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Abstract

In Madagascar, in February 2014, the Ministry of Health and UNICEF implemented a program integrating the diagnosis and treatment of pneumonia into malaria community case management. The objectives of this program were to improve the management of cases of malaria and pneumonia by community health workers to alleviate the problem of accessibility to care and to reduce the number of severe cases treated at health facilities. This paper aims to assess the effectiveness and the efficiency of this. Two districts were taken into account: Andapa received only basic activities ensuring the functionality of the community sites (control district) and Antalaha where all activities related to the program were implemented (treated district). To assess the impact of the program, we use the difference in difference methodology and we compare the period before the implementation of the program in January 2014 and the period when the program is implemented in February 2016. Then cost-effectiveness analysis was made. In Antalaha, although the program has no significant impact on pneumonia, the situation is better than that of Andapa, as in the case of malaria management, the difference is significant between the two districts. The cost-effectiveness analysis also demonstrated that the cost per case of additional malaria and pneumonia treated by CHWs is 2.52 USD (2.44-3.50). However, skills of CHWs should be strengthened especially concerning pneumonia cases management.

Keywords

Madagascar, Malaria, Pneumonia, Community health workers, Difference in difference methodology, Cost-effectiveness.

JEL codes

I15, I12, I18

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1. Introduction

Since 2000, in Madagascar, significant progress in the reduction of infant mortality was observed. Indeed, between 2000 and 2013, the death rate of children under 5 decreased from 109.2 to 53.4 per 1,000 live births (WDI, 2015). However, this rate remains high compared to the world average of 45.6 in 2013. This rate is 14.3 in Mauritius, a neighboring island; it is 4.4 in France and the lowest infant mortality rate is registered in Norway with 2.8 per 1,000 live births (WDI 2015).

In Madagascar, malaria, pneumonia and diarrhea are the leading causes of death of children. 34% of deaths among children aged between 1 to 59 months are caused by these three diseases (WHO, 2013). However, many deaths could have been avoided through preventive actions, curative treatment and appropriate treatment. The problem is that many households have difficulty access to care because of the geographical distance between their houses and the health center, the shortage of medical staff and the lack of money. Therefore, the: Integrated Community Case Management (ICCM) approach was implemented to solve this problem. Community health workers (CHWs) diagnose and treat simple childhood illnesses. To this end, they receive basic training followed by supervision, tools and inputs for their activities. Thus, at the community level, simple malaria cases are diagnosed by CHWs using Rapid Diagnostic Test (RDT). Positive cases are treated with "Artemisinin-based Combination Therapy" (ACT), simple pneumonia cases are treated with Cotrimoxazole and simple diarrhea cases, with a combination of Zinc-ORS (Oral Rehydration Solution). Severe cases are referred to health centers. According to the World Health Organization (WHO, 2012), this strategy reduces the mortality rate of children under-five and hence induces WHO and UNICEF to promote it (Lawn and Kerber, 2006).

In Madagascar, ICCM has been in place in 2011 in all the 22 regions and the CHWs were trained in the management of malaria, pneumonia and diarrhea cases. However, in 2012, inputs stock shortages for the treatment of diarrhea and pneumonia were observed at the community level (PNLP Annual Report, 2012). As acute respiratory infections (ARI), including pneumonia, are the leading causes of death in the Island (MOH, Health Statistics, 2012) a strengthening of the ICCM have been done.

The Malagasy Ministry of Health (MOH) and UNICEF in February 2014 decided to provide to each CHW an ARI-timer ("Acute respiratory infections timer") to detect pneumonia cases and Amoxicillin-DT (dispersible) tablets for the treatment of this disease. The program targets children under-five who are vulnerable to these diseases because of their low immunity (UNICEF, 2014). CHWs' skills were strengthened through training, formative follow-up and retraining. These activities were carried out in Antalaha, a district in the SAVA region. In Andapa, CHWs received initial training and inputs, activities that ensure the survival of sites. Indeed, in areas that have not supported by technical and financial partners (TFP), most community sites are no longer functional. This is the case of the district of Sambava (District Health Service of Sambava, 2015). After the initial training on the implementation of the ICCM in 2011, CHWs in this district have received neither training nor inputs. As a result, they no longer managed cases. Thus, in this district, CHWs do not report their activities to the heads of the health facilities. This situation explains the lack of information and data on the number of cases handled by the CHWs in this district.

This region was chosen by the MOH and UNICEF because in 2012, severe malaria is the second leading cause of hospital morbidity in children under-five and pneumonia the fourth (MOH, Health Statistics, 2012). Both diseases are the leading causes of death in this age group (Regional Health Office of SAVA, 2015).

The integration at the community level of pneumonia and malaria management is a new and debate strategy. It implies a reorganization of children healthcare even it is considered as an innovative strategy. In Madagascar, this strategy needs to be boosted as it seems to be low used since its implementation in 2011. UNICEF decided to strengthen this strategy by supporting CHWs training and introducing ARI-timers. But, before embarking on the scaling, evaluate the impact of additional activities, both from the point of view of its effectiveness and its efficiency is needed. It is the objective of our paper.

2. Literature review

To solve the problem of accessibility to healthcare, CHWs are trained on community case management. According to WHO (2012), this system can reduce costs and decrease the mortality and morbidity rates, especially among children under 5 years old. The study of Theodoratou et al. (2010) about the case of low income countries shows that malaria community case management can decrease from 60% mortality related to this disease and all-cause mortality in children less than 5 years to 40%. Pneumonia community case management in turn can reduce the mortality related to it by 70%.

In case of fever, CHWs use RDT. A positive test indicates a case of malaria. Simple malaria cases are treated immediately with ACT and severe malaria cases are referred to health facilities. Then, the CHWs count the child's breathing rate with ARI-timer. If the frequency is higher than normal, it is pneumonia. Counting the breathing rate is a problem for some CHWs who have difficulty to assess it. However, drug overdose can cause antibiotic resistance and increase case fatality rate (Druetz et al., 2013).

Some CHWs, specifically the unpaid CHWs, busy with their own daily activities, spend little time on community case management. In Rwanda, for example, they spend 0.2 hour per week (1% of their time) to community case management; the rest is devoted to economic and domestic activities (Jarrah et al., 2013a). In some countries, such as Malawi, CHWs receive wages, so this rate may be as much as 40% of their time (Jarrah et al., 2013b).

Like other program, the ICCM can entail direct and indirect costs. These costs vary considerably from country to country. In most cases, the most important expenditures are related to drug supply, training and CHWs equipment (Jarrah et al., 2013a). Table 1 shows the costs of that program in several African countries.

Table 1: ICCM costs in other countries

Authors	Countries	Costs	Recommandations
Jarrah et al. (2013)	Rwanda	0.50 USD/total population /year 2.22 USD/target children/ year	- Find means to reduce supervision costs - Avoid the problems of registers and drugs stock-outs
Jarrah et al. (2014)	Sierra Leone	10.2 USD/ target children/year	- Find means to reduce supervision costs
Collins et al. (2014)	Cameroon, the Democratic Republic of the Congo, Malawi, Senegal, Sierra Leone, South Sudan and Zambia	2.07 to 10.26 USD/ target children/year	- Find means to reduce supervision costs and to ensure the quality of care. - Avoid bottlenecks like drugs stock-outs - Involve community leaders

Source: Authors, 2016

Concerning the impacts of the program, Abegunde et al. (2016) have conducted an impact assessment of the ICCM in Nigeria. Difference in difference (DID) methodology and logistic regression were made. The period before and after the program, 2013 and 2015, were compared. They considered two control and two intervention areas. Authors found that the chance not to have a fever in the intervention area is 23.5%. However, this study focused especially on the impact of the use of nets while the program is also related to the training of CHWs and to the improvement of accessibility to ACT.

Mubiru et al. (2015) assessed the impact of ICCM program in Uganda. From 2010 to 2012 a pilot project has been implemented in eight districts while three other districts were considered as control districts. Mortality rates in the two groups (control and treated) were compared. The method of DID has been made. The impact on mortality has been identified from the method Lives Saved Tool (LIST)[1]. They found that through access to ACT and Amoxicillin, the under-five mortality rate in the intervention area decreased from 50 to 49 deaths per 1,000 live births. However, in the control zone, this rate increased from 63 to 69 deaths per 1,000 live births.

Concerning the assessment of the impact of the ICCM program before 2014, Amouzou et al. (2014) identified 11 studies. But they considered only 8 because of the poor quality of the 3 others. All these studies used the DID methodology. Among these studies, only one study has shown that ICCM can reduce infant mortality.

3. Methodology

Our study was conducted in two (Andapa and Antalaha) of the four districts of the SAVA region, situated in the Northeast of Madagascar.

3.1. ICCM Program

The program has been set up in February 2014. All program activities were implemented in Antalaha, chosen by MOH and UNICEF as pilot district. In Andapa (control district), only the basic activities, ensuring the survival of the community sites, were carried out, whose oversight of the drug supply chain. .

The target population is children under-five, residing more than 5 km from the nearest health facility.

3.1.1. Basic activities

In February 2014, cascade training was organized. The officials of the Regional Health Office (RHO) and of the District Health Office (DHS) who had been trained by the MOH officials trained the health workers of health facilities from the districts of Antalaha and Andapa, who, in return,

[1] It is a software used to estimate the impacts of maternal and child programs. The user can insert into the tool different information such as demographic details about the country, causes of death by age, the rate of growth, prevalence of Plasmodium falciparum, etc. Then, it builds scenarios. For each scenario, the model produces estimates of deaths avoided and cost estimates.

formed the CHWs on managing malaria and pneumonia cases at community level. Therefore, CHWs training has been preceded by two orientation meetings and team building. The total number of CHWs trained was: 306 in Andapa and 396 in Antalaha.

Then supervisions of the community pharmacies were carried out regularly. The aim is to implement a system to monitor and control the management of drugs in the region to avoid drug stock-outs in the two districts. These supervisions are also used to check whether the revolving mechanism of drugs is respected and to verify the use of funds generated from the sale.

3.1.2. Program activities in Antalaha

Program activities were to provide formative follow-ups, retrain the CHWs; provide tools such as sheets to note all the cases, sheets for the report as well as start-up kits with ARI-timer and two boxes of Amoxicillin-DT 250 mg; strengthen the community mobilization and home visits. In Andapa (control district), only the basic activities, ensuring the survival of the community sites, were carried out, whose oversight of the drug supply chain.

Refresher training is performed after an evaluation of the level of the CHWs' skills compared to the initial training given to them. Dialogue sessions through home visits where CHWs persuade parents about the need to have their children consulted in the event of illness. CHWs are equipped with consulting cards composed of images on the front and messages on the back. Each CHW has ten days to do the home visits.

3.2. Impact analysis: Difference in difference methodology (DID)

In this study, we used DID methodology. The number of cases treated is compared in the following two situations: in which the CHWs benefited from all of the program activities, case of Antalaha (treated group) and in which they received only the core activities ensuring the functionality of their sites, Andapa's case (control group). In order to avoid confusion biases, the introduction of covariates is necessary (Gertler et al., 2010).

The two strategies we compare are therefore the case of Andapa and that of Antalaha. The aim is to determine whether the additional activities have had an impact on the number of cases of malaria and pneumonia treated by CHWs.

3.2.1. Number of observations

Normally, the number of observations and the number of health facilities are the same since CHWs reports are compiled at the health facilities. However, only 15 out of the 28 health facilities of Andapa and 29 out of the 32 Antalaha health facilities provided reports. The control group and the treated group are therefore composed respectively of 15 and 29 health facilities. The others are mainly those suffering from problems of geographical accessibility. For example two health facilities of Antalaha are at four days walk from the last place accessible by motorcycle. The heads of these health facilities rarely come to the DHS.

3.2.2. Model and variables description

We use the method of Card and Krueger (1994). Their study is about the impact of rising wages on the level of employment in fast food in New Jersey. To do this, they compare the situation in New Jersey (treated group) with that in Pennsylvania where there was no wage increase (control group). Here, we compare the number of cases of malaria and pneumonia treated by the CHW in Andapa district with those in Antalaha district.

Let:

[X] is the access to the program. The value of this random variable is 1 for Antalaha and 0 for Andapa.

[Y] represents the effectiveness of the program. It expresses the number of cases of malaria and pneumonia treated by CHWs divided by the number of the target population. This indicator is the equivalent of the consultation rate in the case where the caregiver is a CHW. It should be higher in the case of the treated district than in the case of the control district.

[Y_0] is the number of cases handled by CHWs before the program implementation in t_0. *[Y_1]* is the number of cases treated by CHWs in t_1, period when the population appropriates the program. ΔY represents the change in the number of cases that CHWs have managed between t_1 and t_0.

Tr is the treated group and *C* the control group. DID estimation is:

$\gamma = E(\Delta Y_{it}^{Tr}) - E(\Delta Y_{it}^{C})$, with *E* the effectiveness.

The average effect of the program in Antalaha is:

$\Delta^{TT} Y = E(Y_1 - Y_0 | X = 1)$

To avoid the risk of selection bias, the situation before the program implementation must be the same for the two districts.

Then, the link between results and participation in the program could be explained by other variables. The introduction of covariates can also influence outcomes (Khandker, Koolwal and Samad, 2010). This approach can avoid confusion bias. Therefore, the number of CHWs attached to each health facility *[CHW]*, the distance between each community site and the district to which it is attached *[KM]*, as well as the prevalence of malaria and pneumonia *[Prevalence]* at the level of each municipality of the health facilities are considered.

3.2.3. Source of data about effectiveness

Health data came from the District Health Service (DHS) where the monthly activity reports of the health facilities and those of CHWs are collected. These reports contain information on the number of children in care per month by each health facility and by CHWs. They include, among others the number of fever cases, cases tested by RDT, malaria and pneumonia cases and the number of children referred to health facilities. Monthly meetings are held at health facilities during which CHWs must submit activity reports concerning the health situation at their respective sites.

Health facilities should have all the data concerning CHWs activities. However, some CHWs are not attending the meetings mainly because of the problems of accessibility. Indeed, transportation is not covered by the program, whereas in order to attend meetings, some CHWs have to pay travel fare which is equivalent of 3.5 USD (survey, 2016). Note that for those who practice in very remote sites, carts are the only available means of transportation, so, data are incomplete.

3.3. Cost estimation

As ICCM induces a reorganization of child health care, and may be some constraint for health staff, we decided to include both direct (financial) and indirect (economic) costs.

Financial costs are those related to training, supervision, upgrading, supply and distribution of inputs and outputs in the DHS reports. Also input costs: ARI-timer, medicines and management tools costs are included.

Indirect costs are those related to time. Data come from surveys of each individual responsible of the program. Thus, the technical and financial partners, officials in the MOH, at the RHO, at the DHS of Antalaha and Andapa, at the health facilities and CHWs were interviewed to determine the time spent on the implementation of the program. Different questionnaires[2] were used according to the targeted officials. It is obtained by multiplying the time devoted to the program by the hourly wage.

The total cost is the total expenditure in the districts of Antalaha and Andapa for the period from February 2014, the date of the program implementation, to February 2016, period after the implementation.

[2] Available upon request.

3.4. Efficiency: Cost-effectiveness analysis

Program efficiency is assessed using cost-effectiveness analysis. This is done by comparing the strategies and evaluating the incremental cost for an additional effectiveness (O'Brien et al., 1994). In the studied case, the aim is to verify whether carrying out additional activities in addition to the core activities is expensive or not in comparison to the obtained results. To this end, the case of Andapa is compared, where only the basic activities relating to community health have been carried out with that of Antalaha where all the activities related to the program have been implemented. According to Drummond, Sculpher and Torrance (2005), the reference is the incremental cost-effectiveness ratio (ICER) where the numerator is the difference of the costs between the two strategies, and the denominator the difference between their effectiveness.

$$ICER = \frac{C_2 - C_1}{E_2 - E_1}$$

With:

C1: program costs in Andapa
C2: program costs in Antalaha
E1: intervention effectiveness in Andapa
E2: intervention effeciteveness in Antalaha

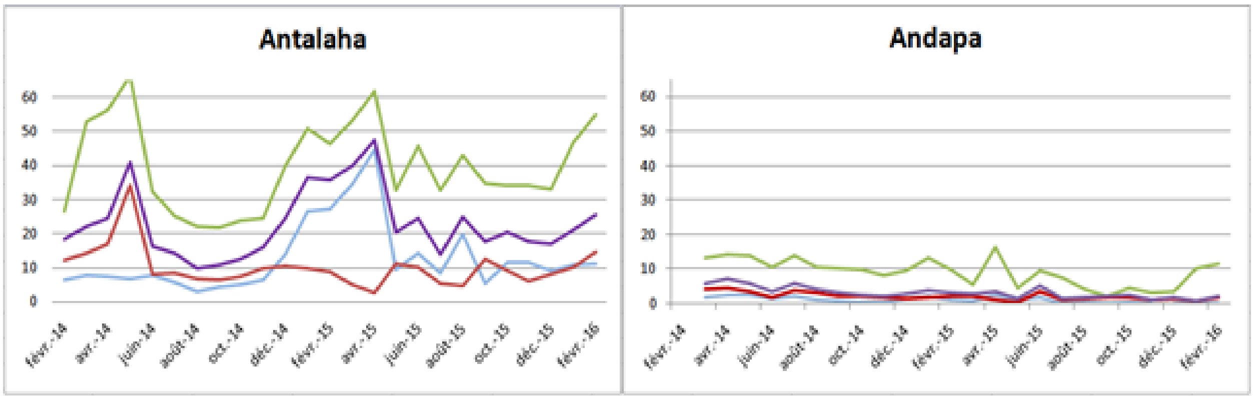
In our case, the effectiveness is the number of additional cases treated by CHWs thank to the new strategy. It is obtained by comparing the number of cases treated by CHWs before the implementation of the program t_0 in January 2014 with that registered in t_1 in February 2016. We did not use a threshold, because of the difficulty to have information about willingness to pay.

4. Results

4.1. Descriptive analysis: Evolution of the number of children managed by CHWs and treated at health facilities in Antalaha and Andapa

In the Figure 1, the x axis is the period (month) and the y-axis is the number of cases divided by the number of target children.

Figure 1: Evolution of the number of children managed by CHWs in Antalaha and Andapa (divided by the number of target children) between February 2014 and February 2016



Source: Authors, from DHS data

: Children managed by CHWs for all cases

: Children with malaria managed by CHWs

: Children with pneumonia managed by CHWs

: Children with malaria and pneumonia managed by CHWs

In Antalaha, the number of children with malaria treated by CHWs in 2015 peaked in February until April, while in 2014 it was not observed. For pneumonia, there was a peak in June 2014 and none in 2015. Regarding all cases managed, there was a peak in April until June 2014, then in January until April 2015 and February 2016. This management curve follows that of malaria and pneumonia (malaria and pneumonia curve in violet).

There are fewer children infected with malaria and pneumonia treated by CHWs in Andapa than in Antalaha. The number of children with malaria treated by the CHWs has been more or less steady from February 2014 to April 2015. A small peak is observed in May 2015, then since June 2015, the proportion of children with malaria has become stable. Moreover, there is no seasonality of pneumonia.

It should be noted that the average number of episodes of malaria and pneumonia is 1 episode per child per year in Antalaha and Andapa (Survey, 2016).

Thanks to immediate care at community level, severe cases received by health facilities should be reduced. Table 2 shows the variation in the number of pneumonia and malaria cases treated at health facilities.

Table 2: Evolution of the number of malaria and pneumonia cases treated at health facilities in February 2014 (t_0) and February 2016 (t_1)

	Malaria		Pneumonia	
	Antalaha	Andapa	Antalaha	Andapa
t0	3.54	1.28	0.13	0.40
t1	2.23	1.10	0.70	0.21
Différence t1-t0	-1.31	-0.17	0.57	-0.19

Source: Authors, from RHO data

In February 2016, the number of malaria cases treated at health facilities in the two districts decreased. This decline is greater for the case of Antalaha than that of Andapa.

Concerning pneumonia, the number of consultations decreased in Andapa but significantly increased in the health facilities of Antalaha.

4.2. Difference between Andapa and Antalaha effectiveness

In the following table (Table 3), model (I) is the results of a simple DID. Model (II) is obtained after the introduction of covariates. In model (III), DID is associated with propensity score matching. The propensity score is the probability for an individual *i* to receive treatment considering his characteristics V_i (Khandker, Koolwal and Samad, 2010). The logit model is as follows: $e(x_i) = P(Z_i = 1 | V_i = v_i)$. The aim is to correct the heterogeneity between the treated and the control groups and to avoid an overestimation of the impact of the program.

Table 3: DID estimations

Outcome		Malaria/target population			Pneumonia/target population		
		(I)	(II)	(III)	(I)	(II)	(III)
T0	Control group	0.20	0.10	0.14	0.46	1.23	0.37
	Treated group	0.44	0.25	0.44	0.82	1.82	0.82
	Difference	0.24	0.15	0.30	0.36	0.59	0.45
		(0.26)	(0.46)	(0.11)	(0.39)	(0.15)	(0.22)
T1	Control group	0.13	-0.02	0.10	0.17	1.08	0.11
	Treated group	0.99	0.63	0.99	1.42	2.23	1.42
	Difference	0.86***	0.65***	0.89***	1.25***	1.15***	1.31***
		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Double difference		0,62**	0.50*	0.59**	0.89	0.56	0.87
		(0,04)	(0.08)	(0.02)	(0.13)	(0.34)	(0.10)
Observations		88	88	88	88	88	88
Covariates	CHW	-	0.00	0.03	-	-0.07***	0.04
			(0.66)	(0.38)		(0.00)	(0.22)
	KM	-	-0.00	0.01*	-	-0.00	0.02*
			(0.79)	(0.08)		(0.23)	(0.07)
	Prevalence	-	0.01***	-0.02		0.02**	-0.02
			(0.01)	(0.71)		(0.03)	(0.31)

*, **, ***: significant respectively at 10%, 5% and 1%

Source: Authors, from DHS data

A significant difference was observed between the number of malaria cases managed by CHWs in Andapa and Antalaha between t_1 and t_0. But the difference is not significant for the case of pneumonia.

4.3. Program costs

The total cost of interventions is twice higher in Antalaha than in Andapa (Table 4). Furthermore, the cost of the program per target child for each of the two scenarios (Andapa and Antalaha) belongs to the cost range estimated by Collins et al. (2014) studying the cost of the same program in seven sub-Saharan Africa countries (Table 1).

Table 4: Total costs and mean costs in USD

Costs	Andapa	Antalaha
Activities	37,418.00	130,347.97
Inputs	71,806.84	114,999.52
Indirect costs	27,447.29	84,971.99
Total	136,672.13	330,319.48
Number of trained CHWs	306	396
Number of target population	39,678	56,458
Costs/CHW	447.71	1,017.4
Costs/target population	3.44	5.85

Source: Authors, 2016

4.4. Incremental cost-effectiveness ratio estimation (ICER)

The program implemented in Antalaha allows the diagnosis and treatment at Community level 76 830 malaria and pneumonia cases in comparison of the number of cases treated in Andapa for an additional cost of 193,647.35 USD. This is equivalent to 2.52 USD per additional malaria or pneumonia case (Table 5).

Table 5: ICER estimation (USD)

	Malaria + pneumonia
C2 – C1	193,647.35
E2 – E1	76,830
ICER	2.52

Source: Authors, from DHS data

For the estimation of efficiency previously, we use the results of DID model (III), when we use those of model (II), the ICER is 3.50 USD and 2.44 USD with the model (I). Therefore, the cost range belongs to (2.44 USD - 3.50 USD).

5. Discussion

The results of the DID estimation show that the difference of the number of cases treated by CHWs in Andapa and Antalaha during t_1 and t_0 is significant for malaria cases and not for pneumonia cases. The increase of the number of pneumonia consultations in Antalaha health facilities can be explained by the fact that CHWs are not adequately trained on the prevention and control of this disease and they do not have the required skills to do this. Indeed, according to the report on formative follow-up of September 2015, 23% of CHWs faced a problem to count respiratory rate and 16% made errors in treatment (DHS Antalaha, 2015).

One of the problems with the program is that some CHWs give Amoxicillin-DT to patient with cough or simple cold (Survey, 2016). Such practices increase resistance to antibiotics and make the use of health facilities inevitable.

However, concerning malaria management, the difference between the number of cases treated by CHWs in Andapa and Antalaha is significant. Therefore, Andapa should receive the same activities as Antalaha. But the program must be reviewed. The incremental cost for an additional efficiency is 2.52 USD: a cost which is not very high. So to ensure the quality of the community case management, additional activities can be implemented. For example, we can increase the number of retraining.

Thanks to the program, household health expenditures can decrease. The program implementation is the responsibility of the MOH or the TFP, so, it is necessary to know their willingness to pay. However, it was difficult to obtain this information. Indeed, the share of the government budget for health is already insufficient (MOH, 2014) (8.06% of the total budget in 2012, 7.10% 1 in 2013 and 9.62% in 2014).

6. Conclusion

In February 2014, MOH and UNICEF implemented a program integrating the diagnosis and treatment of pneumonia into malaria community case management. The objectives of this program were to improve the management of cases of malaria and pneumonia by CHWs to alleviate the problem of accessibility to care and to reduce the number of severe cases treated at health facilities. In this case, CHWs should be able to manage adequately simple malaria and pneumonia cases to win local population trust. To this aim, two districts of the SAVA region were considered: Andapa received only basic activities ensuring the functionality of the community sites and Antalaha where all activities related to the program were implemented. For the analysis, Andapa was taken as the control district and Antalaha as the treated district.

The DID estimation shows that the difference of the number of malaria cases treated by CHWs in Andapa and in Antalaha is significant before and after the program. However, concerning pneumonia cases treated by CHWs, this difference is not significant. Then, it was found that in February 2016, the number of malaria cases treated at health facilities decreased and this decrease was more significant in Antalaha than in Andapa. However, concerning pneumonia, the number of cases treated at health facilities decreased in Andapa and increased significantly in Antalaha. Therefore, skills of CHWs should be strengthened especially concerning pneumonia cases management.

In Antalaha, although the program has no significant impact on pneumonia, the situation is better than that of Andapa, as in the case of malaria management, the difference is significant between the two districts. Our results showed that the costs of this program are within the cost range estimated by Collins et al. (2014) studying the cost of the same program in seven sub-Saharan Africa countries. The cost-effectiveness analysis also demonstrated that the cost per case of additional malaria and pneumonia treated by CHWs is 2.52 USD (2.44-3.50). However, it has been difficult to define a threshold beyond which this intervention will not be cost-effective. But as said by WHO (2003), the priority is to ensure equity and to ensure that everyone has access to care.

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