course content, field posting assignments, degrees awarded as well as potential deployment post-training.

In 2008, the program recruited 13 residents (6 physicians, 4 veterinarians and 3 laboratory personnel). In 2011, the program in response to demand from residents and graduates, scaled up and recruited a third cohort. The annual recruitment has remained between 40 and 53 with variations from 3-6 months. For the 2 year long course the program has recruited a cohort of residents annually since its inception in 2008. The first three cohorts have successfully completed the 2-year course. For equitable distribution of skilled public health workers the program has assured recruitment from all regions and states of the country. Of the 207 residents admitted (53%) are medical doctors, 34 (26%) are laboratory scientists and 33(16%) are veterinarians. The target of the program is to train 5 epidemiologists per million populations in Nigeria. In the six years of implementation the program has achieved 27% of its target (range of 36% in North Central to 18% in South South region) (Table 1).

<table>
<thead>
<tr>
<th>Zone</th>
<th>Number admitted</th>
<th>Per 1 million population</th>
<th>% Coverage*</th>
</tr>
</thead>
<tbody>
<tr>
<td>North East</td>
<td>35</td>
<td>1.35</td>
<td>35%</td>
</tr>
<tr>
<td>South-East</td>
<td>32</td>
<td>1.78</td>
<td>25%</td>
</tr>
<tr>
<td>North West</td>
<td>36</td>
<td>1.21</td>
<td>35%</td>
</tr>
<tr>
<td>South South</td>
<td>33</td>
<td>1.34</td>
<td>33%</td>
</tr>
<tr>
<td>Total</td>
<td>207</td>
<td>1.34</td>
<td>27%</td>
</tr>
</tbody>
</table>

Overall 133 suspected outbreaks have been responded to ranging from lead poisoning outbreak in Zamfara state, cholera outbreak, cerebral malaria meningitis, Lassa fever and acute renal failure in children as a result of consumption of a contaminated “garri”-based meatball mixture. Other outbreaks investigated include measles, rabies and Leptospirosis. Overall 123 suspected outbreaks have been responded to ranging from environmental related outbreaks, vaccine preventable diseases, water and food borne, zoonoses, (including suspected viral hemorrhagic fever) as well as neglected tropical diseases. Some of these outbreaks are described in published articles[14-16,18,25] (Figure 2).

Each of the states has at least one resident recruited in the program with an average recruitment per state of 5.6 (range of 1-9) (Figure 1).

Progress of the program (2008 – 2014)

Workforce development: This has been achieved through the tiered approach of long course (2 years degree course) and short courses that range from 3-6 months. For the 2 year long course the program has recruited a cohort of residents annually since its inception in 2008. The first three cohorts have successfully completed the 2-year course. For equitable distribution of skilled public health workers the program has guaranteed recruitment from all regions and states of the country. Of the 207 residents admitted (53%) are medical doctors, 34 (26%) are laboratory scientists and 33 (16%) are veterinarians. The target of the program is to train 5 epidemiologists per million populations in Nigeria. In the six years of implementation the program has achieved 27% of its target (range of 36% in North Central to 18% in South South region) (Table 1).

One health, emerging infectious diseases : With its emphasis on one health approach of issues in public health systems, the program recruited physicians, veterinarians and laboratory workers to work jointly on human and animal health diseases. Training in disciplinary epidemiology and surveillance with emphasis on vaccine preventable diseases and surveillance with emphasis on vaccinepreventable diseases, influenza, tuberculosis, tick-borne relapsing fever, rabies, Leptospirosis, malaria, dengue and other arbovirus diseases are offered. Short courses for multi-disciplinary teams the program has been involved in improving data analysis, surveillance systems and risk factors for loading zoonoses in Nigeria. The program worked with CDC recently identify potential for emerging infectious diseases in a traditional ceremony that involves bats with nets (Figure 3).

3. Program evaluation and surveillance : The residents have supported scale up of IDSR capacity at the federal and state levels through various programs and initiatives. The program is building a public health workforce to operate multi-disease surveillance systems at all levels of administration. Residents help analyze surveillance data, respond to outbreaks, investigate deaths, and data disentangle. The program is creating and working with the decision makers with evidence for program implementation a number of residents have looked at hospital based mortality to identify risk factors of disease at the human animal interface for influenza, brucellosis, tick-borne relapsing fever, rabies, Leptospirosis, malaria, dengue and other arbovirus diseases.

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The residents have participated in the National Health Setting priority research agenda: An in effort to support evidence-based public health decision making, the program has worked with the Nigeria Federal Ministry of Health (FMoH) to identify research priorities. Operational research workshops have been held to identify gaps in existing health data and policy. Some residents are working on non-communicable disease including hypertension, obesity and cancer. A resident assessed cervical cancer screening programs. Residents have demonstrated increased efficiencies by use of standardized methods in disease control efforts including HIV to support program evaluation and response strategy implementation in selected Local Government Areas of Kaduna state. Annals of Nigerian Medicine. 2013; 7 (1) : 12.


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