PanAfrican Medical Journal

Supplement article

Open Access

Research

Strengthening field epidemiology in Africa: The Zimbabwe Field Epidemiology Training Program

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Key words: Epidemiology, education, training, public health, Zimbabwe, MPH program

Received: 31/08/2011 - Accepted: 07/12/2011 - Published: 15/12/2011

This article is published as part of the supplement "Field Epidemiology in Africa". Supplement sponsored by PAMJ and The African Field Epidemiology Network

Abstract

The Zimbabwe Masters in Public Health Program is a 2-year competency based training that consists of classroom teaching (30%) and on the job field training (70%). The MPH program was created in 1993 with the aim of assisting the Ministry of Health and Child Welfare create a permanent capacity to recruit, train, and employ public health practitioners to sustain the public health infrastructure. The MPH program is operated from two sites: the DCM at the College of Health Sciences, of University of Zimbabwe (UZ) and the Health Studies Office (HSO) in MOHCW. The HSO in the MOHCW oversees the operation of field training in collaboration with approved Field Supervisors at the training sites. MOHCW provides field training sites through its eight provincial medical directorates. In addition the health directorates of the major cities in the country are designated field training sites. Since 1993, the program has had 18 Cohorts trained of which three are part-time. The part-time program was initiated in 2008 with an intake of 10 trainees. Since 2003, the full time program has experienced an increase in intake with the highest intake recorded being 16 trainees in 2003. The average intake from 2003 - 2011 has been 12 trainees. A total of 169 trainees have been enrolled in the last 19 years. Of the 143 trainees enrolled by 2009, 136 (95%) have graduated. The part-time program has had one cohort graduating with 5 out 10 successfully completing the course. Since the launch of the program, the majority of the graduates have filled most of the key public health positions and even so the positions in most of the nongovernmental organisations.

Pan African Medical Journal. 2011; 10(Supp1):12

This article is available online at: http://www.panafrican-med-journal.com/content/series/10/1/12/full/

Background

Up until 1992, Zimbabwe faced an acute need for post-graduate level public health training. Most public health posts were filled temporarily by expatriate doctors, mainly Dutch public health specialists under a government to government agreement. In addition, Zimbabwean physicians who did serve in public health posts but went overseas for public health training, frequently found themselves ill-equipped to function in local public health settings on return [1]. In response to these training needs, the Ministry of Health and Child Welfare (MOHCW) in partnership with the University of Zimbabwe (UZ), Department of Community Medicine (DCM) and with funding from the Rockefeller Foundation (www.rockfound.org) started a Master of Public Health (MPH) program using the Public Health Schools Without Walls (PHSWOW) strategy [1,2]. The first PHSWOW in Africa was founded in Zimbabwe in 1993 with four trainees. The goal of the MPH project was to produce highly competent multi-disciplinary public health professionals who would assume influential posts in the country's public health structures and tackle emerging and re-emerging communicable and non-communicable diseases [1,3].

Currently the combination of an economic recession, drought, and an HIV epidemic has worsened the disease burden and worsened most public health indicators in Zimbabwe. The MPH program thus aims at assisting the MOHCW to create a permanent capacity to recruit, train, and employ public health practitioners to sustain the public health infrastructure. To accomplish this, an integrated programme of formal class work and a large element of supervised practice in actual public health settings was developed [1].

Approaches and methods

The MPH program is a 2-year competency based training that consists of classroom teaching (30%) and on the job field training (70%). It is managed through an Advisory Committee chaired by the Principal Director in the MOHCW. The Advisory Committee provides overall stewardship of the programme. Program staff consists of an MPH Coordinator/Director who has an academic post in the DCM, two assistant field coordinators, a financial administrator, two program secretaries and a driver. The program collaborates with the Division of Public Health Systems and Workforce Development (DPHSWD) at the United States Centers for Disease Control and Prevention (CDC), Training Programs in Epidemiology and Public Health Interventions Network (TEPHINET), African Field Epidemiology Network (AFENET), World Health Organisation (WHO), Zimbabwe CDC, and informally with United Nations Children's Fund (UNICEF), United Nations Development Programme (UNDP) and United Nations Population Fund (UNFPA).

In 2008, a part-time MPH program was launched due to the demand of the program. The part-time program is a three year program that uses the modular approach where trainees come for classes over a short period of time and go back to their work places that act as field sites for field work.

The MPH program is operated from two sites: the DCM at the College of Health Sciences, of University of Zimbabwe (UZ) and the Health Studies Office (HSO) in MOHCW.

The HSO in the MOHCW oversees the administration of field training in collaboration with field supervisors at the training sites. MOHCW provides field training sites through its eight provincial medical directorates. In addition, the health directorates of the two major cities (i.e., Harare and Bulawayo) in the country are designated field training sites. A number of additional sites have been identified and are operational and currently 15 sites are used for training. These include parastatals such as the National AIDS Council and Zimbabwe Family Planning Council, AIDS and TB unit within the MOHCW, private organizations such as Bindura Nickel Corporation and Organization for Public Health Interventions and Development. Currently, there are 30 active field supervisors for both full-time and part-time trainees. Most of the field supervisors are graduates of the programme and hold the influential positions in the MOHCW. The program continues to explore additional non-traditional field sites among AIDS service organizations, UN agencies and non-governmental organizations for both full-time and part-time trainees.

DCM provides the 6 month didactic component of the programme. The MPH coordinator oversees the organization of the modules and field experience. The classroom lectures are front loaded for the initial 6 months followed by 18 months of continuous field attachment.

The classroom (academic) component is organized into six academic modules (**Table 1**). Each module is coordinated by a module coordinator. Some field supervisors also lecture in the program during the didactic sessions. The DCM has two professors who are part of the program. The program receives guest lecturers from other partners such as WHO, Elizabeth Glaser Paediatric AIDS Foundation, MOHCW, CDC, and others. Besides the field coordinators, there is also a pool of highly qualified academic staff within the department of community medicine within which this program falls. **Table 1** lists the modules by block.

In summary, the 2-year course schedule is organized into two alternating academic and field blocks as shown in **Table 2**. Trainees are required to take and pass regularly scheduled tests before they start their field attachments. A final examination for each of the academic courses is taken at the end of the second year of the program. In addition, trainees have a thesis project developed based on one of the field investigations undertaken during the field attachment. This is usually as an extension of one of the field write-up requirements. The MPH thesis requirement is intended to demonstrate the student´s ability to independently identify, analyze and solve problems in the field. The thesis contributes 25% of the final course grade.

The field component is achieved through six core activities which are supervised and mentored by field supervisors and field coordinators. These are as follows: Outbreak investigation; Surveillance system evaluation; Management and health economics analysis; Program evaluation; Secondary data analysis; Field study

The MOHSW offers training facilities in terms of field sites as well as some material resources. At each field site the trainees are being supervised by Provincial Medical Directors and by Directors of Health for those in cities. These directors are graduates of the FETP program. This has helped in sustaining the program.

UZ awards the degree of MPH upon successful completion of program requirements.

Special short courses

While in the field, trainees attend two courses: 1) Course in scientific writing. This is a 5 day course designed to impart communication and writing skills to trainees. This prepares trainees for writing of manuscripts for publications and making scientific presentations. In addition they learn how to critique a scientific paper; 2) Advanced data analysis to prepare trainees for fieldwork. The course normally runs for least two days. A CDC manual on advanced data analysis titled "Sexually Transmitted Infections in Kuwadzana" which was developed based on a study conducted by a Zimbabwe FETP student, is used for this purpose, this case study is used globally by other FETPs and FELTPs. During this course trainees learn how to analyze a dataset starting with the cleaning, performing some logic checks, checking for duplicate records, checking for outliers and the actual analysis itself including univariate, bivariate and multivariate analysis and finally the interpretation of the different statistical outputs.

Field support to trainees

Trainees are expected to attend a mandatory monthly conference where they present their field projects and progress. The conference is held every last Friday of the month and is held at the MOHCW headquarters. It is attended by the trainees, field coordinators, field supervisors, faculty, CDC staff, the permanent Secretary of Health, the chairman of the MPH Advisory Committee, Chairman of DCM and other invited guests. It provides a forum for trainees to present results of evaluations done and get a feedback from their peers and from MOHCW officials.

In addition to these monthly conferences, trainees receive quarterly assessments by program coordinators to coach and ensure that trainees are on-course as far as field assignments are concerned.

Results

Since 1993, the program has had 18 cohorts trained of which three are part-time (**Table 3**). The part-time program was initiated in 2008 with an intake of 10 trainees. Since 2003, the full time program has experienced an increase in the intake with the highest intake recorded being 16 trainees in 2003. The average intake from 2003 – 2011 has been 12 trainees. A total of 169 trainees have been enrolled in the last 19 years. Of the 143 trainees enrolled by 2009, 141 (99%) have graduated. The part-time program has had one cohort graduating with five out of 10 trainees successfully completing the course.

Table 4 shows some of the employment positions that graduates of the program are holding in the public health sector. By 2011, the three most senior positions in the MOHCW – the Permanent Secretary for Health, Principal Director Preventive Health, and Director of Disease Control and Prevention were held by graduates of the program. The MPH program has two Field Coordinators who are also graduates of the program. The majority of the graduates have filled the positions in the non-governmental organisations.

Since the program was launched, a number of key contributions have been documented that relate to strengthening the public health system in Zimbabwe. **Table 5** shows the contributions in terms of outbreak investigations, surveillance and program evaluations, among others. A total of 14 outbreak investigations, surveillance system and program evaluations have been conducted for each. Thirty four publications have been made in peer review journals.

IDSR/IHR progress in Zimbabwe and how the program has helped

In September 1998, the 48th Regional Committee for Africa met in Harare, Zimbabwe. Through the resolution AFRO/RC48/R2, Member states adopted the Integrated Disease Surveillance and Response (IDSR) strategy as a regional strategy for early detection and efficacious response to priority communicable diseases for the African region [4].

Zimbabwe carried out an assessment of its surveillance system in 1999 and identified areas where improvements were needed. The assessment contributed to the development of the 2002 Zimbabwe IDSR guidelines which were adapted from the WHO 2000 generic IDSR guidelines. Following the assessment an inter-country workshop was held from the 30th of October 2001 to 7th November 2001 to adapt the generic IDSR technical guidelines to the Zimbabwe context. This was followed by another workshop from the 19th to the 24th of August 2002 which sought to adapt modules 1, 2,3,4,5 and 7.

In December 2002 and January 2003 two training of trainers workshops were conducted for the northern, southern provinces, central hospitals and MOHCW head office staff. Public health workers from districts, provinces and cities were subsequently trained in IDSR. About 400 public health workers were trained during this first adaptation. Further adaptation of training modules was done in December 2004 to suit health centre level staff who was then trained from 2005 onwards. In addition uniformed forces health personnel were also trained in 2007.

The Zimbabwe FETP led the adaptation process of the IDSR guidelines and has also been actively involved in training of public health workers. IDSR is also included in the MPH curriculum. Trainees carry out surveillance evaluations as one of their core activities for learning and to date 143 evaluations have been conducted and recommendations from these evaluations have helped in shaping health policy within the country. On 23 May 2005, the 58th World Health Assembly adopted the International Health Regulations (IHR, 2005) in Geneva, Switzerland through Resolution

WHA58.3. The International Health Regulations entered into force on June 15, 2007. In the WHO/AFRO member states it was agreed that the IHR be implemented through IDSR strategy. Based on this, the MOHSW and its partners including WHO and Zimbabwe FETP have had a series of adaptation meetings including revision of modules. There has been training of trainers workshops and subsequently training of the health cadres at all levels.

A number of milestones with regards to implementation of IDSR have been achieved in Zimbabwe. One of the major achievements to note is that in 2004 after the first adaptation, MOHCW won the South African Development Community trophy for having the best surveillance system in the region [5].

Discussion

The PHSWOW (FETP) is experiencing increased demand throughout the world as the need and expectation for high quality public health services continues to grow. Public health services in many countries, however, are experiencing these greater demands even as resources for public health are diminishing [6]. In Zimbabwe, the demand for enrolment for the MPH program has remained high over the past 10 years. This has been characterised by huge numbers of applications and requests by organisations and institutions to have provisions for those who would want to remain in full employment while studying. As a result, in 2008, the program began a 3-year part-time MPH program in order to meet this demand.

The success of the Zimbabwe MPH program has largely been due to the close collaboration and support from the MOHCW. This support comes in form of office space, funds, stationery, transport and other logistics. Most of the site supervisors are graduates of the program and understands the program structure, field expectations and needs. Zimbabwe still enjoys the presence of these graduates in these positions as reflected in the study conducted in 2010. This review of retention for the MPH cohorts has shown that for Zimbabwe (1993-1997 enrolments), the retention within country was high within the MOHCW (47%) and graduates have these positions at provincial level which are field sites [7]. To maintain this support, the Zimbabwe program has revived the Alumni association and holds yearly meetings with site supervisors to review and re-engage them in the life of the program.

The main achievement of the program is in line with its vision, in that it has managed to produce cadres that now occupy very influential positions within the public health system in the country. The graduates of the program have found employment in a number of sectors including Ministry of Health and Non Governmental Organisations (NGOs). The MPH program has continued to exploit other sources for funding in order to sustain itself, and expand the public health capacity in Zimbabwe. In 2001-2006 the programme used new HIV/AIDS programme-specific funds to strengthen and expand the general public health leadership capacity in Zimbabwe, simultaneously ensuring that they were trained in HIV interventions. As a result, there was an increase in both the numbers of public health professionals practically trained HIV /AIDS programmes and also HIV / AIDS related positions filled in the MOHCW and other partner organisations [8].

The program has continued to play a critical role in the strengthening of the public health system (i.e., in planning and implementation of the local and national health programs). This has been achieved through the program coordinators and the trainees as they do field activities at the field sites. The trainees under the guidance of the field supervisors and coordinators conduct and respond to outbreaks, evaluate surveillance systems, conduct field studies, carry out program evaluation, carry out secondary data analysis and perform some management and health economics analysis [7].

Findings from various evaluations that have been conducted by the trainees have helped in shaping the Zimbabwean public health policies on several issues including malaria diagnosis, HIV management, communicable disease control (e.g., cholera), prevention of mother to child transmission of HIV program, drug stock management, and surveillance systems.

The MPH program, because of its years of experience, has become a centre of excellence for other young Field Epidemiology and Laboratory (FELTP) programs. In 2009 - 2010 delegations from Ethiopia, Nigeria, and Kenya FELTP programs came to learn and understand how the program runs especially given its unique collaboration between the MOHCW and UZ. Graduates of the program have participated in scientific conferences in country and outside the country.

The program has participated in response to regional public health threats as shown during the 2008-9 cholera outbreaks that affected both Zimbabwe and South Africa.

The Zimbabwe FETP is one of the founding member countries of AFENET. AFENET offers technical expertise to the programme as well as funding and material resources (e.g., for outbreak response). CDC is another key partner to the program. CDC has continued to provide funding and technical support to the program.

Future plans of the FETP

The following are the future plans for the Zimbabwe FETP: 1) Identifying new field training sites; 2) Seek for alternative funding sources; 3) Maintain the traditional field sites and the team of dedicated field supervisors; 4) Continue training foreign students.

Sustainability of the program

The program is involved in designing a strategic plan which will include engaging the MOHSW to try and come up with a budget line item to cover the costs for the program. In addition to this, the program has begun recovering certain costs from the trainees through requesting trainees to pay

for their training materials and supplies. The program has continued to engage and encourage all graduates, through the Alumni association, to be involved in the activities of the program to ensure availability of personnel to teach and mentor trainees.

Limitations

The program has faced a number of challenges and limitations over the recent years.

1. The increase in the intake of residents from 13 to 30 has not been matched with an increase in the number of field coordinators in the program as well as field supervisors at the field sites. This has resulted in increased workload for the few faculty members that are available.

2. Attrition of field supervisors. Because of recent economic challenges in the country, a number of qualified people have moved to partner organisations and outside the country.

3. The part-time program has managed to graduate only five from the 2008 cohort out of the possible 10. This is because the field supervision is difficult when trainee and supervisor work in different institutions, which is usually the case for part time program. Students from non-governmental sector tend to struggle and some are likely to drop out due to their work overload and the resulting inadequate time for studies.

Conclusion

The program has continued in its commitment to produce competent and skilled graduates who are ready to assume leadership positions in the MOHCW. Over the years, this has translated into improved response to and containment of outbreaks and health systems strengthening. During training, trainees contributed in the controlling and investigating outbreaks and evaluations of public health systems and programs. Therefore, there is greater need for continued support from government and development partners to ensure program sustainability. The close collaboration between the MOHCW and UZ has enhanced the efforts to realising the mission of the program.

Authors' contributions

Mufuta Tshimanga: Contributed to writing drafts of the article, reviewed several drafts, provided important intellectual content, and approval of the version to be published. Notion Gombe: Contributed to writing drafts of the article, reviewed several drafts, provided important intellectual content Gerald Shambira: Contributed to writing drafts of the article, reviewed several drafts, and provided important intellectual content. Ndlovu Nqobile: Contributed to development and design of the concept, writing the article and providing important intellectual content.

Acknowledgments

The Zimbabwe MPH program would like to acknowledge the many people and organizations that provide support and funding to the program, specifically the CDC, WHO, faculty members from the UZ, MOHCW and AFENET. Special acknowledgement is made to Dr Peter Nsubuga for his guidance in writing this paper.

Competing interests

All the authors are affiliated with the Zimbabwe FETP. No other competing interests declared.

Tables

Table 1: Zimbabwe Field Epidemiology Training Program modules

Table 2: Zimbabwe Field Epidemiology Training Program academic and field blocks

Table 3: Zimbabwe Field Epidemiology Training Program graduates and trainees, 1993 - 2011

Table 4: Key positions held by Zimbabwe Field Epidemiology Training Program graduates in the public health sector

Table 5: Zimbabwe Field Epidemiology Training Program contribution to the public health system

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Table 1: Zimbabwe Field Epidemiology Training Program modules

Block 1	Mod. 1.1 Public Health Philosophy
	Mod. 1.2 Epidemiology and Field Research
	Mod. 1.3 Biostatistics & Statistical Computing
	Mod. 1.4 Health Systems Research
Block 2	Mod. 2.1Health promotion;
	Mod. 2.2 Communication skills
Block 3	Mod. 3.1 Communicable & Non-Communicable Diseases
	Mod. 3.2 HIV/AIDS
Block 4	Mod. 4.1 Epidemiology II
	Mod. 4.2 Health Services Management
Block 5	Mod. 5.1 Maternal and Child Health & Family Planning
	Mod. 5.2 Advanced Biostatistics
Block 6	Mod. 6.1 Environmental and Occupational Health

Table 2: Zimbabwe Field Epidemiology Training Program academic and field Blocks

Months	**Number of months**	**Training description/Location**
$1^{st} – 6^{th}$	6	Classroom training (except for short field trips amounting to a month)
$7^{th} – 21^{st}$	15	Supervised field activities
$22^{nd} – 24^{th}$	3	Classroom training (trainees attend revision classes, finalize reports including theses, and take final exams)

Table 3: Zimbabwe Field Epidemiology Training Program graduates and trainees, 1993 - 2011				
Year	**Number enrolled**		**Number graduated**	
	Full time	**Part-time**	**Full time**	**Part-time**
1993	4		4	
1994	4		4	
1995	5		5	
1996	7		7	
1997	6		6	
1998	6		6	
1999	8		8	
2000	5		5	
2001	7		7	
2002	9		9	
2003	16		15	
2004	10		9	
2005	13		11	
2006	8		8	
2007	12		11	
2008	12	10	12	5
2009	11	7	9	Still to graduate
2010	14	0	Still to graduate	No intake
2011	12	7	Still to graduate	Still to graduate
Total	**169**	**24**	**136**	**5**

Table 4: Key positions held by Zimbabwe Field Epidemiology Training Program graduates in the public health sector		
Sector	**Positions held (as of 2011)**	**Number**
Government National	1. Permanent Secretary for Health	1
	2. Principal Director Preventive Health	1
	3. Directors (Epi and Disease control, ZNFPC, FELTP)	3
	4. National Malaria Program Manager	1
	5. Malaria Case Management Focal Person	1
	6. Laboratory Surveillance Officer	1
Provincial Universities	7. National ART Program Coordinator	1
	8. Director – City Health Department	4
	9. Provincial Medical Directors	3
	10. Provincial Epidemiology and Disease control Officers	3
	11. Lecturers/Field Coordinators	3
NGO/UN/CDC	12. Medical Epidemiologist (SAFELTP)	1
	13. National Professional Officers (WHO)	3
	14. Program Managers (Malaria, TB, HIV, Nutrition)	10
	15. Operations Research Officer	1
	16. M&E Specialists	4
	17. PMTCT Technical Officer	2
	18. Country Director (EGPAF)	1
	19. Deputy Director – Zim CDC	1
	20. Chief Executive Officer - NAC	1
	21. Laboratory Project Coordinator (AFENET)	1
Self employed	22. Public Health Consultants	1

Table 5: Zimbabwe Field Epidemiology Training Program contribution to the public health system	
Achievements	**Number**
Outbreaks investigations and response	141
Surveillance data publication	52
Surveillance systems evaluated	141
Research studies done	141
Evaluations (Program or Project)	141
Scientific presentations at conferences	328
Publications by the trainees	34
Short courses and proportion of cadres trained	14 (154 cadres trained)