Evaluation of Post-Training Monitoring of CHWs in Community-Based Epidemiological Surveillance Activities (SEBAC): Case of the Districts of Kadiolo, Kati and Kangaba in Mali from 2020 to 2021

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Abstract

The post-training follow-up of actors is undeniable for an effective and efficient implementation of community surveillance activities (SEBAC). We evaluated the supervision data from the three SEBAC health districts (Kadiolo, Kati and Kangaba). The variables analyzed are as follows: The percentage of CHWs mastering the case definitions: in Kati (100%), Kangaba (82.87%) and Kadiolo (71.97%). Next, knowledge of coding: at Kati 99.18%, Kadiolo 95.62% and Kangaba 84.08%. Regarding the number of notified cases: in Kadiolo 124 cases (36%), Kati 123 (35.8%) cases and Kangaba 97 cases (28.2%). Also, for the filling of the notification and score registers: at Kati 99.18% and 100%, Kadiolo 86.18% and 86.18% and Kangaba 82.12% and 80%. As for investigations, the three districts have a parity rate of 100%; for home visits, Kati has a rate of 100%, followed by Kadiolo 95.23% and Kangaba 92.80%. Also, for the number of CHWs having sent at least one SMS: Kati 100%, Kadiolo 98.52% and Kangaba 91.50%. Finally, for data completeness, Kangaba district has 85.68%, Kadiolo 71.56% and Kati 48.91%. Post-training supervision is an effective means for building capacity in the implementation of activities, correcting shortcomings, and a source of motivation for actors.

Keywords: Supervision, community-based surveillance, post-training follow-up, SEBAC, CHW.

Introduction

Since the design and adoption of the "Primary Health Care" (PHC) strategy at the global level, no one has understood that health interventions only succeed with community participation. This is achieved through its various axes. including support by Community Health Workers (CHWs) or health volunteers for health care in general and for the surveillance of diseases and health events in particular Throughout the world, with its 190 National Societies and of its 17 million volunteers, the Red Cross Red Crescent network is ideally suited to implement community-based surveillance in collaboration with health ministries and local partners to ensure rapid detection of threats to public health and preventive action if the situation worsens Based on a global approach to health threats, community-based surveillance seeks to detect any changes in human, animal and animal health at an early stage. and environmental that could have a negative impact on a larger scale [1].

Indonesia is one of eight countries in which the International Federation, in collaboration with National Red Cross and Red Crescent Societies, has implemented the Community Epidemic and Pandemic Preparedness Program, a program of which community-based surveillance (CBS) is one of the key elements. In its innovative approach to integrating syndromic community surveillance (SCS) into essential community activities for risk reduction and health promotion [2].

In Africa and other low- and middle-income regions, public health structures struggle to be effective due to constraints related to lack of public funding, lack of health personnel and the difficulty of providing reliable and reliable medicines. quality in a timely manner. This is how Living Goods, established in Uganda with 1170 Community Based Health Workers (CBHWs) and in Kenya with 710 CHWs between 2016 and 2018, has implemented a successful, quality, and sustainable public health program [3].

In several African countries such as Madagascar [4] and Côte d'Ivoire [5], Community Agents (CA) selected by members of their community and then trained for SEBAC have been strengthened by the supervision of heads of primary health centers and this improved their performance.

The District approach in 1985, which favors the development of health sectors based on an operational unit, was for the first time to implement and develop in Mali the " Bamako initiative in 1987" centered on the call for community participation to health development, but the community-based surveillance approach had not been systematically integrated into this policy strategy [6].

Years later UNICEF and the International Medical Corps (IMC) in Ségou, Measure Evaluation in Kati, the International Federation of Red Cross and Red Crescent Societies and the Malian Red Cross in Keniéba and Koulikoro, Catholic Relief Services (CRS) in Kayes, Sikasso and Mopti supported the various technical structures in experimenting with this SEBAC concept with the aim of complementing the Bamako initiative [7, 8, 9].

To this end, community health programs generally call on community health workers (CHWs) to remedy the lack of access to health care and case finding, particularly in low- and middle-income countries. As such, the effective implementation of community activities requires regular monitoring. Thus, supervision has long been recognized as an essential element for building the capacities of SEBAC actors and the success of CHW programs; but it is often considered to be of poor quality or absent [10]. It is also an excellent opportunity to provide ongoing training, improve outcomes, and address other systemic issues that contribute to poor data quality, case finding, mastery of standardized definitions, mastery of use of collection tools, awareness-raising, investigations and reporting of information to the higher level, but also the provision of care in a health centre.

Although supervision can be an interactive process, traditional supervisory visits focus more on inspection and troubleshooting as well as problem solving to improve results. In addition to evaluating performance, supervisors must also monitor services, evaluate management, and ensure the proper functioning of the notifiable disease surveillance system, all within a time frame. For lack of financial means for adequate organization, the implementing actors are often left without orientation, with an insufficient or even non-existent setting of objectives to evaluate their results until the next supervision visit. Supervision should help set goals, monitor results, identify, and correct problems, and improve the quality of services provided. Thus, the supervisor and the supervised agents must identify the shortcomings on the spot and invest in them, thereby preventing bad practices from becoming habits. In addition, supervisory visits also represent an opportunity to encourage good

practices and help agents maintain a satisfactory level of service [11].

Supervision must be formative, to encourage the improvement of the quality of actions at all levels of the health system by strengthening the relationships within the said system, emphasizing the identification and resolution of problems and by contributing to the optimization of the allocation of resources, but also by promoting teamwork and better communication [12].

Overall surveillance activities also represent the basis for the preservation of the well-being of the populations, but the implementation of this encounters several insufficiencies of an organizational, formative, monitoring and regular coaching order. Wherever this strategy is undertaken, monitoring is done in terms of control and supervision, essential functions to be carried out for its success. On the other hand, in Mali, the implementation of this integrated approach in the districts of Kadiolo, Kati and Kangaba by the Ministry of Health since 2020 in partnership with the IDDS project has not yet benefited from a study highlighting the impact of monitoring functions including control and supervision. the objective was to assess the quality of the data and the importance of the post-training follow-up of the actors implemented in this new approach.

This study aims to highlight the contribution of supervision in improving the quality of this new monitoring approach.

Methodology

Community-based surveillance is a very important tool for the detection and rapid notification of public health threats in districts such as Kadiolo bordering Côte d'Ivoire and Kati and Kangaba for Guinea. It is for this purpose that the General Directorate of Health has opted for the use of mobile telephony for the notification of cases of diseases and events, standardized definitions of diseases for the recognition of cases and specific codes for notification. of each disease early in the community. In addition, it has also developed notification and tally registers which are used to collect precise information on the cases detected to facilitate investigations.

As such, during the supervisions certain variables were listed as important for the performance of the activities. Thus, statistical tests based on the Statistical Package for the Social Sciences (SPSS) were carried out to highlight the impact of supervision on community-based surveillance activities.

Each district was supervised three times in succession, to improve the quality of the implementation of activities. Thus, the supervision reports of the first, second and third passage were analyzed and compared to highlight the contribution of the latter in improving the quality of interventions.

To this end, the district of Kadiolo had 72 ASC sites including 70 functional and 24 CSCom, Kati 42 ASC sites and 15 CSCom and Kangaba 52 ASC sites including 51 functional and 17 CSCom (163 ASC and 56 CSCom assessed). These different sites were subject to a standard supervision grid used by the Ministry in charge of health in Mali.

Our approach consisted in collecting the three supervision reports and the supervision grids to analyze the results obtained and then to compare them to draw objective conclusions. Thus, we performed statistical tests with SPSS version 20 software to assess the law of normality between our samples and of correlation between certain variables. For this purpose, we used the Shapiro Wilk test with a significance level greater than 0.05 ($p>0.05$) to conclude that the distributions are normal between the samples. Then we carried out a partial correlation to determine if there is a linearity between the regular passages of supervision and the improvement of the capacities of CHWs. Then we carried out a Pearson "R" correlation test in order to check whether supervision has an impact on the number of CHWs mastering the definitions, the coding and the number of cases notified, finally

to determine the link between the notification case, mastery of the definition and codification, for this purpose if: (R=1 or close to 1 and a p < **0.05;** rejection of the null hypothesis ''H $_0$ '' and acceptance of the 'alternative hypothesis ''H $_1$ '') we can conclude that there is a significant correlation.

Results

We notice the percentage of mastery of case definitions is higher in the district of Kati (100) for the three passes. However, the percentage of CHWs mastering the coding is higher at the third round for all the districts than for the other two rounds and varied [91.48-100%]. The correct filling of the two tools is higher and equal on the first pass than the others (100%) in Kati and Kadiolo. We also note an increase in the number of cases notified after each supervision ranging from [09-75 cases] with an investigation rate (100%) for all passages. For the realization of VAD and talks we find the best rate (100%) in Kati for all passages. At the last pass (100%) the CHWs sent at least one SMS. In our study, the various statistical tests were carried out with IBM SPSS Statistics version 25, for this purpose the homogeneity test for Shapiro Wilk, the distributions are not normal between the populations at the level of the first supervision (p = 0.02 <0.05) on the other hand they are so for the second (p=0.11>0.05) and the third supervision (p=0.34>0.05). According to our Pearson partial correlation test, the regular supervisions (monthly) are correlated with each other, so we have a correlation between the first and the second passage (R=0.92) and a moderately weak correlation with the third passage (R =0.74) and between the third and the second passage (R= 0.91) we also note an identical level of significance p <0.05 for the first and the other passages, however between the third and the second p = 0.13>0.05.

Table 1. Table of Distribution of Observations by Supervision of the District of Kadiolo 2020-2021

Data collected.	1st post Kadiolo training supervision (N=67)	%	2nd supervision Kadiolo post-training (N= 70)	%	3rd post Kadiolo training supervision. (N =70)	%
Mastery of case definitions	48	71.64	50	71.42	51	72.85
Mastery of coding	63	94.02	70	100.00	65	92.85
Correct filling of notification registers	67	100.00	54	77.14	57	81.42
Correct filling of tally registers	67	100.00	54	77.14	57	81.42
Number of alert cases notified	15	-	34	-	75	-
Number of cases investigated	15	100.00	34	100.00	75	100.00
Number of VAD and group talks carried out	67	100.00	70	100.00	60	85.71
Number of CHWs having sent at least one SMS	65	97.01	69	98.57	70	100.00
SMS completeness	83.00	83.00	73.68	73.68	58.00	58.00

CI= 95%; alpha risk = 0.05

We note that the percentage of relays mastering the case definitions was higher during the third pass (72.85%). However, the percentage of relays mastering the coding was higher during the second pass than during the other passes (100.00%). The correct filling of the two tools is higher and equal to the first pass than to the others (100.00%). However, we note an increase in the number of cases notified after each supervision ranging from [15-75 cases] with an investigation rate (100.00%) for all visits. For the realization of VAD and talks, we note a completeness (100.00%). At the last visit (100%) relays sent at least one SMS.

For our test of homogeneity, the distributions are not normal between the populations at the level of the first supervision (p=0.02<0.05 for Shapiro Wilk), but they are for the second (p=0.11 >0.05 for Shapiro Wilk) and the third supervision (p=0.34>0.05 for Shapiro Wilk). According to our Pearson partial correlation test, regular (monthly) supervisions are correlated with each other, so we have a strong correlation between the first and the second visit (R=0.92) and a moderately weak correlation with the third visit (R=0.74) and between the third and the second passage (R= 0.91) we also note an identical level of significance P<0.05 for the first and the other passages, on the other hand between the third and the second p=0.13>0.05.

Table 2. Table of Distribution of Observations by Supervision of Kati District 2020-2021

Data collected.	1st Kati post-training supervision (N=34)	%	2nd Kati post-training supervision (N=41)	%	3rd Kati post-training supervision (N=41)	%
Mastery of case definitions	34	100.00	41	100.00	41	100.00
Mastery of coding	34	100.00	41	100.00	40	97.56
Correct filling of notification registers	34	100.00	41	100.00	40	97.56
Correct filling of tally registers	34	100.00	41	100.00	41	100.00
Number of alert cases notified	10	-	79	-	34	-
Number of cases investigated	0	100.00	79	100.00	34	100.00
Number of VAD and group talks carried out	34	100.00	41	100.00	41	100.00
Number of CHWs having sent at least one SMS	34	100.00	41	100.00	41	100.00
SMS completeness	28.00	28.00	59.78	59.78	58.95	58.95

CI= 95%; alpha risk = 0.05

We find that the percentage of CHWs mastering the case definitions is higher for the three rounds (100), but the percentage of CHWs mastering the coding and filling of the notification registers is lower on the third pass than the others (97.56%). However, the correct filling of the tally registers was higher during the three passages than the others (100). We

also note an increase in the number of cases notified after the first supervision ranging from [10-79 case] and dropped on the third pass to (34 cases), with an investigation rate (100%) for all passages. For the realization of the VAD and talks we note at all the passages (100%). At the last pass (100%) the CHWs sent at least one SMS. Also, for completeness the high rate is observed at the second passage (59.78%).

For our homogeneity test, the distributions are not normal between the populations since our significance level is p<0.05 for the three supervisions (p=0.00<0.05 for Shapiro Wilk). According to our Pearson partial correlation test, regular supervisions (monthly) are correlated with each other, so we have a correlation between the first and the second passage (R=-1) in addition to the third passage (R=0.99) and between the third and the second passage (R=0.99) we also note an identical level of significance P=0.00<0.05 for all the passages.

Table 3. Table of Distribution of Observations by Supervision of Kangaba District 2021

Data Collected	1st supervision post Kangaba Training (N=51)	%	2nd post-training supervision Kangaba (N=51)	%	3rd Kangaba post-training supervision (N=47)	%
Mastery of case definitions	46	90.19	45	88.23	33	70.21
Mastery of coding	39	76.47	43	84.31	43	91.48
Correct filling of notification registers	39	76.47	40	78.43	43	91.48
Correct filling of tally registers	40	78.43	39	76.47	40	85.10
Number of alert cases notified	9	-	18	-	70	-
Number of cases investigated	9	100.00	18	100.00	70	100.00
Number of VAD and group talks carried out	46	90.19	45	88.23	47	100.00
Number of CHWs having sent at least one SMS	45	88.23	44	86.27	47	100.00
SMS completeness	85%	85	93.98	93.98	78.08	78.08

CI= 95%; alpha risk = 0.05

Table 3 shows that the percentage of relays who master the case definitions is higher for the three variants [70.21-90.19], but that the percentage of relays who master the coding is higher for the third variant than for the others (91.48%).

The number of correctly filled notification registers was higher in the third pass than in the others (91.48%) and (85.10%) for the tally registers. There is also an increase in the number of cases notified after each supervision ranging from [9-70 cases] with an investigation rate (100%) for all visits. For the

implementation of VAD and talks, we note an uneven evolution with a high rate at the third visit (100%). On the last visit (100%), the relays sent at least one SMS. Similarly, for completeness, the highest rate is observed during the second visit (93.98%).

Compared to our Shapiro Wilk test of homogeneity, the distributions are normal between the populations of the first supervision (p=0.07>0.05) and the third supervision (p=0.10>0.05) but not for the second (p= 0.01<0.05). According to our Pearson partial correlation test, regular (monthly) supervisions are correlated with each other. Thus, we have a correlation between the first and the second passage (R=0.99) in addition to the third passage (R=0.91) and between the third and the second passage (R=0.91) we also note an identical level of significance P=0.00<0.05 for all passages.

Table 4. Comparison Table of District Performance for the Three Key Variables

Passage by health district	Number of CHWs familiar with case definitions	%	Number ASC mastering coding	%	Number of alert cases notified by CHWs
1st supervision Kangaba (n = 51)	46	90.19	39	76.47	9
2nd supervision Kangaba (n = 51)	45	88.23	43	84.31	18
3rd supervision Kangaba (n = 47)	33	70.21	43	91.48	70
1ere supervision Kati (n = 34)	34	100.00	34	100.00	10
2nd term supervision (n = 41)	41	100.00	41	100.00	79
3rd grade supervision (n = 41)	41	100.00	40	97.56	34
1st supervision Kadiolo (n = 67)	48	71.64	63	94.02	15
2nd supervision Kadiolo (n = 70)	50	71.42	70	100.00	34
3rd supervision Kadiolo (n = 70)	51	72.85	65	92.85	75

IC = 95%; risk alpha = 0.05

About table 4, we note that the district of Kati has the highest rate concerning the mastery of definitions and coding (100%), but the district of Kadiolo has the large number of notified cases 124 case against 123 case for Kati and 97 case for Kangaba.

Shapiro Wilk 's test distributions within our populations number of notified alert cases (p=0.06>0.05) and mastery of case definitions (p=0.36>0.05) are homogeneous. On the other hand, there is a very significant heterogeneity (p= 0.04<0.05) for the population, the number of CHWs proficient in coding.

Also, according to the Spearman test, there is no correlation between the fact of notifying cases and the mastery of message coding (R=0.44), also between it and the mastery of case definition (R =0.00), however there is a weak correlation between mastering the cases of codification (R=0.51).

Discussions and Comments

Supervision of community health workers (CHWs) is an area that has not been sufficiently studied. Thus, during the observed period, each district carried out three supervisions according to the following schedule: the first, one month after the training, the second the following month and the third took place one quarter after the second.

Our study showed that the percentage of CHWs mastering the case definitions was very high during our three visits to Kati (100%), followed by Kangaba [70.21-90.19%] with an average performance of 82.87 %, and finally Kadiolo [71.42-72.85%] with an average performance of 71.97%. Regarding coding

knowledge, the performances vary as follows: Kati [97.56-100.00%] or an average of 99.18%, Kadiolo [92.85-100%] or 95.62% and Kangaba [76.47-91.48%] or 84.08%. Regarding the number of reported cases, Kadiolo recorded the highest number of cases, 124 cases, followed by Kati: 123 cases and Kangaba 97 cases.

For filling registers: Kati had [97.56-100.00%], i.e., an average performance of 99.18% for notification registers and 100% for pointing registers, Kadiolo [81.42-100 .00%], i.e., 86.18% for filling the notification and clocking registers, and finally Kangaba [76.47-91.48%], i.e., 82.12% for the notification registers against [76, 47-85.10%], or 80.00% for clocking registers.

As for investigations, the three districts had a parity rate of 100%, and in terms of home visits, Kati had the highest proportion with a variability of 100%, followed by Kadiolo with [85.71-100%], a cumulative performance of 95.23%, and Kangaba with [88.23-100.00%], a performance of 92.80%.

Similarly, concerning the average number of CHWs who sent an SMS, we note Kati (100.00%), Kadiolo [97.01-100.00%], an average of 98.52% and Kangaba [86.00%. 27-100.00%] i.e., 91.50%. Finally, for completeness, Kangaba district has the highest rate, varying from [78.08-93.98%], i.e., a cumulative average of 85.68%, followed by Kadiolo [58.00-83, 00%] or 71.56% and Kati [28.00-58.95%] or 48.91%.

According to Shapiro Wilk's normality test, our samples (knowledge of definitions and notification of cases) are homogeneous and statistically significant ($p>0.05$); however, they are heterogeneous for coding knowledge ($p<0.05$).

In sum, by observing the performance of the different variables, the district of Kati has the highest rates for 7/9 of the variables collected, i.e., 78%, this may be since the district of Kati was running an almost similar model before. the standardization of the community surveillance approach decided by the Directorate General for Health [13].

We note a level of significance $p>0.05$ for the first and the second passage of Kangaba, and the same for the second and the third passage of Kadiolo. On the other hand, we have no significance at Kati as well as at the first passage of Kadiolo and at the third passage of Kangaba ($p<0.05$). This could be explained by the fact that in Kati and for the insignificant passages, the dynamics of regularity of supervision had not been respected due to the lack of availability of the districts or the lack of financial resources, but also to because of the accessibility of the sites during the rainy season.

To this end, our results of the correlation coefficient tests carried out between the different supervision sessions and the performance of the implementation of the activities are as follows: for all the variables, the correlation coefficient "R" is close to 1. We therefore conclude that the more regular and close the supervision, the more it has a significant influence on the results of community monitoring activities. In summary, we can say that regular supervision activities contribute to improving indicators, strengthening skills, motivation, and ownership of activities by actors.

Also, the study carried out by Avortri Gertrude Sika maintains that supervision makes an important contribution in improving data quality, but also in mastering the actions to be implemented, motivation at work, satisfaction and better performance [14]. These findings are also supported by Marquez and Kean who state that supportive supervision promotes quality outcomes, improves communication, problem solving, facilitates teamwork, and provides guidance and support so that health care providers health can monitor and improve their own activities. The continued implementation of supportive supervision creates continuous performance improvement [12].

Findings from an exploratory mixed-methods study reveal the fragmented and uncoordinated provision of supervision by volunteer CHWs in the context of one area of Mukono District, Uganda. In addition, the study notes that the majority of CHWs in this study agreed that supervision on a quarterly basis, the style and mode of supervision and the supervisor varied greatly from one supervision to another and thus had repercussions on their productivity. It thus highlights the need to pay greater attention to the design and implementation of regular supervision programs [15].

In addition, a study carried out in 2014 on the perception of motivation, maintenance, and incentive for the performance of CHWs in the district of Rufisque in Senegal showed that community health workers in this profession are motivated, among other things, by the love of work and the feeling of playing an important role in improving the health of the community. This study also found that reasons for quitting included lack of financial motivation, limited time to pursue other income-generating activities, and insufficient community support.

Genuine pandemic preparedness and response requires replacing bi/multilateral aid and private philanthropic investments that hinder the institutionalization and professionalization of CHWs with investments made in partnership with a recipient country [17].

Evidence from a mixed methods intervention study in four sub-Saharan African countries (Ethiopia, Kenya, Malawi, and Mozambique) shows that support group supervision, when combined with individual and/or group supervision may improve the motivation and performance of community health workers (CHWs), although qualitative and quantitative findings differed [18].

There is evidence to suggest that supportive supervision improves the performance of health workers, including CHWs, and the quality of care [19].

Preparing for and responding to a real epidemic requires replacing bilateral/multilateral aid and private philanthropic investments that hinder the institutionalization and professionalization of community health workers with investments made in partnership with a recipient country [20].

Conclusion

Post-training supervision in surveillance activities is very important because it provides technical support for the smooth running of activities, in particular mastery of methodologies, improvement of knowledge and skills as well as ownership of activities, motivation, and satisfaction.

Our results shed light on the importance of the regularity of the supervisors, and on the importance of implementing a remuneration and incentive plan for the CHWs who today the key links in the community approach are so desired by the World Health Organization.

It will be said for this purpose that they must be done on a regular basis as a kind of interactive continuing education emphasizing communication and must in no case be on a kind of control to blame or reprimand.

To sustain them, all stakeholders, in this case the State, implementing partners, those responsible for community programs and the health workers themselves, must make significant efforts in terms of motivation, effectiveness and efficiency for this essential workforce. It is therefore urgent that stakeholders consider these recommendations to better consider the concerns of the latter, to improve the health of the population.

Limits

Supervision was not carried out at the same periods, the district of Kati had already benefited from an almost similar supervision model before the other districts, the poor reporting and archiving of certain supervision

reports sometimes had an impact on the implementation of the study.

Conflict of Interest

All authors and co-authors declare that they have no conflict of interest for the work submitted.

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