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SERVICE NATIONAL DES ENDEMIES MAJEURES
EVALUATION DU RESEAU DES COLLABORATEURS VOLONTAIRES EN VUE DE SON RENFORCEMENT, EXTENSION ET DIVERSIFICATION EN HAITI

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I. THE IDEAL

The ideal towards which we strive in public health is the goal that everyone, rich and poor, urban and rural, should enjoy a quality of life that includes the satisfaction of basic needs, access to effective and efficient health care, and a chance for self-fulfillment both spiritually and socially.

II. THE SITUATION IN HAITI

Selected health and population indicators in Table 1 reveal the magnitude of the challenge. With a population in 1985 of close to 6 million, 83% of which is rural, there is tremendous pressure on the land. If the annual rate of growth remains stable at 1.9%, then the population will be close to 8 million by 2000 and will have doubled by 2022. Illiteracy is high, especially among women, and modern contraception is virtually non-existent in rural areas.

Women and children under 5 represent the high risk groups, with the major reported causes of mortality in the latter including first malnutrition, then diarrhea and respiratory infections.

Malaria has been on the increase in recent years with about 10,0000 cases, only half of the estimated number, being reported annually. As many as two-thirds of these cases occur in children under 15.

III. HAITI'S HEALTH SYSTEM

Figure 1 gives a simplified definition of the system, dividing it into 3 major areas: public, private and international. Table 2 presents a calendar of selected pertinent historical events.

The health sector has undergone major changes and activities in the last five years. Some of these include the following:

1. The Ministry of Health and Population (MOHP) has opted for a strategy that defines 6 priority areas to be incrementally attacked and has called for a national demographic policy to be developed.

2. Decentralization of the decision-making processes of the MOHP to the rural areas has begun.

3. An organization has been created (AOPS) to coordinate private organizations working in health with the MOHP.

4. Computers have been introduced into the MOHP.

TABLEAU 1

SANTE ET POPULATION
ESTIMATIONS DE QUELQUES INDICATEURS EN HAITI

POPULATION	5.9 MILLIONS
POPULATION RURALE	83%
ENFANTS 0-4	16%
FEMMES 15-45	24%
FEMMES EN UNION	14%
FEMMES A RISQUE DE GROSSESSE	12%
TAUX BRUT DE NATALITE	36/1000
TAUX BRUT DE MORTALITY	13/1000
TAUX BRUT DE CROISSANCE NATURELLE	2.3%
EMIGRATION	3.3/1000
TAUX ANNUEL DE CROISSANCE	1.9%
TAUX DE MORTALITE INFANTILE	125-150/1000 NAISSANCES VIVANTES
CAS DE MALARIA ENREGISTRES PAR AN	100000
CAUSES DE DECES (0-4 ANS)	
MALNUTRITION	43%
DIARRHEA	23%
PNEUMONIA	17%
ESPERANCE DE VIE	48-54 ANS
ALPHABETISATION	14%
CONTRACEPTION MODERNE (RURALE)	3%

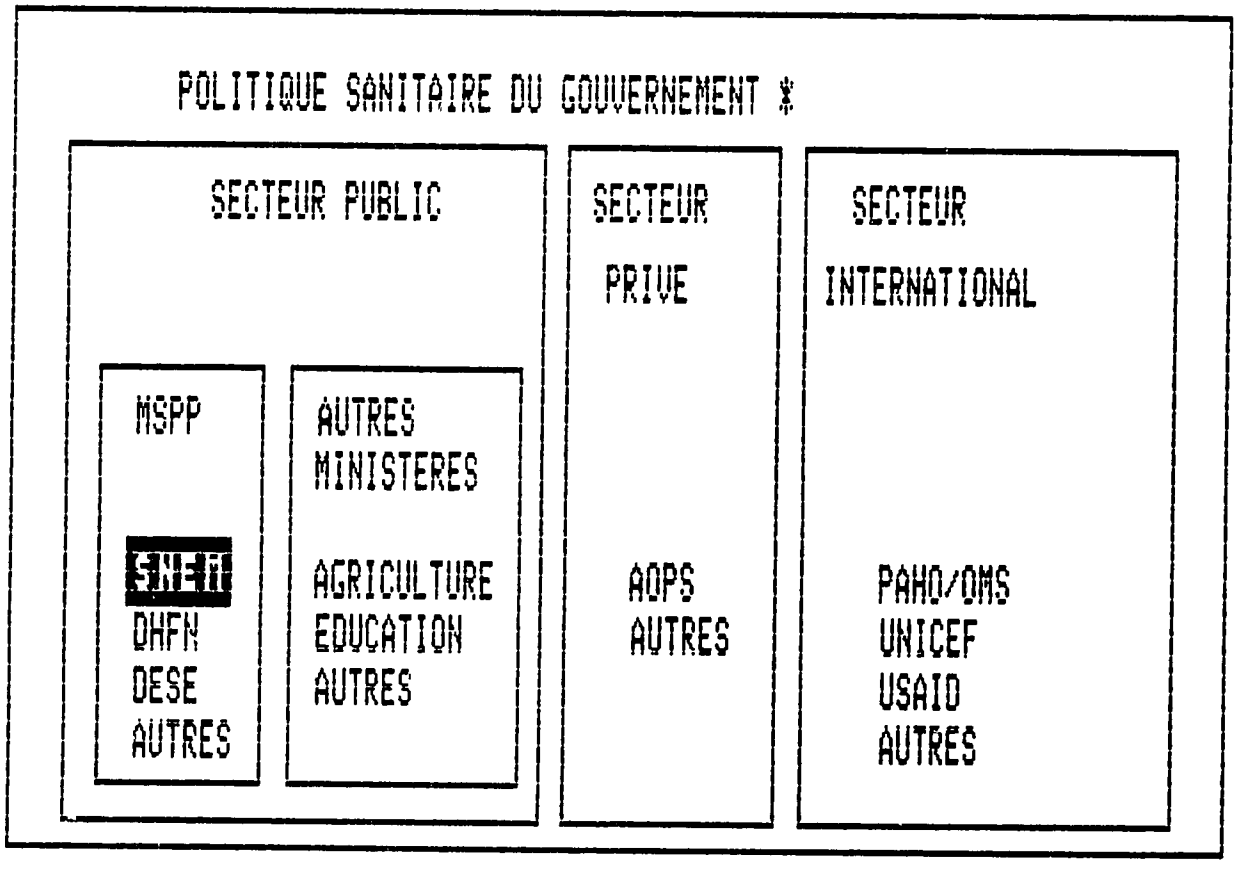
SOURCES:

Haiti: Situation Note on the Population, Health and Nutrition Sectors. World Bank. May 1985.

Courrier de l' AOPS. No. 4 Automne 85.

FIGURE 1

SYSTEME DE SANTE EN HAITI



* PRIORITES

1. MALADIES DIARRHEIQUES
2. PROGRAMME ELARGI DE VACCINATION
3. TUBERCULOSE
4. NUTRITION
5. PROTECTION MATERNELLE ET INFANTILE
   (Y COMPRIS PLANNING FAMILIAL)
6. MALARIA ET AUTRES MALADIES ENDEMIQUES

TABLEAU 2

QUELQUES EVENEMENTS HISTORIQUES RELATIFS A LA SANTE PUBLIQUE EN HAITI

	1958	CREATION DU SERVICE NATIONAL D'ERADICATION DE LA MALARIA
	1962	PREMIERE FORMATION DES COLLABORATEURS VOLONTAIRES
	1973	LE SNEM DEVIENT LE SERVICE NATIONAL DES ENDEMIES MAJEURES
	1974-75	PREMIERS ESSAIS AVEC LES POSTES DE RALLYE
	1976	FORMATION DES AGENTS DE SANTE PAR LA DHF
	1979	CREATION DE LA SECTION D'EDUCATION ET D'ENTRAINEMENT AU SNEM
	1980	EVALUATION DU SNEM PAR L'USAID
	1980	CREATION DE LA DIVISION DE NUTRITION AU DSPP
SEPT	1980	DEMARRAGE DU PROJET PSPSS (PROJET DU SYSTEME DE PRESTATION DE SOINS DE SANTE EN MILIEU RURAL)
	1981	PLAN QUINQUENNAL DE DEVELOPPEMENT DU GOUVERNEMENT D'HAITI
	1982	NOUVELLE ORIENTATION DE LA DSPP (6 PRIORITES)
AVRIL	1982	CREATION DE L'AOPS (ASSOCIATION DES OEUVRES PRIVEES DE SANTE)
SEPT	1982	DEMARRAGE DU PROJET MANAGEMENT DE MALARIA FINANCE PAR L'USAID
SEPT	1982	CREATION DE L'AGAPCO (AGENCE D'APPROVISIONNEMENT DE PHARMACIES COMMUNAUTAIRES)
SEPT	1982	ETUDE DU SECTEUR POPULATION, SANTE ET NUTRITION PAR LA BANQUE MONDIALE
	1983	DEMARRAGE DU PROGRAMME DE DECENTRALISATION AU DSPP
	1983-85	RECHERCHES OPERATIONNELLES A MIRAGOANE CONCERNANT LES COLS VOLS ET LA DISTRIBUTION DES CONTRACEPTIFS
JUIL	1983	DEMARRAGE DU PRONACODIAM (PROGRAMME NATIONAL POUR LE CONTROLE DES MALADIES DIARRHEIQUES ET LA PROMOTION DE L' ALLAITEMENT MATERNEL
	1983	DIRECTION D'EDUCATION POUR LA SANTE CREEE AU DSPP
	1984	LE GOUVERNEMENT OPTE POUR UNE POLITIQUE DEMOGRAPHIQUE
JUIN	1984	REVISION DE LA NOUVELLE ORIENTATION DU DSPP
JAN	1984	CREATION DE LA DHFN
SEPT	1984	EVALUATION DU PROJET MANAGEMENT DE MALARIA
OCT	1984	CREATION DU FONDS POUR LA SURVIE DES ENFANTS PAR LE CONGRES AMERICAIN
OCT	1984	CREATION DE LA DIVISION D'EDUCATION ET D'ENTRAINEMENT AU SNEM
AVRIL	1985	CHANGEMENT DE LA STRUCTURE ORGANISATIONNELLE DU SNEM AFIN DE CORRESPONDRE AUX DISTRICTS DU DSPP
OCT	1985	DEMARRAGE DU PROGRAMME ELARGI DE VACCINATION
NOV	1985	EVALUATION DU PROJET PRONACODIAM

5. Several health projects have been initiated including the strengthening of rural health services, the management of malaria, the creation of community pharmacies, family planning, oral rehydration, and an expanded program on immunization.
6. Several applied research projects have been accomplished.

One of the major constraints always encountered in rural health projects has been how to reach and deliver health services to the people. Thus it is not surprising that the National Service of Major Endemic Diseases (SNEM), with almost 30 years of experience and a total of close to 7,000 village-level "volunteer collaborators" (CVs) working in malaria control, has been identified as a potential major actor in the implementation of the GOH's rural health programs. Consequently it has been suggested that the SNEM develop a work plan to double the number of CVs and train them to handle additional tasks including the distribution of condoms, birth-control pills and oral rehydration packets.

IV. OBJECTIVES OF THIS STUDY

Before it can develop a strategy and action plan for the extension and diversification of its CV network, the SNEM needs answers to a number of basic questions. These include the following:

1. What coverage is provided by the CV network?

   a. How many CVs exist?
   b. Where are they?
   c. Who are they?

2. To what extent does the network function?

   a. What do CVs do?
   b. What are CVs able to do?
   c. What are CVs willing to do?

3. What is the impact of the network on malaria?

   a. How will impact be affected when CVs are diversified?

This mini-study had two major objectives. The first was to demonstrate an approach to the systematic analysis needed for problem definition and the identification of potential solutions to be proposed and field tested. In other words, this was an exercise in the diverse and complicated issues that must be addressed if primary health care is to be effectively translated from theory to practice.

The second objective was the demonstration of the feasibility of doing statistical analysis (from the simple to the complex) on a small lap computer.

V. METHODS

The first step was to do a literature review. Table 3 contains a list of relevant documents found. SNEM data regarding the CV network were also used from the following sources:

1. SNEM Central Office

   a. An analysis of quarterly zone reports from 1984
   b. An annual compilation of rural section forms for 1984
   c. Interviews

2. Two short trips to Zone III (Les Cayes)

   a. Col Vol data for Jan - June 1985
   b. Interviews (including one with a Permanent Campaign Agent (ACP) and one with a CV and his wife)

The analyses were done on a Radio Shack Model 100 with 96K of Random Access Memory, using a spreadsheet and other programs for data entry, manipulation and analysis.

VI. DEFINITIONS

The variables identified and defined are shown in Table 4. Variables 1-14 were entered directly from the data, while 15-28 were derived from the raw data and generated by the computer. The variables were then divided into three major categories: personnel, activities and malaria prevalence. Most of the analyses presented in this report were done at the national and zone levels; however, the same methods could also be repeated at the district and commune levels for more precise answers to our questions.

VII. ANALYSIS

A. Zone Reports

1. National level - Passive Surveillance 1984

(Table 5): A population of 4.8 million lives in over 27,000 localities. A total of 6,591 CVs are identified, 96% of whom work at home. The average HAB/CV ratio is 727, with 22% of localities having at least one CV post. There are 202 supervisors, each one covering an average of 33 CVs.

The annual slide collection rate is 8%. CVs treat 5 febrile patients a month, giving an average of 4 pills per consultation. With a slide positivity rate of 19%, this represents about 1 confirmed case of malaria per CV per month.

TABLEAU 3

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TABLEAU 4

CODIFICATION DES VARIABLES

1.	SR	SECTION RURALE
2.	HAB	HABITANTS (HABITANTS DES AIRES MALARIQUES)
3.	LOC	LOCALITES
4.	LPOS	LOCALITES POSITIVES (AYANT AU MOINS UNE LAME POSITIVE)
5.	CV	COLLABORATEURS VOLONTAIRES
	CIVIL	CV TRAVAILLANT CHEZ EUX
	PM	CV PARA-MEDICAUX (TRAVAILLANT DANS UNE STRUCTURE SANITAIRE)
6.	LOC AVEC CV	LOCALITE AYANT AU MOINS UN POST CV
7.	ACP	AGENT PERMANENT DE CAMPAGNE
8.	LAMES	LAMES COLLECTEES DES CAS FEBRILS TRAITES
9.	LOC ECHANT	LOCALITES ECHANTILLONNEES (PROVENANCE DES MALADES)
10.	TAEH	TAUX ANNUEL D'EXAMEN HEMATOLOGIQUE (%)
		(LAMES / HABITANTS) X 100
11.	COMPR UTIL	COMPRIMES UTILISES (DONNES PAR LES CVS AUX MALADES)
12.	LAMES POS	LAMES POSITIVES (DIAGNOSTIC LABORATOIRE)
13.	ILP	INCIDENCE DE LAMES POSITIVES DES CAS FEBRILS (%) (LAMES POSITIVES/LAMES) X 100
14.	TMA	TAUX DE MORBIDITE ANNUEL POUR 1000 HABITANTS
		(LAMES POSITIVES / HABITANTS) X 1000
		OU
		(ILP X TAEH) / 10
15.	HAB/CV	HABITANTS PAR POST DE CV
16.	% LOC AVEC CV	POURCENTAGE DES LOCALITES AVEC AU MOINS UN POST CV
17.	CV/ACP	CV PAR ACP
18.	LAMES/ CV/MOIS	LAMES COLLECTEES PAR CV PAR MOIS
19.	% LOC ECHANT	POURCENTAGE DES LOCALITES ECHANTILLONNEES
20.	COMPR/ CV/MOIS	COMPRIMES DONNES PAR CV PAR MOIS
21.	COMPR PAR FIEVRE	COMPRIMES DONNES PAR CAS FEBRIL TRAITE
22.	CAS/ CV/MOIS	CAS DE MALARIA TRAITE PAR CV PAR MOIS

23. % LOC POS — POURCENTAGE DES LOCALITES POSITIVES POUR LA MALARIA

24. NE — NIVEAU D'ENDEMICITE

0 = TMA < 20 = BAS
1 = TMA >= 20 = HAUT

25. NTAEH — NIVEAU DE TAEH

1 = TAEH < 12 = BAS
3 = TAEH >= 12 = HAUT

26. TM.TE — TMA COMPARE AVEC TAEH

1 = TMA BAS + TAEH BAS
2 = TMA HAUT + TAEH BAS
3 = TMA BAS + TAEH HAUT
4 = TMA HAUT + TAEH HAUT

27. DENSITE DE COUV — DENSITE DE COUVERTURE

HAB/CV < = 500 = HAUTE
HAB/CV > = 500 = BASSE

28. PREV DE MALARIA — PREVALENCE DE MALARIA (PARMI MALADES FEBRILS)

ILP < 15% = BASSE
ILP >= 15% = HAUTE

TABLEAU 5
SNEM - DEPISTAGE PASSIF
PERSONNEL - 1984

ZONE	HAB	LOC	CV CIVIL	CV PM	CV TOT	HAB/CV	LOC AVEC CV	% LOC AVEC CV	ACP	CV/ACP
I	1500965	6888	1954	81	2035	738	1794	26	53	38
II	1288680	8332	1967	69	2036	633	1688	20	58	35
III	1306264	7784	1622	85	1707	765	1681	22	69	25
IV	697195	4229	754	59	813	858	731	17	22	37
TOTAL	4793095	27233	6297	294	6591	727	5894	22	202	33

ACTIVITIES DES COLS VOLS - 1984

ZONE	LAMES	LAMES/ CV/MOIS	LOC ECHANT	% LOC ECHANT	TAEH %	COMPR/ UTIL	COMPR/ CV/MOIS	COMPR PAR FIEVRE
I	159622	7	4184	61	11	493155	20	3.1
II	90138	4	2537	30	7	387549	16	4.3
III	63530	3	3469	45	5	431885	21	6.8
IV	59323	6	2656	63	9	257175	26	4.3
TOTAL	372613	5	12846	47	8	1569764	20	4.2

PREVALENCE DE MALARIA - 1984

ZONE	LAMES POS	ILP %	CAS/ CV/MOIS	TMA POUR 1000	LOCAL POS	% LOCAL POS
I	20259	13	0.8	13	2502	36
II	13623	15	0.6	11	1681	20
III	20528	32	1.0	16	1980	25
IV	17404	29	1.8	25	1771	42
TOTAL	71814	19	0.9	15	7934	29

SOURCE: SNEM - DIVISION D'EPIDEMIOLOGIE ET DE RECHERCHES

Table 6 is a stratification of the information by zone, variable category and relative level from 1 to 4 (1 being the best and 4 being the worst).

Zone II has the best HAB/CV coverage and Zone III the best ACP/CV coverage. Zone I has the highest level of activities and the lowest level of malaria prevalence, while Zone III is just the opposite with a high ILP and a low TAEH. In our discussions regarding these and following results, we examined hypotheses including errors in certain variables (for example, population) and confounding variables such as distances of CV posts from health facilities, ruggedness of the terrain, and breaks in the stocks of slides and Chloroquine tablets at the CV posts. The conclusions were that the only way to verify what in fact had happened was to go to the field and find out.

2. ZONE III (Jan - Juin 1985)

a. Passive Surveillance (Tables 7-8)

There are 1793 CVs with coverage ratios of HAB/CV of 742 and CV/ACP of 35. The TAEH at 4% is one-half of the national average and 8 pills per consultation are used, twice the national level. A CV only treats one confirmed case of malaria every 3 months.

Stratification of the results indicates that Miragoane has the best CV coverage and Les Cayes the best supervision ratio. Les Cayes also has the highest activity rate and the highest prevalence of malaria.

Since theoretically CVs outside of specified indicator areas are no longer supposed to be collecting blood slides, the origin of the recorded slides is not clear. If, for example, they are just from CVs working in health facilities, then the denominators in derived variables using CVs must be changed from total CVs to para-medical CVs.

b. Active Surveillance (Indicator Areas)

Table 9 presents results from 3 indicator areas in Zone III, where all CVs are supposed to be continuing to take blood slides from all febrile patients treated.

Since indicator areas are by definition to be in areas of high malaria endemicity, two findings need clarification, especially in view of the fact that CV and ACP coverage is relatively good. First, why is the TMA in Miragoane only 0.8 per 1000? Second, why is the TAEH only 3.6% on the average and only 0.7% in Miragoane? Is there in fact little malaria in these areas, due perhaps to spraying or massive drug distribution campaigns or are there other explanations?

TABLEAU 6

SNEM - DEPISTAGE PASSIF - 1984

STRATIFICATION DU RESEAU COL VOL PAR ZONE

CATEGORIE	NIVEAU DESIRABLE*	I	II	III	IV
PERSONNEL					
HAB/CV	BAS	2	1	3	4
CV/ACP	BAS	4	2	1	3
ACTIVITIES					
TAEH	HAUT	1	3	4	2
PREV. DE MALARIA					
ILP	BAS	1	2	4	3

* CODES

1 = LE MEILLEUR
4 = LE PIRE

SOURCE: SNEM
DIVISION D'EPIDEMIOLOGIE ET DE RECHERCHES

TABLEAU 7

ZONE III

SNEM - DEPISTAGE PASSIF
PERSONNEL JAN-JUIN 1985

DIST*	HAB	LOC	CV CIVIL	CV PM	CV TOT	HAB/CV	LOC AVEC CV	% LOC AVEC CV	ACP	CV/ACP
1	199056	1106	323	12	335	594	282	25	10	34
2	753442	4457	998	52	1050	718	973	22	32	33
3	378193	2462	387	21	408	927	349	14	9	45
TOTAL	1330691	8025	1708	85	1793	742	1604	20	51	35

* DISTRICT

1= MIRAGOANE
2= LES CAYES
3= JEREMIE

ACTIVITES DES COLS VOLS JAN-JUIN 1985

DIST	LAMES	LAMES/ CV/MOIS	LOC ECHANT	% LOC ECHANT	TAEH %	COMPR/ UTIL	COMPR/ CV/MOIS	COMPR PAR FIEVRE
1	6176	3	214	19	6	46669	23	7.6
2	14344	2	539	12	14	146012	23	10.2
3	6820	3	311	13	4	33525	14	4.9
TOTAL	27340	3	1064	13	4	226206	21	8.3

PREVALENCE DE MALARIA JAN-JUIN 1985

DIST	LAMES POS	ILP %	CAS/ CV/MOIS	TMA POUR 1000	LOCAL POS	% LOCAL POS
1	156	3	0.1	1.6	48	4
2	3024	21	0.5	8.0	361	8
3	496	7	0.2	2.6	84	3
TOTAL	3676	13	0.3	5.5	493	6

SOURCE: SNEM - BUREAU DE ZONE III - LES CAYES

TABLEAU 8

SNEM - DEPISTAGE PASSIF - 1985

STRATIFICATION DU RESEAU COL VOL PAR DISTRICT*

CATEGORIE	NIVEAU DESIRABLE**	1	2	3
PERSONNEL				
HAB/CV	BAS	1	2	3
CV/ACP	BAS	2	1	3
ACTIVITIES				
TAEH	HAUT	2	1	3
PREV. DE MALARIA				
ILP	BAS	1	3	2

* DISTRICT

1 = MIRAGOANE
2 = LES CAYES
3 = JEREMIE

** CODES

1 = LE MEILLEUR
4 = LE PIRE

SOURCE: SNEM
DIVISION D'EPIDEMIOLOGIE ET DE RECHERCHES

ZONE III

SNEM - AIRES INDICATRICES
PERSONNEL JAN-JUIN 1985

DIST*	HAB	LOC	CV CIVIL	CV PM	CV TOT	HAB/CV	LOC AVEC CV	% LOC AVEC CV	ACP	CV/ACP
1	23781	151	57	0	57	417	42	28	4	14
2	22488	140	56	0	56	402	56	40	4	14
3	17451	100	21	2	23	759	23	23	4	6
TOTAL	63720	391	134	2	136	469	121	31	12	11

* DISTRICT

1= MIRAGOANE
2= LES CAYES
3= JEREMIE

ACTIVITES DES COL VOLS JAN-JUIN 1985

DIST	LAMES	LAMES/ CV/MOIS	LOC ECHANT	% LOC ECHANT	TAEH %
1	86	0.3	30	20	0.7
2	781	2.3	71	51	6.6
3	272	2.0	36	36	3.1
TOTAL	1139	1.4	137	35	3.6

PREVALENCE DE MALARIA JAN-JUIN 1985

DIST	LAMES POS	ILP %	CAS/ CV/MOIS	TMA POUR 1000	LOCAL POS	% LOCAL POS
1	9	10	0.03	0.8	5	3
2	381	49	1.13	33.9	61	44
3	110	40	0.80	12.6	23	23
TOTAL	500	44	0.61	15.7	89	23

SOURCE: SNEM - BUREAU DE ZONE III - LES CAYES

B. Annual Resume of Rural Section Data - 1984

1. The analysis is based on data from 556 rural sections, some of which had missing valves for all or some of the variables. In our discussions, we discovered that the term "rural section" is not precisely defined and may include urban areas. For planning, implementation and evaluation it is important that all branches of government use the same administrative definitions. The SNEM has already replaced the term "sector" by "distict" in order to conform to MOHP geographic definitions.

Table 10.A shows the minimum, maximum and mean values per rural section for selected variables. Every variable shows a tremendous range, for example, rural sections may have as few as 1 CV post or as many as 62. The TAEH varies from 0 to 101%. How can it be over 100%? Is this due to an error in the population estimate? Was the number of slides collected really greater than the population? Or is it just a typing error? The answer should be easy to find out, since the rural section involved is Grand Fond in the Commune of Kenscoff, not far from Port-au-Prince. The rural section with the second highest TAEH (76%) is Grand Lagon in the commune of La Gonave. Here the CV coverage is very high with a HAB/CV of only 55.

Given the asymmetric distribution of the data, the median (middle value) is a better descriptor than the mean or average. The results are thus presented by zone and by median values in Table 10.B.

2. One of the major issues we explored was the question of the degree to which the CV network is functional. In previous analyses it has been said that the system works; however, we found that a definition of "it works" that controls for a variety of variables (both known and unknown) is extremely elusive. For example, the TAEH by itself is an inadequate indicator of CV activity. If a CV post is next door to a health center, it is likely that patients would prefer to be treated by health professionals. Thus the variable "distance" is one that is currently being investigated by the SNEM.

Acknowledging the limitations of our data, we present an analysis in Tables 12-14, which is an attempt to look at how the system functions. As shown in Table 11, two new variables were created.

a. NE - Level of endemicity
TMA < 20% = Low
TMA >= 20% = High

b. NTAEH - Level of TAEH

TAEH < 12% = Low
TAEH > = 20% = High

TABLAEU 10

SNEM - DEPISTAGE PASSIF - 1984

A.

RESUME DES FICHES DES SECTIONS RURALES (N=556)

VARIABLE (PAR SECTION RURALE)	MIN	MAX	MOYENNE
HABITANTS	214	146463	8975
LOCALITES POSITIVES	0	93	16
COLLABORATEURS VOLONTAIRES	1	62	11
TAUX DE MORBIDITE ANNUEL	0	160	14
INDICE DE LAMES POSITIVES	0	60	16
TAUX ANNUEL D'EXAMEN HEMATOLOGIQUE	0	101	11
HABITANT PAR COL VOL	36	9484	931

B.

RESUME ANNUEL DES FICHES DES SECTIONS RURALES
VALEURS MEDIANES

ZONE	N	HAB	LPOS	CV	TMA	ILP	TAEH	H/CV
I	129	9325	19	13	9.9	8.7	12.9	640
II	130	5988	7	10	.6	8.7	6.0	586
III	149	7020	14	10	11.0	22.9	5.7	624
IV	116	4960	12	5	14.0	21.5	8.2	914

SOURCE: SNEM - DIVISION D'EPIDEMIOLGIE ET DE RECHERCHES

TABLEAU 11

SNEM - DEPISTAGE PASSIF
FREQUENCES - 1984
(N=556)

VARIABLE	N	%
TMA POUR 1000		
<20	405	77
>=20	119	23
TAEH POUR 100		
<12	349	66
>=12	179	34

SOURCE; SNEM
DIVISION D'EPIDEMIOLOGIE
ET DE RECHERCHES

According to these definitions, 23% of the rural sections are in high endemic areas and 34% have a high level of TAEH. We can now identify 4 types of rural sections:

1 = TMA Low + TAEH Low
2 = TMA High + TAEH Low
3 = TMA Low + TAEH High
4 = TMA High + TAEH High

The results of this classification are presented in Table 12. To simplify the analysis, the variables are compared in a 2 x 2 table in Table 13. How do the results compare with what we would like to see? For example, if we consider codes 1 and 4 to be appropriate activities, then 76% of the rural sections are functioning satisfactorily. On the other hand, if in the short run we require that the TAEH be high regardless of the level of endemicity, then the relevant codes are 3 and 4, 179/524 or 34% of the rural sections. If we decide that a TAEH level of 12% (1% per month) is too low to be considered a functioning system, then our definitions and analyses will have to be revised accordingly.

For the purposes of this analysis, we considered code 2 (High TMA and Low TAEH) to be evidence of inadequate activites. We see that 33 or 6% of the rural sections fall in this group and it is interesting to note that all them except one are in Zones III and IV (See Table 12). The data and analyses pertaining to this subset are seen in Tables 14-15. Here again we note wide variability in the values, such as HAB/CV ranging from a low of 331 to a high of 1630. Distribution here is also not random, for 7/33 or 22% of the rural sections are in the Sector of St. Raphael in Zone IV. Can this be explained by the nature of the terrain or the placement of health centers, or are there other explanatory variables?

TABLEAU 12

SNEM - DEPISTAGE PASSIF - 1984

RESUME ANNUEL DES FICHES DES SECTIONS RURALES
VALEURS MEDIANES

ZONE 1

CODE*	N	HAB	LPOS	CV	TMA	ILP	TAEH	H/CV
1	56	10873	14	12	7.0	8.8	8.3	901
2	1	12440	28	13	22.3	19.3	11.6	957
3	44	8784	22	17	9.5	6.2	17.1	493
4	28	8000	20	12	26.4	14.3	19.2	652

ZONE II

1	93	6901	7	10	.5	8.7	4.0	723
2	0							
3	36	3883	11	12	1.5	10.2	19.2	214
4	1	2654	4	3	58.4	5.76	101.4	885

ZONE III

1	100	7090	11	9	6.4	17.0	4.3	719
2	15	7190	21	11	21.7	30.6	8.3	585
3	5	5960	8	12	3.7	3.2	12.1	445
4	29	6495	26	14	53.1	31.6	16.6	455

ZONE IV

1	63	5160	8	5	8.0	15.8	5.4	1094
2	17	4430	15	6	29.5	29.0	9.8	774
3	8	2655	12	5	12.1	9.5	14.4	614
4	28	5080	24	8	49.0	27.5	16.7	778

SOURCE: SNEM
DIVISION D'EPIDEMIOLOGIE ET DE RECHERCHES

* CODES
1 = TMA BAS + TAEH BAS
2 = TMA HAUT + TAEH BAS
3 = TMA BAS + TAEH HAUT
4 = TMA HAUT + TAEH HAUT

TABLEAU 13

SNEM - DEPISTAGE PASSIF- 1984

COMPARAISON DU TMA AVEC LE TAEH
(N=524 SECTIONS RURALES)

		TMA		
		BAS	HAUT	TOTAL
TAEH	BAS	CODE=1 312	CODE=2 33	345
	HAUT	CODE=3 93	CODE=4 86	179
	TOTAL	405	119	524

ACTIVITES APPROPRIEES

CODES 1 + 4 = 398/524 = 76%

ACTIVITES INSUFFISANTES

CODES 2 = 33/524 = 6%

AUTRES CAUSES DES FIEVRES?

CODE 3 = 93/524 = 18%

TABLEAU 14

CODIFICATION DES VARIABLES

1. ZONE
2. NOM DE LA SECTION RURALE
3. NUMERO DE LA SECTION RURALE
4. HABITANTS
5. LOCALITES POSITIVES
6. COLLABORATEURS VOLONTAIRES
7. TMA
8. ILP
9. TAEH
10. HABITANTS/ COL VOL

SECTIONS RURALES: TMA HAUT + TAEH BAS (CODE = 2)

C/V	1	2	3	4	5	6	7	8	9	10
001	1	3e. LABADY	233	12440	28	13	22.3	19.3	11.6	956.92
002	3	DESSOURCES	3	7190	26	12	35.2	32.9	10.7	599.17
003	3	FOND DES NEGRES	5	4205	20	10	24.5	28.5	8.6	420.50
004	3	PAILLANT	6	7530	24	13	21.5	28.9	7.4	579.23
005	3	MANICHE	47	6440	20	11	24.7	29.7	8.3	585.45
006	3	DORY	49	7860	20	13	20.7	28.8	7.2	604.62
007	3	BOULIER	51	8270	25	9	30.2	28.1	10.7	918.89
008	3	JAQUIN	71	6000	21	17	20.2	20.3	10.5	352.94
009	3	MOREAU	93	11360	30	9	22.9	33.1	6.9	1262.22
010	3	BEAULIEU	105	8040	26	16	28	33.3	8.4	502.50
011	3	ILET PIERRE	113	4840	15	9	23.3	30.5	7.7	537.78
012	3	BARIADELLE	116	10310	13	15	27.1	38.3	7.1	687.33
013	3	BASSE VOLDROGUE	128	6387	21	13	38.8	46.2	8.4	491.31
014	3	MARFRANC	133	8980	26	10	30.8	30.6	10.1	898
015	3	VARONNA	142	4800	14	10	27.1	37	7.3	480
016	3	LOBY	149	5850	17	8	29.2	45.7	6.4	731.25
017	4	TETE BOURY	285	6110	26	7	24.5	25	9.8	872.86
018	4	BEAUDOIN	291	3160	9	5	22.2	19.8	11.2	632
019	4	LA TROUBLE	302	4330	15	6	26.6	33.5	7.9	721.67
020	4	LA VILLE	303	3440	19	3	27.9	29	9.6	1146.67
021	4	SOUFFRIERE	311	4510	33	3	31	33.6	9.2	1503.33
022	4	CORAIL	316	8150	30	5	28.5	27.7	10.3	1630
023	4	BRAS GAUCHE	320	4430	14	3	22.1	26.7	9.8	1476.67
024	4	GENIFAILLER	333	5300	15	5	24.9	26	9.6	1060
025	4	MORNE PELE	338	10200	21	10	25.5	34.5	7.4	1020
026	4	PTE. ANSE	341	3340	8	6	20.6	20.5	10.1	556.67
027	4	JOLY TROU	381	8550	39	12	29.2	36.9	7.9	712.50
028	4	BOIS FIN	383	9440	48	10	42.2	40.8	10.3	944
029	4	BAILLY BAHON	384	9290	30	12	40.6	42.1	9.6	774.17
030	4	BASSIN CAIMAN	387	2320	13	7	39.7	34.7	11.4	331.43
031	4	LAGONIE	389	1610	7	3	28	28.7	9.8	536.67
032	4	MATHURIN	392	1920	9	4	36.4	39.3	9.2	480
033	4	LA VICTOIRE	397	4150	10	6	31.3	28.4	11	691.67

TABLEAU 15

SNEM - DEPISTAGE PASSIF - 1984

SECT. RURALES: TMA HAUT + TAEH BAS
(N=33)

VARIABLE (PAR SECTION RURALE)	SOMME	MIN	MAX	MEDIANE
HABITANTS	210725	1610	12440	6110
LOCALITES POSITIVES	692	7	48	20
COLLABORATEURS VOLONTAIRES	295	3	17	9
TAUX DE MORBIDITE ANNUEL		20.2	42.2	27.1
INCIDENCE DE LAMES POSITIVES		19.3	46.2	30.5
TAUX ANNUEL D'EXAMEN HEMATOLOGIQUE		6.4	11.6	9.6
HABITANT PAR COL VOL		331	1630	692

SECT. RURALES: TMA HAUT + TAEH BAS
VALEURS MEDIANES (N=33)

ZONE	N	HAB	LPOS	CV	TMA	ILP	TAEH	H/CV
I	1	12440	28	13	22.3	19.3	11.6	957
II	0							
III	15	7190	21	11	27.1	30.6	8.3	585
IV	17	4430	15	6	28.0	29.0	9.8	774

SOURCE: SNEM
DIVISION D'EPIDEMIOLOGIE ET DE RECHERCHES

C. A Model of the CV Network

1. Further Analyses

Having divided our information into the 3 major categories, what can we say about the CV network as a whole? In other words, what is the correlation between the coverage by CVs, the prevalence of malaria and the activities of the CVs? The following is a simplified theoretical model of the system:

PERSONNEL

\+ ===> ACTIVITIES

MALARIA
PREVALENCE

This model assumes that the level of activity of the CVs is dependent on the density of coverage and the prevalence of malaria. Given the available data, we tested this model with two types of multivariate analysis, the details of which are presented in the Annex.

2. Interpretation

a. There is much "noise" and missing information in the data.
b. There is little correlation between the distribution of CVs and the prevalence of malaria as measured by the slide positivity rate of febrile patients. (R= 0.1)
c. As one would expect, there is some inverse correlation between HAB/CV and TAEH. (R= -0.3) In other words, as HAB/CV decreases (i.e. coverage increases) the TAEH level increases.
d. Given our definition of satisfactory activities (TAEH >= 12%), there is a probability of 40% that the average CV is functional. This probability decreases to 21% in rural sections with low coverage (HAB/CV >= 500) and increases to 59% in those with high coverage (HAB/CV < 500).
e. The prevalence of malaria as defined by the ILP is not shown by our data to have any statistically significant effect on the TAEH level.
f. In fact very little of the observed variance in the TAEH is explained by our model. (R^2 = 0.09)
g. Finally, our model is misspecified in two ways. The variables we have used need to be more precisely defined and other important variables need to be identified and included.

VIII. CONCLUSIONS

And what does all this have to do with the question of diversification of the SNEM's Volunteer Collaborator network?

As mentioned in the objectives, this study was an attempt to begin to develop a method to answer some basic questions in order to facilitate the SNEM's increasingly important role in the implementation of the Government of Haiti's rural health programs. We have found some answers, have raised a multitude of questions and have hopefully laid some groundwork for continuing research activities and developing a plan of action.

Major conclusions are these:

1. There is a wealth of experience in rural health in Haiti, certainly far more than indicated in the list of references in Table 3. Much of the literature is in English, however, and has not been readily available to decision makers.

2. The SNEM collects large amounts of data which have been underanalyzed. Some of the definitions used, such as population in malarious areas, localities, and rural sections, need to be better defined and standardized with other branches of the Government.

3. A CV network does exist that can play a more important role in the delivery of rural health services. However, the system is very passive and fragile even vis-a-vis the treatment of malaria, not to mention the addition of other responsibilities to the CV job description. The SNEM has the difficult task of walking the tightrope between those who say the CVs should be increased and diversified as soon as possible and others who insist that the first priority should be the reinforcement of that which exists.

4. In view of the rapid evolution of policies and programs in the MOHP in the recent past, the SNEM needs to receive explicit specification of its new role in Primary Health Care from the MOHP, accompanied by adequate administrative support.

IX. RECOMMENDATIONS FOR A PLAN OF ACTION

1. The SNEM now awaits the presentation of the evaluation of 3 years of applied research in Miragoane (by the DHFN and the operations research team) related to the use of CVs in the distribution of contraceptives. Of particular interest are issues related to CV motivation and management problems including transportation and logistics. Following this meeting, the SNEM may propose additional needed studies and will decide whether the "pilot zone" should be extended beyond the District of Miragoane.

2. The SNEM needs to be computerized. Training should start as soon as possible for use of the Data General 1 which is already available. Additional micro-computers, including some smaller lap models, would be a cost/effective way to decentralize and accelerate data entry, manipulation and analysis. An additional bonus would be the improvement of the quality of data collected in the field.

3. Dialogue needs to be encouraged among all who work for the improvement of rural and poor populations, be they in the health sector or not. Such contacts could take the form of seminar/workshops and national study days on various themes. PRICOR has just published 5 monographs in May 1985, any or all of which could provide the basis of a conference. The following are the titles:

   a. Methods

      Paper 1 - Operations Research Methods: A General Approach in Primary Health Care
      Paper 2 - Cost-Effectiveness Analysis

   b. Issues

      Paper 1 - Community Financing
      Paper 2 - Community Health Workers
      Paper 3 - Community Organization

   The issues papers alone present a total of 31 sets of issues that need to be addressed when examining the role of the community in primary health care.

4. Dr. T. Reubush II, in his consultancy for the SNEM in August, 1985, made 12 specific recommendations pertaining to the selection, training and supervision of CVs and ACPs. These need to be reexamined as the work-plan for 1986 is being finalized. Accompanying the recommendations were 5 documents describing various aspects of the diversification of malaria volunteers in South America, only one of which is in French. For these to be of full use to the SNEM, they should all be translated.

ANNEXE

SNEM - DEPISTAGE PASSIF - 1984
(N=506 SECTIONS RURALES AVEC DONNEES)

A. Question

Quelle est la corrélation entre le réseau de distribution des collaborateurs volontaires, la prévalence de malaria parmi les cas fébrils, et les activités des cols vols?

B. Théorie

Les activités des cols vols dépendent de la densité de couverture du réseau des cols vols et du niveau de prévalence de malaria. Autrement dit, les activités sont une fonction de la présence du personnel et de la malaria:

$A = f(P,M)$

C. Spécification Opérationnelle de la théorie

Définition des variables

1. TAEH = Activités
2. HAB/CV = Densité du réseau des cols vo's
3. ILP = Prévalence de malaria

D. Hypothèses

1. Il y a une corrélation inverse entre les variables TAEH et HAB/CV.

2. Il y a une corrélation positive entre le TAEH et le niveau de ILP.

E. Analyses Statistiques

1. Statistiques Descriptives

VARIABLE	MIN	MAX	MOYENNE
TAEH	0	76.3	10.2
HAB/CV	35	9484	925
ILP	0	60.3	15.9

2. Corrélations

VARIABLE	TAEH	HAB/CV	ILP
TAEH	1		
HAB/CV	-0.303	1	
ILP	-0.063	0.109	1

3. Analyse de Régression

a. Modèle

$TAEH = B_0+B_1(HAB/CV)+B_2(ILP)+ERREUR$

b. Hypothèse Nulle

Tous les coefficients égalent zéro.

$B_1=B_2=0$

c. Résultats de l'analyse

1. Valeurs Estimées

B_0 = 13.1
B_1 = -0.003
B_2 (Pas significativement différent de zéro)

TAEH = 13.1 - 0.003(HAB/CV)

2. R^2 = 0.09

9% de la variance est expliquée par le modèle

4. Analyse des données catégoriques avec Moindres Carrés Pondérés (Weighted Least Squares)

Description de la Méthode: Forthofer, R. and Lehnen R. Public Program Analysis: A New Categorical Data Approach. Lifetime Learning Publications, Belmont, California, 1981.

a. Division de chaque variable en 2 catégories

1. Densité de couverture des cols vols

HAB/CV < 500 = Haute densité
HAB/CV >= 500 = Basse densité

2. Prévalence de malaria parmi les cas fébrils

ILP < 15% = Basse prévalence
ILP >= 15% = Haute prévalence

3. Un col vol est fonctionnel

TAEH < 12% = Non
TAEH >= 12% = Oui

b. Probabilités de fonctionnement des cols vols dans 4 situations

1. Basse prévalence et basse couverture
2. Basse prévalence et haute couverture
3. Haute prévalence et basse couverture
4. Haute prévalence et haute couverture

c. Les Proportions Observées

	TAEH	< 12%		>=12%		TOTAL
ILP %	HAB/CV	N	PROP	N	PROP	
< 15	>=500	144	= .8	36	= .2	180
< 15	< 500	37	= .385	59	= .615	96
>=15	>=500	136	= .791	36	= .209	172
>=15	<500	26	= .441	33	= .559	59
TOTAL						507

d. Modèle

$TAEH = B_0+B_1(HAB/CV)+B_2(ILP)+ERREUR$

B_0 = Proportion moyenne de cols vols fonctionnels
B_1 = Effet de densité de couverture
B_2 = Effet de prévalence de malaria

e. Hypothèse Nulle

Tous les coefficients égalent zéro

$B_1=B_2=0$

f. Résultats de l'analyse

1. Valeurs estimées

B_0 = 0.40
B_1 = -0.194
B_2 (Pas significativement différent de zéro)

2. Interprétation
   a. La probabilité moyenne qu'un col vol est fonctionnel, quelque soit la densité de couverture est de 40%.
   b. Si la couverture est haute (HAB/CV < 500) la probabilité de fonctionnement est augmentée de 19% pour atteindre 59%.
   c. Si la couverture est basse (HAB/CV >= 500) la probabilité de fonctionnement est diminuée de 19% pour atteindre 21%.
   d. La prévalence de malaria n'a pas d'effet sur la probabilité de fonctionnement des cols vols.

F. Conclusions

1. Il y a beaucoup de "bruits" et lacunes dans les données.
2. Selon notre définition de fonctionnement (TAEH >= 12%), 40% des cols vols sont fonctionnels. Ce pourcentage varie entre 21% et 59% dans les sections rurales de basse et de haute densité de couverture.
3. Très peu de la variance observée (9%) est expliquée par notre modèle.
4. Il y a donc des variables mal définies et manquantes dans le modèle.
5. Ces analyses ont soulevés plusieures questions auxquelles nous devrions répondre dans nos futures recherches.