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TRAINING NEEDS FOR MID-LEVEL MANAGERS AND IMMUNISATION COVERAGE IN WESTERN KENYA
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S.O. AYAYA, E. LIECHTY, J.H. CONWAY, T. KAMAU and F.O. ESAMAI

ABSTRACT

Objectives: **To determine the current status of immunisation coverage in Western Kenya before intervention, to identify strengths and weaknesses of the existing programme in order to design educational interventions that could improve the services provided and find out the training needs of the mid-level managers of Kenya Expanded Programme of Immunisation.**

Design: **Cross-sectional descriptive study.**

Setting: **All thirty nine districts in Rift Valley, Western and Nyanza provinces.**

Subjects: **Mid-level managers of Kenya Expanded Programme on Immunisation in the 39 districts and the provinces. These included Provincial Logisticians, Provincial Medical Officers of Health, District Medical Officers of Health, District Public Health Nurses, District Records and Health Information Officers, District Disease Surveillance Officers, and District Public Health Officers.**

Main outcome measures: **Number of staff trained on EPI, coverage rates and perceived training needs of the mid-level managers.**

Results: **A total of eighty eight mid-level managers participated in the interviews. Most of these were District Public Health Nurses (40.9%) and District Health Information and Records Officers (23.9%). Only 49 (25%) of the District Health Management Team members had undergone training at the supervisory level. Eighteen districts (43.6%) had no member of the District Health Management Team that had ever been trained at the supervisory level. Using rates of Pentavalent 1 and measles coverage, Nyanza Province had the highest immunisation dropout rate (Pentavalent 1 – measles) whereas Rift Valley Province had the lowest. The annual cumulative coverage for all the provinces by antigen was 80% for Pentavalent 1 and 2 and 60% for measles. The most requested need for inclusion in the training curriculum was maintenance of the cold chain equipment.**

Conclusions: **Most of the members in the study area have not been trained on Expanded Programme on Immunisation and may be ill-equipped to manage the complicated programmes needed to maximise delivery of services. The immunisation coverage in this area is low while the dropout rates are high. We therefore recommend that all the mid-level managers of Expanded Programme on Immunisation in this area be trained comprehensively through the Merck Vaccine Network - Africa programme using the World Health Organisation approved mid-level managers course.**

INTRODUCTION

Worldwide immunisation coverage has increased dramatically over the past two decades, with global vaccination rates exceeding 75%. However great disparities still persist, with developing countries in sub-Saharan Africa having the lowest coverage, while also being the same areas where the burden of immunisable disease is greatest. Approximately two million people die annually from diseases that could be prevented by widely available vaccines, with about 75% of these deaths being children below five years of age (1). With the most common infections being measles, *Haemophilus influenza B*, pertussis and neonatal tetanus, vaccine preventable disease mortality represents 14% of the global mortality of children under five years of age (2). Immunisation coverage in Kenya has been low and even after these periods of intensified efforts, barely exceeds 70% coverage, with great variability from district to district ranging from less than 50% coverage in some to nearly 90% in others (3). The under one year old children who complete the KEPI schedule in Kenya are 48.7% and those who do not get vaccinated at all are 8.1% (4). These figures are unacceptable and need to be corrected.

The goal of the Merck Vaccine Network — Africa (MVN-A) programme is to improve the overall immunisation coverage in Western Kenya. This will be accomplished by developing and implementing an educational programme to improve the managerial and analytical skills of the mid-level managers of KEPI in this region, utilising the WHO EPI Mid-level Management Course for EPI Managers, modified to address Kenyan specific issues. There has been no comprehensive training for these managers in the country for over 15 years, which would appear to be a significant deficiency, and likely to be a contributing factor in continued high occurrences of vaccine-preventable disease.

As a first step in accomplishing these goals, an assessment of the current status of KEPI was conducted. Western, Rift Valley and Nyanza Provinces were selected as target provinces. A survey instrument was developed and administered to the KEPI managers in these provinces and district levels.

MATERIALS AND METHODS

Study area: The MVN-A programme in Kenya is a collaborative effort between the Moi University (MU), Indiana University (IU) and the Ministry of Health through the Kenya Expanded Programme on Immunisation (KEPI). Following several meetings between the collaborators it was agreed that the three provinces in Western Kenya, namely Western, Rift Valley and Nyanza provinces, be targeted. These were purposefully selected due to their proximity to Moi University and the scheduled duration of the programme, which was four years.

These provinces comprise thirty nine districts and approximately 50% of the Kenyan population. They are mainly agricultural areas with the primary cash crops being maize, wheat, sugarcane and cotton. Fishing and dairy farming are also practiced. However, several districts in the study region which are semi-arid to arid have little agricultural activities other than pasturing livestock and their population density is very low.

Study population: The survey targeted the mid-level managers of the Kenya Expanded Programme on Immunisation from the provincial to the district levels. These managers include the Provincial Logisticians (PL) and Provincial Medical Officers (PMOs). At the district level these positions include the District Medical Officers of Health (DMOH), Public Health Nurses (DPHN), Public Health Officers (DPHO), Health Records and Information Officers (DHRIO) and the District Disease Surveillance Officers (DDSO). These were purposefully chosen because they are involved in the daily KEPI activities in their districts. They are responsible for the supervision of the officers who carry out the KEPI activities under them.

DATA COLLECTION

Survey instrument: The survey instrument was a questionnaire that had questions on the institutional profile, demographic data, staff training on immunisation, services related to immunisation that were provided by the institution, general evaluation

Table 2

Immunisation coverage for each antigen and Province

Nyanza Province District	BCG	Birth Polio	Penta 1	Polio 1	Penta 2	Polio 2	Penta 3	Polio 3	Measles	Target Population	Dropout Rate
Bondo	72	43	72	61	61	55	51	48	43	12,257	40.2
Gucha	102	73	84	86	80	85	78	84	75	20,286	10.7
Homa Bay	91	52	87	83	69	69	64	63	50	14,302	42.4
Kisii	104	87	85	88	82	85	75	81	80	20,630	6.16
Kisumu	107	76	98	98	86	89	75	79	64	22,331	35.2
Nyamira	106	100	110	101	106	103	107	100	91	19,885	16.8
Nyando	75	0	69	56	60	61	46	51	44	12,880	36.3
Rachuonyo	70	42	71	70	53	56	46	48	41	14,613	42.4
Suba	105	69	85	86	64	68	57	58	58	7,763	31.8
Western Province District	BCG	Birth Polio	Penta 1	Polio 1	Penta 2	Polio 2	Penta 3	Polio 3	Measles	Target Population	Dropout Rate
Bungoma	93	22	78	81	68	74	56	64	59	48,904	24.1
Butere Mumias	101	46	99	91	87	89	74	75	68	23,169	30.8
Kakamega	100	40	94	91	80	81	68	73	59	29,083	37.2
Mt. Elgon	97	18	88	90	82	81	72	74	69	7,783	22.3
Teso	78	28	81	80	77	77	71	73	64	9,952	21.5
Rift Valley Province District	BCG	Birth Polio	Penta 1	Polio 1	Penta 2	Polio 2	Penta 3	Polio 3	Measles	Target Population	Dropout Rate
Baringo	83	0	75	79	70	79	65	75	74	12,517	1.22
Bomet	82	54	63	63	65	63	55	59	52	18,706	17.7
Bureti	107	85	99	100	96	100	86	90	88	14,661	11.8
Keiyo	71	63	59	64	55	63	53	61	60	5,929	-2.4
Kajiado	70	54	69	68	65	64	60	58	51	18,652	25.7
Kapenguria	82	52	71	69	63	61	54	54	43	15,870	39.6
Kericho	102	77	93	90	84	87	81	83	74	21,551	20.7
Koibatek	64	64	61	60	60	60	57	57	59	5,874	3.35
Laikipia	83	58	75	72	74	73	72	70	64	13,727	14.2
Lodwar	107	74	107	99	95	90	81	76	73	12,215	31.7
Marakwet	96	61	86	85	81	83	73	75	66	6,202	23.3
Nakuru	117	99	94	97	87	95	77	87	78	50,998	17
Nandi North	87	59	77	79	75	80	67	72	63	13,432	18
Nandi South	71	39	63	65	57	62	49	55	47	13,433	26
Narok	57	30	56	50	52	52	43	48	39	20,476	30.4
Samburu	89	46	84	90	77	85	64	72	64	6,817	23.8
Trans Mara	94	45	92	91	85	87	72	74	60	8,789	34.8
Uasin Gishu	96	76	89	87	87	83	82	80	67	27,901	24.7

NB:Data is listed as percentage of the target population. Dropout rate is calculated as (Pentavalent 1 — Measles) ÷ Pentavalent 1 x 100

Table 3

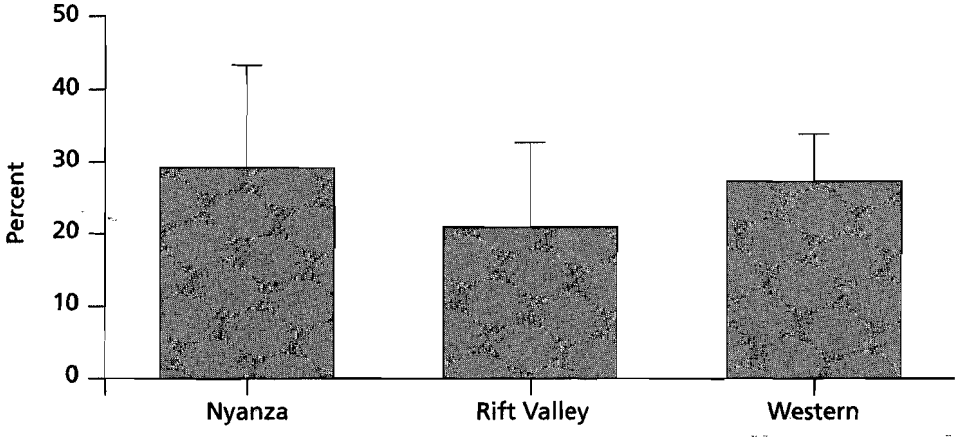
Strengths of the KEPI programme in the district

Comment	Frequency	(%)
Excellent quality of staff-staff works as a team	12	16.2
Supplies generally adequate for needs	12	16.2
Good cold chain maintenance	10	13.5
Have made significant improvements in expanding coverage	8	10.8
Improved record keeping	8	10.8
Regular staff updates and training	7	9.5
Improved social mobilisation	5	6.8
Good NGO support	4	5.4
Availability of transport is adequate	3	4.1
Vaccine distribution	3	4.1
Improved outreach	1	1.4
Good disease surveillance	1	1.4
Total	74	100

Figure 1

Dropout rates by province

Dropout from Pentavalent 1 to measles



NB: These were calculated as (Pentavalent 1 – Measles) ÷ Pentavalent 1

Figure 2 shows the cumulative coverage percentage by antigen. The difference between the slopes is equivalent to the dropout rates. "cumulative refers to the coverage in all the three provinces of Western, Nyanza and Rift Valley put together. The coverage was accumulating from month to month". There were no correlations between district population, population density and coverage rate of any antigen, nor of dropout rate.

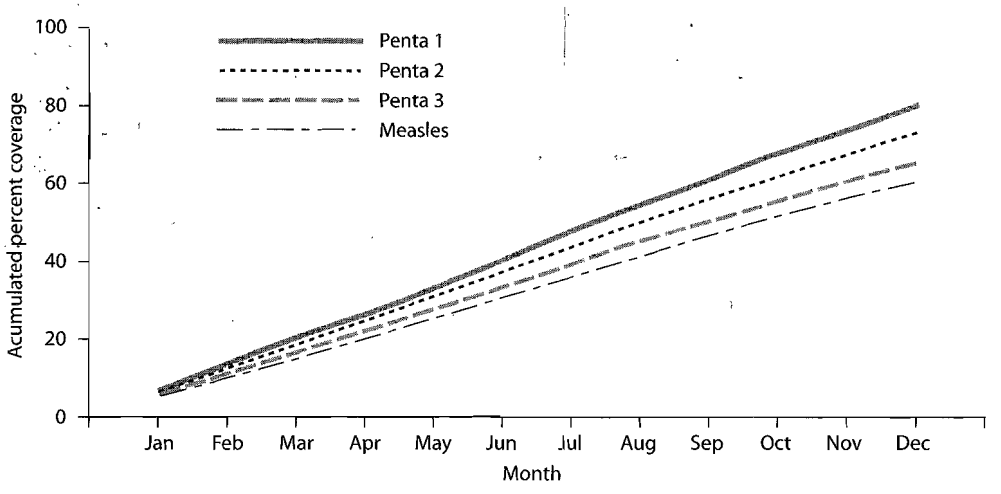
Only 49(25%) of the targeted members of the District Health Management Teams had undergone training at the supervisory level. Previous planning had targeted five members in each district, the DMOH, DNO, DHIO, DPHN and DCO. Of those who had received training, most had been trained more than ten years ago. Eighteen districts had no member of the DHMT who had received training.

The participants were asked to state any strengths of the KEPI programme in their areas. These responses are shown in Table 3 which shows that teamwork and good cold chain maintenance were the most frequently reported strengths.

Table 4 shows the weaknesses of the KEPI programme indicated by respondents. Inadequate transport, poor cold chain maintenance and inadequate staff numbers were the primary weaknesses identified.

Figure 2

Cumulative immunisation coverage by antigen



Data is cumulative sum of all three Provinces plotted by month

Table 4

Weaknesses of the KEPI programme in the district

Comment	Frequency	(%)
Inadequate transport facilities/vehicles	27	22.7
Poor cold chain maintenance	16	13.4
Inadequate staffing	15	12.6
Frequent stock-outs	15	12.6
Poor data collection tools	11	9.2
Poor training/lack of well trained staff	10	8.4
Poor supervision	7	5.9
Lack of supplies	6	5
Inadequate funds	5	4.2
Poor community mobilisation	2	1.7
Lack of incentives for staff	2	1.7
Poor vaccine distribution system	1	0.8
High staff turnover	1	0.8
Poor follow-up on dropouts	1	0.8
Total	119	100

Improvement of training opportunities and transport were considered the most important strategies for improving immunisation activities and therefore coverage in the districts (Table 5).

Training was considered to be the most effective means of improving coverage nationwide, as well (Table 6).

The most commonly mentioned topic that had not been adequately covered in previous training was cold chain maintenance (Table 7). It was also the one most requested for inclusion in the training curricula (Table 8), when respondents were asked for suggestions regarding what topics should be covered in future training. The next topic of concern that had not been adequately addressed in prior training, identified in Table 5 by the participants, was lack of training in data management, which the respondents requested to be included in any planned training curriculum (Table 8).

Table 5

Actions that are considered necessary to improve immunisation coverage in the district

Comment	Frequency	(%)
Improve and/or increase training opportunities	23	21.9
Assure adequate numbers of vehicles, including motorbikes	16	15.2
Improve antigen supply	13	12.4
Increase numbers of staff	12	11.4
Provide adequate cold chain equipment and maintenance	12	11.4
Improve social mobilisation	6	5.7
Increase funding for KEPI activities	5	4.8
Improve outreach	5	4.8
Increase number of immunising centers	4	3.8
Improve provision of supplies	3	2.9
Improve supervision	3	2.9
Provide computers for data management	1	1
Increase district storage capacity	1	1
Improve record keeping	1	1
Total	105	100

Table 6

Changes that would improve national KEPI programme

Comment	Frequency	(%)
More frequent updates and training	14	26.9
Decentralise disbursement of funds	8	15.4
Decentralise antigen and supply storage	5	9.6
Avoid stock outs	5	9.6
Improve data management and record keeping	4	7.7
Assure adequate vehicles	4	7.7
Increase staff numbers	4	7.7
Improve availability of cold chain equipment	3	5.8
Improve KEPI/Provincial supervision	3	5.8
Improve community mobilisation	2	3.8
Foster collaboration with other GK ministries	1	1.9
Provide training in supervisory skills	1	1.9
Improve equipment maintenance	1	1.9
Implement new innovations	1	1.9
Total	52	100

Table 7

Topics not covered in the previous training modules

Comment	Frequency	(%)
Basic maintenance of cold chain equipment	18	35.5
How to use data management and monitoring tools	13	25.5
Supervision skills	8	15.7
Vaccine safety	3	5.9
Financial management skills	3	5.9
Social mobilisation techniques	3	5.9
Logistics	1	2.0
Vitamin A supplementation	1	2.0
Roles of the DHMT personnel	1	2.0
Total	51	100

Table 8

Topics that should be included in the KEPI training modules

Comment	Frequency	(%)
Basic cold chain and refrigerator maintenance	15	34.9
Training in record keeping/data management, use of computers	12	27.9
Vaccine management and safety	3	7
How to achieve community mobilisation	3	7
Updates on new developments	2	4.7
Supervisory skills	2	4.7
Basics of EPI target diseases epidemiology and surveillance	2	4.7
IMCI and disease surveillance	2	4.7
How to involve NGOs	1	2.3
Logistical management	1	2.3
Total	43	100

DISCUSSION

Immunisation programmes have proved successful in most parts of the world in reducing mortality and morbidity in children below the age of five years. The exception has been in the developing countries where children continue to contract vaccine preventable diseases due to low coverage. Approximately 1.4 million children worldwide still succumb to these preventable diseases, with the majority being in the developing world (1). Almost 30 million children in the developing countries are still not adequately covered by the expanded programmes for immunisation, with almost ten million of these in sub-Saharan Africa (5).

Concerns identified by this survey include demonstration that Western Kenya has low immunisation coverage rates, similar to those seen in much of the developing world, especially sub-Saharan Africa (6). The annual cumulative immunisation coverage for all the provinces by antigen was 80% for Pentavalent 1 and only 60% for measles. This coverage was below the expected 80%. It was similar to the national rate and what was found in Mathare Valley, Nairobi but is higher than Cameroon which had a rate of 34%(2,4,6,7). There was no significant difference between the provinces and districts, despite the fact that the regions have significant cultural and socio-economic differences. Also of concern were the calculated dropout rates with Nyanza recording the highest dropout rate and Rift Valley the lowest, though this difference was not statistically significant. The dropout rates were above 20% in all the provinces which was much higher than the recommended 10% (KEPI personal communication). High dropout rates are an indication of poor utilisation of immunisation services. A variety of factors can affect utilisation. Dropout rates may be susceptible to error in regions with large migratory population leading to negative values or exaggerated measurements of dropout, but are still considered to be a valuable assessment tool for immunisation programmes.

The reasons identified by this study for these problems in these areas of Kenya were lack of adequate transport (poor roads and few vehicles), poor cold chain maintenance, inadequate staffing, frequent vaccine supply stockouts, poor data collection tools, lack of well-trained staff and poor supervision. Most of these may be a result of poor managerial skills, poor data management, poor analytical skills and poor supervisory skills. For example, lack of transport makes it difficult for the supervisors to reach their subjects, supplies to be delivered and dropouts to be followed. These problems are then compounded by inadequate staff support. The managers felt that to improve the situation in their areas, there was a need for more training opportunities, improved transport and antigen supply, increase in the numbers of staff and provision of adequate cold chain equipment and maintenance. The problems identified here were different from those found in Cameroon and Tanzania where cost of the vaccines, lack of

community participation due to perceived non-availability of service providers were the main causes of low coverage respectively (7,8).

The survey also showed that the mid-level managers in charge of KEPI in these provinces had not received comprehensive training on EPI over the last ten years. The few that had received some training had only received updates on specific aspects of the programme. This clearly indicated that these managers generally were poorly prepared to manage these immunisation programmes. They suggested that EPI training modules should include basic cold chain and refrigerator maintenance, training on record keeping, data management and vaccine safety management as priorities. However, though transport was the most quoted weakness in the programme, they did not feel the need to be trained on logistics, instead identifying this as an issue of resources, rather than management. The assessment of the training received by the mid-level managers of EPI has not been done in Kenya. These results therefore form a baseline on which training and training needs for these managers can be based in the future. The results also justify the need to train these managers and also highlight the areas that need to be emphasised during training. This is of utmost importance to the country and assists the KEPI manager to understand the current state of affairs. It will be possible for the MVN-A project investigators to gauge the impact of their training after four years.

From the findings of this survey it is evident that the mid-level managers have not been adequately equipped with knowledge and skills to run the KEPI programme effectively. The low coverage rates identified are likely multi-factorial, but may be related to poor data management, inadequate staff, low morale and lack of confidence and motivation by the staff. This scenario could pertain in the rest of the country and other areas of the developing world. The MVN-A programme could assist in improving the managerial, analytical and supervisory skills of these managers and could be readily introduced into the remainder of Kenya and East Africa, if shown to offer an effective means of improving programmatic management and immunisation coverage rates.

In conclusion, few mid-level managers have been trained on EPI over the last decade and there is need to train mid-level managers on cold chain maintenance, record keeping, data management and supervision. Immunisation coverage is still low in Western Kenya and there is a high drop-out rate (Pentavalent 1 – Measles) in most districts in Western Kenya. Transport and related logistics are major hindrances to provision of EPI services in the districts.

RECOMMENDATIONS

The MVN-A and KEPI should train the mid-level managers of the programme in this region over the next four years.

Transportation should be improved by the Government of Kenya by providing vehicles and motorbikes.

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