

Medical citizen outreach programs as Rwanda Defense Force homegrown solution for health challenges in Rwanda

Kayondo King^{1,*}, Bitega Jean Paul¹, Nsengiyumva Boniface², Kayitare Pacifique², Mutamuliza Janvier², Byiringiro Fidele², Umumararungu Esperance², Rukataza Epimaque², Mugenzi Pacifique², Buteera M. Alex², Ngoga Eugene², Jean Chrysostome Kagimbana²

¹Military Medical Insurance, Kigali, Rwanda

²Rwanda Military Hospital, Kigali, Rwanda

ABSTRACT

Introduction: Rwanda Defense Force (RDF) Medical Citizen Outreach Program (COP) is a product of a longterm cordial relationship between the Rwandan population and its army from the early 1990s in the liberation struggle to now. This was part of a long plan of social economic development agenda of the government of national unity to deal with complications of genocide and a very low healthcare provider-to-population ratio and the need to take medical services to the disadvantaged. A yearly intervention has been on, and its effects in uplifting the healthcare of the population are being investigated.

Methods: The data on 1015 patients were collected from 5 sites (Rubavu, Nyanza, Rulindo, Kayonza and Bugesera) on Survivors of 1994 genocide against Tutsi. The specialists from 9 departments of RMH (Internal Medicine, Orthopedics and General Surgery, Dental, Ophthalmology, Dermatology, Ears, Nose and Throat (ENT), Obstetrics and Gynecology, Urology and Clinical Psychology) carried out data collection. This study was an analytical cross-sectional survey. For data analysis, descriptive statistics, bivariate analysis, logistic regression model and proportion test were used.

Result: A total number of 1015 of patients was enrolled with elderly patients (53.7 %) compared to other age categories. This study showed that 60% of treated patients were cured or had their disease recurrent after sometimes. The department of General Surgery and Orthopedics had the highest number of consultations (20.3 %), and Dermatology had the lowest number (2.3 %).

Conclusion: This study showed that being treated or more generally visiting RMH specialized doctors during RDF medical COP permanently or temporally healed genocide survivors. However, further studies regarding the importance of RDF medical COP for the general population and on specific diseases would be an excellent supplement to this study.

*Corresponding author:

Kayondo King, MD, MMed
 Military Medical Insurance
 Kigali
 Rwanda
 Email: kayondoking@yahoo.fr

Received: February 1, 2019

Accepted: March 15, 2019

Published: March 31, 2019

Cite this article as: Kayondo K. et al. Medical citizen outreach programs as Rwanda Defense Force homegrown solution for health challenges in Rwanda. *Rw. Public Health Bul.* 2019; 1(1): 26-30

INTRODUCTION

The idea of Rwanda Defense Force (RDF) medical Citizen Outreach Program (COP); formerly known as Medical Army Week, is a product of the long term cordial relationship between the Rwandan population, Rwanda diaspora and the Army from the early 1990s to today. This relationship was one of the conditions that helped the RDF formerly Rwanda Patriotic Army (RPA) win the war of liberation. In fact, RPA did not understand liberation in a narrow sense of overthrowing a genocidal regime but in a broad sense of socio-economic transformation of Rwanda [1]. Armed struggle was successfully ended and RDF with the total support of the population invested many efforts in sustainable development of Rwanda.

RDF in partnership with other Government Institutions namely the Ministry of Health (MoH), FARG (Assistance funds for genocide survivors), hospitals and local administration has launched the Army Week activities in 2009 [1] for the general population and 2012 for the survivors of the 1994 genocide against Tutsi. Globally 438,371 patients benefitted from specialized healthcare between 2009 and 2018 [2]. Generally medical COP aimed at uplifting the welfare of Rwandans and contributing to national sustainable development.

Specifically, the medical COP is intended to bring multidisciplinary specialized care at the doorsteps of the population in the remotest part of the country.

Potential Conflicts of Interest: No potential conflicts of interest disclosed by all author. **Academic Integrity:** All authors confirm their substantial academic contributions to development of this manuscript as defined by the International Committee of Medical Journal Editors. **Originality:** All authors confirm this manuscript as original piece of work, and has not been published elsewhere. **Review:** All authors allow this manuscript to be peer-reviewed by independent reviewers in a double-blind review process. **© Copyright:** The Author(s). This is an Open Access article distributed under the terms of the Creative Commons Attribution License (CC BY-NC-ND), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited. **Publisher:** Rwanda Health Communication Center, KG 302st., Kigali, Rwanda. Print ISSN: 2663 - 4651; Online ISSN: 2663 - 4653. **Website:** www.rwandapublichealthbulletin.org

These yearly interventions have helped in treating physical and psychological health problems of the Rwandan population and especially the genocide survivors as some of the most vulnerable. This was done in all districts of the country to give a chance to those deprived communities. Every medical COP round includes free or low cost specialized medical services offered to the Rwandan Population. Rwanda Military Hospital (RMH) delivered its various specialized services to low-income population, inaccessible communities living in remote rural areas. Medical COP is a strategy to bridge the gap by removing barriers for people to benefit from specialized medical care. Particularly, Medical COP yearly intervenes in treating mental and physical cases hurting genocide survivors in all districts of the country.

This initiative generally lacks scientific documentation to serve future generation or mostly to be used as a model for other limited resource countries with community health challenges. Therefore, the objective of this study is to investigate the usefulness and document RDF's medical COP for survivors of genocide against Tutsi who faced mental and physical atrocities in 1994 [3].

METHODS

The data were collected from 5 sites (Rubavu, Nyanza, Rulindo, Kayonza and Bugesera) on Survivors of the 1994 genocide against Tutsi. Patients who at least had participated in one of the previous Medical COP were included in this study to investigate the current health conditions with regard to the treatment received. The study included also patients who participated in the previous Medical COP but didn't receive any known treatment due to either personal or medical reasons; and the patients were labeled "Not Treated" during statistical analysis.

Specialists from 9 departments of RMH (Internal Medicine, Orthopedics and General Surgery, Dental, Ophthalmology, Dermatology, Ears, Nose and Throat (ENT), gynecology, Urology and Clinical Psychology) carried out data collection.

Patients who didn't recover and patients with comorbidities received immediate treatment.

There were limited financial resources to allow home to home visits to identify patients who will participate in either one or both activities. 1015 patients were selected from an estimated population of 62134 patients treated during Medical COP from 2012 to 2016, giving a power of 80% [4]. Radio announcements, local and religious communication channels were used to inform genocide survivors who previously participated in medical COP to reiterate the purpose of the survey.

The data were collected using Case Report Form (CRF) after receiving informed consent.

This is an analytical cross-sectional study where data on health conditions of patients treated during previous medical

COP sessions were collected from 5 sites (Nyamasheke, Nyanza, Burera, Bugesera and Kayonza) purposively selected from districts covered by all Medical Army Week sessions between 2012 and 2016.

The main outcome was health status; qualitatively measured according to the health conditions treated during the previous Medical COP.

For data analysis, descriptive summaries and graphs were used to identify significant differences in health status conditions. Further analyses were carried out using bivariate analysis, logistic regression model and proportion test.

The multiple logistic regression was used to investigate the magnitude and direction of the relationship between health status and study covariates. This model was considered to investigate other factors that would be linked with health status related to Medical COP other than treatment. The full model having all study variables was included and contrasted with reduced model containing only significant variables. The backward stepwise regression was used to confine the full model into reduced model. The appropriateness of the model was checked using Hosmer-Lemeshow test. Stata version 13 and SPSS version 23 was used.

RESULTS

The demographic characteristics such as gender, age, Ubudehe category, education level, and residential districts were described using graphs, frequencies and proportions to provide an exploratory view of the population under survey.

A total number of 1015 patients in all sites participated in the study; among them 84% were women and 16 % were men (Table 1).

There was a higher proportion of elderly patients (53.7 %) compared to other age categories and a lower number of young patients (7.3 %) participated in the study. Obese and underweight patients were 6.29 % and 20.2 % respectively compared to normal weight patients 54.77 %. Tobacco Smokers were 3.97 %, drug abuse 0.54 % and patients with multiple sexual partners were 2.53 %.

Most of the patients that participated in this study were widows (47.43 %) belonging to the second category of Ubudehe (41.3 %). The fourth category of Ubudehe was less common among participants (only 0.8 %). Primary education level was most frequent 51.4 %, subsistence farming profession with 69.8 %, and civil servants 1.4 %

The main outcome was health status (Figure 1). It was shown that 60% of treated patients were cured or had their disease recurrent after sometimes. This reflects the effect of previous Medical Army visits.

Table 1. Patients descriptions

Variable	Patients	%
Gender		
Male	159	15.7
Female	856	84.3
Age category		
Young (≤ 35 years)	74	7.3
Adult (≥ 36 years and ≤ 55 years)	381	37.5
Old (≥ 56 years)	545	53.7
Ubudehe category		
Category I	265	26.1
Category II	419	41.3
Category III	311	30.6
Category IV	8	0.8
Education level		
University	17	1.7
Secondary	113	11.1
Vocational Training (TVET)	50	4.9
Primary	522	51.4
None	304	30
Missing	9	0.9
Profession		
Subsistence Farming	708	69.8
Civil servant	14	1.4
Business	24	2.4
Other	260	25.6
Marital Status		
Single	74	7.45
Married	408	41.09
Divorced	10	1.01
Separated	30	3.02
Widowed	471	47.43
Religion		
Catholic	423	43.52
Protestant	356	36.63
Muslim	38	3.91
Other	155	15.95
BMI category		
Underweight	180	20.2
Normal	488	54.77
Overweight	167	18.74
Obese	56	6.29
Smoking Status		
Yes	37	3.97
No	894	96.03
Multiple sexual partners		
Yes	23	2.53
No	887	97.47
Drug Abuse		
Yes	5	0.54
No	913	99.46

The Table 2 shows that the department of General Surgery and Orthopedics had the higher number of consultations (20.3 %), and Dermatology had the lower number (2.3 %) (Table 2).

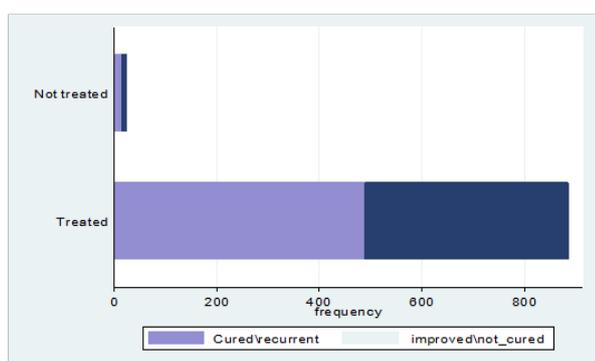


Figure 1. Health status and treatment status

Table 2. Clinical departments and frequent disease treated

Department	Patients	%	Frequent Disease
Internal medicine	178	17.5	Hypertension
General Surgery and Orthopedics	206	20.3	Degenerative Disc Disease
ENT	98	9.7	Allergic rhinitis
Clinical psychology	88	8.7	PTSD
Gynecology	34	3.3	Urogenital Infection
Urology	65	6.4	Benign Prostate Hyperplasia
Ophthalmology	194	19.1	Presbyopia
Dermatology	28	2.8	Keloids
Dental	103	10.1	Periodontitis
Missing	21	2.1	
Total	994	100.0	

Source: Own primary data analysis, 2018

The bivariate analysis of clinical data was guided by the study objective to investigate the usefulness of previous Medical COP. The health status related to the previous treatment in Medical COP was cross-tabulated with other characteristics in relationship between health status and each individual variable.

The significance and magnitude of association was respectively measured by p-value and Cramer's V statistic.

In general, 25.6 % of all patients participated in this study were cured, 33.3 % slightly improved, few of them were not cured (11.1 %), but 30.1% patients had their sickness recurrent.

This health status was associated with age categories (P-value=0.044, Cramer's V= 0.081). It was also associated with clinical department attended by patients - (P-value< 0.001, Cramer's V=0.410); it is therefore reported that the treatment influenced the health status (P-value=0.043, Cramer's V=0.053) (Table 3).

The association between health status after being treated during Medical COP and other covariates was analyzed using a multiple logistic regression model including all covariates (full model). The results in Table 4 show that the reduced model only includes the significant variables (p-value<0.05) sequentially obtained after removing non-significant variables according to the magnitude of their p-values.

It comprised the visited clinical department (at least one department was having a p-value<0.05) and treatment status (p-value=0.041) during the past Medical COP. The goodness-of-fit for the reduced model was tested using Hosmer-Lemeshow test; the model was found to be a good fit (N: 915, Number of group: 9, Hosmer- Lemeshow Chi2 (7): 0.89 and P-value: 0.991).

A special attention was taken for treatment status since it was highly unbalanced in terms of being treated (95 %) or not treated (5%). This was suggesting that the majority of patients who had consultations during Medical COP had been treated (Table 3); meaning that almost all patients were treated or in other words visited a clinical department for treatment.

Table 3. Bivariate relationship between covariates and health status

Variable	Improved/Not cured	Cured/recurrent	P-value	Cramer's V
Gender			0.101	0.053
Male	72	70		
Female	356	466		
Age category			0.044	0.081
Young	21	47		
Adult	157	209		
Old	240	276		
Marital status			0.253	0.075
Single	26	42		
Married	175	208		
Divorced	6	2		
Separated	15	15		
Religion			0.378	0.061
Catholic	229	178		
Protestant	181	158		
Muslim	20	16		
Other	93	56		
Profession			0.33	0.084
Farmer	286	387		
Civil servant	5	7		
Business	7	16		
Other	126	123		
Education			0.196	0.080
University	3	12		
Secondary	41	65		
Vocational Training	24	25		
Primary	229	268		
None	127	163		
Ubudehe category			0.169	0.073
Category I	106	146		
Category II	175	224		
Category III	141	156		
Category IV	1	7		
Clinical Department			<0.001	0.410
Internal medicine	112	66		
Surgery	116	80		
ENT	37	55		
Clinical psychology	22	59		
Gynecology	22	11		
Urology	38	16		
Ophthalmology	58	135		
Dermatology	15	10		
Dental	4	98		
Smoking Status			0.253	-0.038
Yes	12	23		
No	379	481		
Multiple sexual Partners			0.099	0.056
Yes	14	9		
No	371	481		
Treatment Status			0.043	0.067
Not Treated	27	19		
Treated	382	497		
BMI categories			0.699	0.041
Underweight	74	89		
Normal	215	258		
Overweight	75	84		
Obese	28	24		
Drug abuse			0.845	-0.007
Yes	2	3		
No	390	489		

To be more confident of these results and answer the research question about the usefulness of medical COP; we ignored treatment status and other covariates to perform the proportion test on the main outcome. Having the hypothesis that more than 50 % of patients were cured permanently or temporarily (P-value<0.001).

DISCUSSION

The exploratory data analysis showed that the department of general surgery and orthopedics were the most visited. For almost all demographic characteristics without distinction of

disease, the number of patients cured was higher than the number of patients not cured which explains the importance of medical COP for survivors of the 1994 Genocide against Tutsi.

Table 4. logistic regression for health status

Health Status	Full Model			Reduced Model		
	OR	P-value	95% CI	OR	P-value	95% CI
Clinical Department						
Orthopedics and General Surgery	REF					
Surgery	1.34	0.249	0.81 2.22	1.172161	0.463	0.77 1.96
ENT	2.66	0.005	1.34 5.31	2.494666	0.001	1.46 4.27
Clinical psychology	8.47	0.000	2.97 24.17	4.207171	<0.001	2.35 7.54
Gynecology	0.84	0.696	0.35 2.00	0.887489	0.768	0.40 1.96
Urology	1.27	0.618	0.50 3.23	0.853497	0.658	0.42 1.72
Ophthalmology	3.34	0.000	1.94 5.74	3.924476	<0.001	2.52 6.10
Dermatology	0.83	0.696	0.31 2.17	0.980379	0.965	0.41 2.37
Dental	60.30	0.000	17.40 209.02	56.71824	<0.001	17.10 188.17
Gender						
Male	REF					
Female	1.12	0.714	0.61 2.06			
Religion						
Catholic	REF					
Protestant	0.77	0.211	0.52 1.16			
Muslim	0.80	0.686	0.27 2.36			
Other	1.28	0.368	0.75 2.17			
Profession						
Substance farming	REF					
Civil servant	0.64	0.598	0.12 3.37			
Business	2.38	0.132	0.77 7.39			
Other	0.78	0.249	0.52 1.18			
Education						
University						
Secondary	0.43	0.380	0.06 2.86			
Vocational Training (TVET)	0.25	0.185	0.03 1.93			
Primary	0.40	0.343	0.06 2.66			
None	0.50	0.473	0.07 3.37			
Ubudehe Category						
Category I	REF					
Category II	0.74	0.180	0.48 1.15			
Category III	0.77	0.267	0.48 1.23			
Category IV	1.00					
BMI Category						
Underweight						
Normal	0.93	0.774	0.57 1.52			
Overweight	0.87	0.648	0.48 1.59			
Obese	0.45	0.073	0.19 1.08			
Treatment						
Not Treated	REF					
Treated	2.42	0.051	1.00 5.86	2.20	0.041	1.03 4.68
Age Category						
Young	REF					
Adult	0.62	0.321	0.25 1.58			
Old	0.58	0.257	0.23 1.49			
Smoking						
Yes	REF					
No	0.55	0.21	0.22 1.40			
Multiple Sexual Partners						
Yes	REF					
No	2.01	0.189	0.71 5.73			
Drug Abuse						
Yes	REF					
No	1.06	0.956	0.14 7.98			
Intercept	1.18	0.923	0.04 34.10	0.278498	0.002	0.12 0.63

The multivariable analysis showed that the treatment status and clinical department were significantly associated with health status. Having reference category of “General Surgery and Orthopedics” for clinical departments and “Not treated” for treatment status; these variables were associated with the increase in odds of being cured permanently or temporarily. This model fitted well the data according to Hosmer-Lemeshow (P-value=0.741).

Other social economic variables such as Ubudehe category, age category and life-style (Alcohol, drug abuse, and having multiple sexual partners) were not associated

with the increase or decrease of being cured temporally or permanently. This may indicate a predominance of the role of visiting a clinical service for treatment. However, this might partially answer the research question about the usefulness of Medical COP regarded that the treatment was highly unbalanced considering complete cure or failure of cure, All independent variables were ignored and a single proportion test was used, and it was found that more than half of patients were cured permanently or temporally.

It is also important to note that the discussion of results was limited to findings of this study because Medical COP is a national initiative for the treatment of mental and physical conditions resulting from the 1994 Genocide against Tutsi and associated health challenges for the general population hindering sustainable development for Rwanda.

REFERENCES

- [1] Rwanda Development Board (2017). Rwanda Homegrown Solutions and good practices, Government of Rwanda, Kigali, Rwanda
- [2] Rwanda Defense Force-RDF (2018). RDF socially and economically transforming Rwanda. Government of Rwanda, Kigali, Rwanda

In conclusion, visiting clinical services compared to visiting orthopedics and general surgery, and the complete healing versus failure of healing were associated with the increase in odds of permanent or temporary cure. These findings confirmed the importance of Medical COP in treating genocide survivors of the diseases that mostly resulted from the genocide and its direct consequences. Using single proportion test by ignoring all covariates, it was found that more than half of patients were cured permanently or temporally.

The results show that the consultations with RMH specialized doctors during RDF medical COP permanently or temporally cured genocide survivors. Further qualitative surveys are needed to evaluate the importance and extent of RDF medical COP for the general population and for specific diseases.

- [3] Uwamaliya, P. and Grahame S. (2017). Rehabilitation for Survivors of the 1994 Genocide in Rwanda: What Are the Lessons Learned? *Issues in Mental Health Nursing*, 38:4, 361-367.
- [4] Statistical solution (2018). https://www.statisticalsolutions.net/pssZtest_calc.php [Accessed on 23/06/2018]