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Food Security Assessment in Households in the Ruashi-Lubumbashi Health Zone/ Democratic Republic of the Congo

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ABSTRACT:

A cross-sectional descriptive study was carried out in 426 households selected by a cluster survey, of the probabilistic type, at one level in the Ruashi Health Zone in Lubumbashi in Haut Katanga, on the assessment of household food security in December. 2019 to September 2020. The primary objective of this research was to contribute to improving the state of health of the population of this health zone. The interview and the observation of the environment allowed us to obtain the results and to have a general overview of the situation.

The results of this study showed that 59% of households are food insecure, including 10% in severe situation and 49% in moderate insecurity. Upstream action is of great importance in preventing the prevalence of cases of food insecurity in this Zone. A starving population could not produce goods and services for its nation.

Key-words: Food security, Health zone, Ruashi, household, assessment

RESUME :

Une étude descriptive transversale a été menée dans 426 ménages sélectionnés par un sondage en grappe, du type probabiliste, à un seul degré dans la Zone de Santé Ruashi à Lubumbashi dans le Haut Katanga, sur l'évaluation de la sécurité alimentaire des ménages de décembre 2019 à Septembre 2020. Cette recherche avait comme objectif primordial de contribuer à l'amélioration de l'état de santé de la population de cette zone de santé. L'interview et l'observation du milieu, nous ont permis d'obtenir les résultats et d'avoir un aperçu global sur la situation.

Les résultats de cette étude ont montré que 59% des ménages sont en insécurité alimentaire dont 10% en situation sévère et 49% en insécurité modérée. L'agissement en amont se voit d'une grande importance dans la prévention de la prévalence des cas d'insécurité alimentaire dans cette Zone. Une population affamée ne pourrait produire les biens et services à sa nation.

Mots- clés : Sécurité alimentaire, Zone de santé, Ruashi, ménage, évaluation

1. INTRODUCTION

Food is humanity's first basic need and food security should be seen as a global public good.

Beyond their particular interests, all countries agree that food security is essential for peace and security. [1] Food security depends on agriculture, but also on employment and income. It is no longer just a rural issue but also an urban issue. In recent years, there has been a dramatic return to food security issues with the rise in the prices of basic foodstuffs. [2]

It is now accepted that sustainable food policies must be based, no longer on an exclusively supply-oriented approach, the classic "food-first" method, but rather on the "supply-access-use" triad.

Food security is achieved when all people, at all times, have economic, social and physical access to sufficient, safe and nutritious food that meets their nutritional needs and food preferences Worldwide, more than 820 million people suffer still hunger, which underlines the immense challenge of achieving the Zero Hunger goal by 2030. [3]

The 2030 Agenda recognizes that food insecurity is about more than hunger. The 'Zero Hunger' goal not only aims to 'end hunger', but also to 'ensure that by 2030 everyone, especially the poor and those in vulnerable situations, including infants, have access to healthy, nutritious and sufficient food all year round. [3]

In Africa, between 15% and 30% of adults are chronically undernourished, and up to 50% of children have low birth weight. [4]

Hunger is on the rise again in almost all sub-regions of Africa, which is the region with the highest prevalence of undernourishment, reaching almost 20 percent. [3]

In the DRC, most households live in precarious conditions, in an environment characterized by a severe economic crisis. 70% of the population is affected by food insecurity despite being a country with high agricultural potential. [5]

According to integrated food security and nutrition analyzes carried out in October 2011, the Congolese population in food crisis was estimated at 4.5 million (or 6% of the total population), spread over 38 territories. [6]

In the province of Haut Katanga, malnutrition is a real household problem in both urban and rural areas. The main causes are said to be, in particular, limited access to food, low food availability, low household purchasing power, and the advanced deterioration of transport routes [6]

The city of Lubumbashi and its hinterland including within it the Rwashi health zone are not spared by this multifaceted food security issue, including the occurrence of covid 19 and poor governance. This study aims to assess the current state of food security in the study area by identifying the various causes that affect food security and the means of adaptation to food insecurity.

2. ENVIRONMENT AND METHOD

2.1. Research environment

The research was carried out in households in different health areas of the Ruashi Health Zone located in the city of Lubumbashi. Its surface area is 120km². The total population of responsibility is 547,159 inhabitants, i.e. a density of 4,560 inhabitants / km2.

It is a rural urban area with a tropical climate characterized by the alternation of two seasons, the rainy season and the dry season, and endangered forest vegetation. [7]

2.2. Type, population and study period

We conducted a cross-sectional descriptive study.

The survey concerned the households selected in the health areas. The heads of households and the women of these households were subjected to the pre-established questionnaire during the period of time from December 2019 to September 2020. That is 10 months.

II.3. Sampling We proceeded by a cluster sampling, of the probability type, with a single stage.

The sample size was 426 households drawn from the 19 health areas of the Ruashi health zone. This sample size was calculated from Daniel Schwartz's formula [8] as follows:

n = □Z2 (p). (1-p) . DEFF□ / d2 □ □ (1.96) 2 (0.15) (1-0.15) (2) □ / (0.05) 2 □□ (0.5) (0.85) (2) □ / 0.0025 = 0.969 / 0.0025 = 387.6 +38.76 (10% non-respondents) = 426 households.

Where: n = sample size

Z = parameter related to the risk of error,

Z = 1.96 for a risk of error of 5% (0.05);

p = Prevalence of the problem (15%) or 0.15;

DEFF = Cluster effect (2 for this kind of study);

d = margin of error 5% (0.05) and 10% of non-respondents

3. RESULTS AND DISCUSSION

3.1. RESULTS

3.1.1. Sociodemographic data

Table I. Distribution of heads of household by sex

Gender	Frequency	Percent
Male	340	80
Female	86	20
Total	**426**	**100**

This table states that 80% of heads of household were male

Table II. Distribution of households according to the number of people in the household

Nomber of people in the household	frequency	Percent
[2 - 3]	53	12
[4 – 5]	95	22
[6 - 7]	131	31
[8 - 9]	94	22
[10 - 11]	33	8
[≥ 12]	20	5
Total	**426**	**100**

Average: 7 people (MS Excel calculations)

31% of households comprised 6-7 people, with an average of seven (7) people

3.1.2. Food information (nutritional datas)

Table III. Distribution of households according to whether they have the food supply

Presence of food supplies in the household	Frequency	Percent
No	280	66
Yes	146	34
Total	**426**	**100**

This table shows that 66% of households do not have food provisions.

Figure 1 shows us that 49% of households eat twice a day and 4% had eaten nothing the day before the survey.

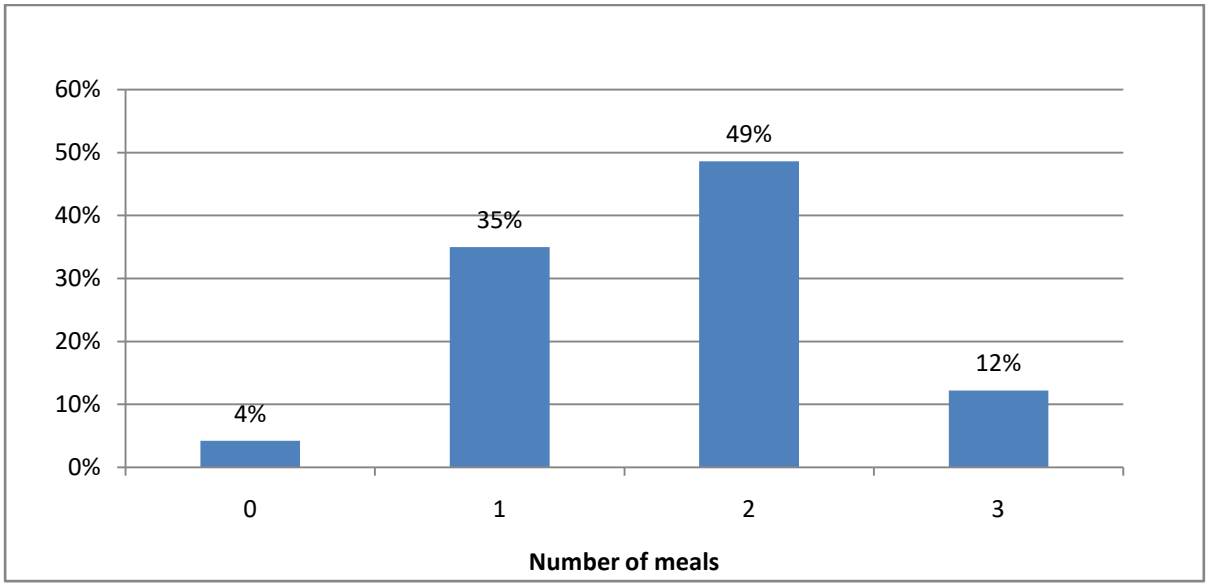

Figure1. Distribution of households according to the number of times of food intake per day

In view of graph 2 below, 97.7% of households buy the food they eat

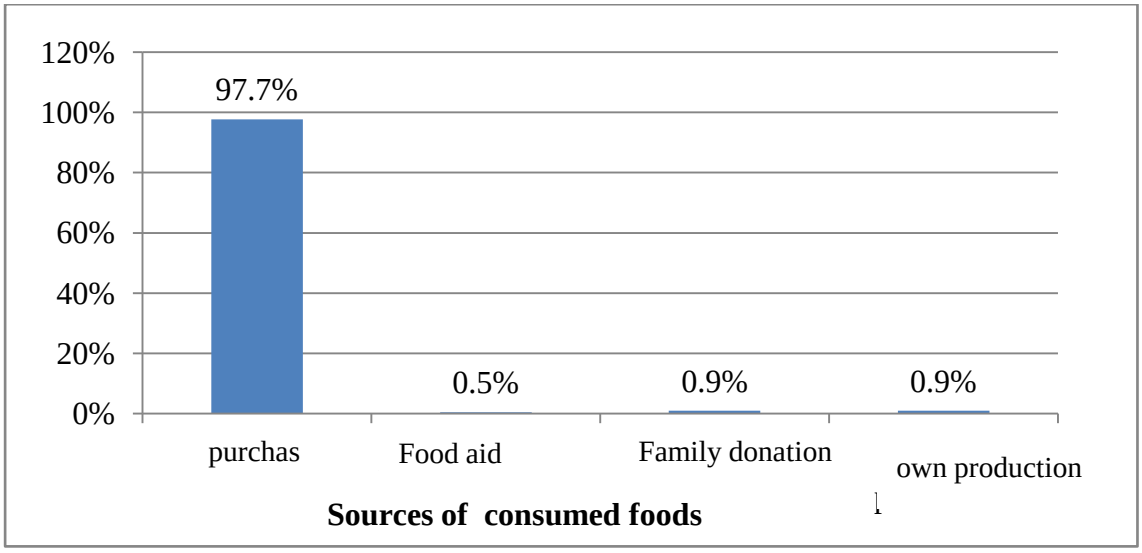

Figure2. Distribution by source of food consumed by households

Table IV. Distribution of households according to market attendance over the last

Number of times the market is visited	Frequency	Percent
1	25	5,9
2	11	2,6
3	47	11,0
4	3	0,7
5	23	5,4
6	1	0,2
7	316	74,2
Total	**426**	**100,0**

Average: 6 times (MS Excel calculations)

This table shows the situation according to which 74.2% of households frequent the market every day (7 days a week). And the average attendance is 6 times.

Table V. Distribution of households according to food ration and food purchased at the market

Food ration and food purchased from the market	Frequency	Percent
Corn flour, horse mackerel, cassava leaves, vegetable oil	264	62
Fry, cabbage, corn flour, vegetable oil	104	24
Meat, fish, corn flour, cabbage, okra, vegetable oil, spices	58	14
Total	**426**	**100**

The table indicates that 62% of households had a ration consisting of corn flour, horse mackerel, cassava leaf, vegetable oil.

Table VI. Number of days each food group is consumed during the last 7 days (summary).

N°	Food groups	Overall frequency of consumption for 7 days (N)	Overall average for 426 households (X)%	% of overall weekly consumption
1	Cereals	2787	6,5	93
2	White roots and tubers	661	1,6	22
3	Vegetables of all types and green leaves	2430	5,7	81
4	Fruits all types	319	0,7	11
5	Meat and offal	393	0,9	13
6	Eggs	470	1,1	16
7	Fish	1480	3,5	50
8	Legumes, nuts and seeds	600	1,4	20
9	Milk and dairy products	413	1,0	14
10	Oils and grease	2947	6,3	91
11	Sweets	1743	4,1	58
12	Spices, condiments	2947	5,9	85

Or:

□ N = □ of weekly consumption frequencies

□ X = N / 426; 426: Sample

□% consumption = X * 100 / 7days

This table shows that cereals were consumed at 93% followed by oils and fats at 91%, spices and condiments at 85%, vegetables of all types (81%), sweets (58%), fish (50%), roots and

tubers (22), eggs (16), milk and dairy products (14%), meat and offal (13%), fruits of all types (11%).

Table VII. Distribution of households according to monetary expenditure linked to the daily food ration per individual

Daily ration in USD / person	Frequency	Percent
<1$	332	77,9
=1$	88	20,7
>1$	6	1,4
Total	**426**	**100,0**

Average: $ 0.77

This table shows that 77.9% of people in households consume less than one US dollar per day.

Table VIII. Distribution of households according to food crisis adaptation strategies

Strategies	Frequency	Percent
Recourse to savings	47	11
Help request	135	32
Sleeping hungry	43	10
Borrow money	15	4
Carry out small jobs (contracts) with third parties for a fee	112	26
Sale of some property of the house	74	17
Total	**426**	**100**

This table shows that 32% of households resort to the request for assistance followed by those who resort to small jobs (contracts) with third parties for a remuneration (26%). 10% sleep hungry.

Figure 3 below states that 70% of households said they did not have access to adequate food

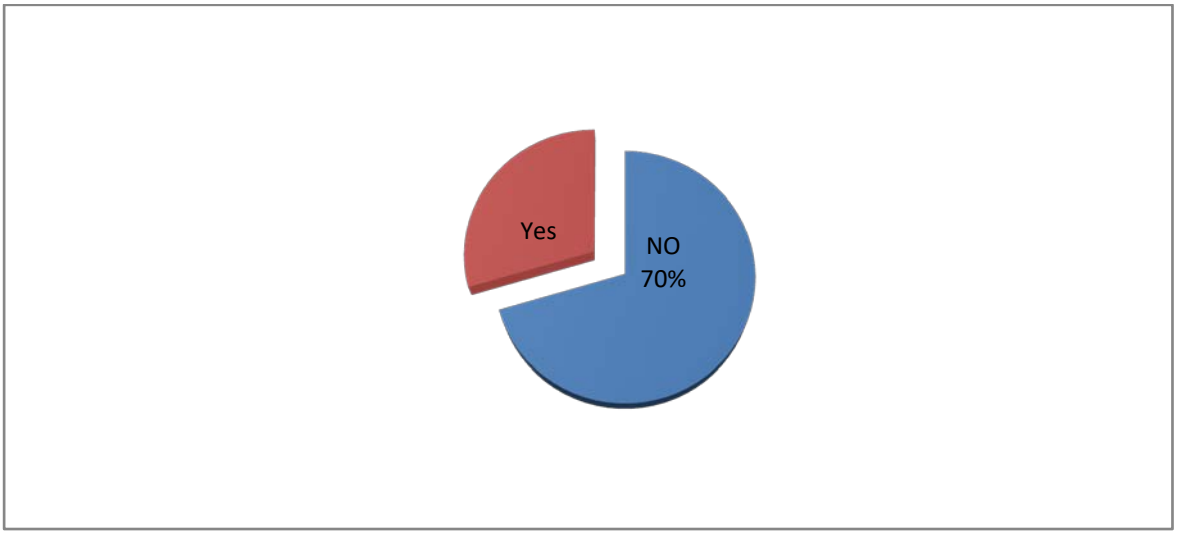

Figure3. Distribution of households according to whether they have access to adequate food

Table IX. Distribution of households according to the Food Diversity Score (SCDA)

SCDA (24hours)	Frequency	Percent
Low [1- 5]	185	43,4
Medium [6 - 8]	236	55,4
High [9 - 12]	5	1,2
Total	**426**	**100**

Households had an average and low dietary diversity score, respectively in 55.4% and 43.4% of cases.

Table X. Classification of households according to the food consumption score (SCA)

Food consumption score	Frequency	Percent
Acceptable	241	57
Limited	185	43
Total	**426**	**100**

This table shows that 57% of households had an acceptable food consumption score and 43% a limited score.

Table XI. Classification of households according to the survival strategy index (CSI)

CSI	Frequency	Percent
High	272	64
Average	121	28
Limited	33	8
Total général	**426**	**100**

It can be seen from this table that 64% of households had a high survival index and 28% of households had an average survival index.

Table XII. Combinations of household food security indicators

Food security classes	Severe food insecurity (%)	Moderate food insecurity (%)	Food security (%)	Total(%)
Indicators				
CSI	24	40	36	**100**
SCA	0	43	57	**100**
SCDAM	6	65	29	**100**
Cumulative total	**30**	**148**	**122**	**300**
Grand total	**10**	**49**	**41**	**100**

Table XIII. Distribution of households according to the causes of food insecurity

Cause of household food crisis	Frequency	Percent
Low income	4	0,9
Ignorance of cause	51	12,0
The Covid pandemic 19	117	27,5
Lack of well-paid jobs	156	36,6
Bad governance	93	21,8
Salary reduction	5	1,2
Total	**426**	**100,0**

This table indicates that the lack of jobs is the cause of food insecurity in 156 cases or 36.6%, followed by the Covid 19 pandemic in 117 cases or 27.5% and 93 cases or 21.8% in bad governance.

3.1.2. Bivariate analysis

Table XIV. Association between the gender of the head of household and accessibility to healthy and satisfactory food

	Accessibility to healthy and satisfying food		
SEX	**Yes**	**No**	**Total**
Male	104	236	340
Row %	30,59 %	69,41 %	100,00 %
Col %	82,54 %	78,67 %	79,81 %
Feminine	22	64	86
Row %	25,58 %	74,42 %	100,00 %
Col %	17,46 %	21,33 %	20,19 %
Total	**126**	**300**	**426**
Row %	**29,58 %**	**70,42 %**	**100,00 %**
Col %	**100,00 %**	**100,00 %**	**100,00 %**

test statistic	Chi-square	1-tailed p	2-tailed p
Chi-square - corrected (Yates)	0,6032		0,4373629944

In our study, there was no statistically significant relationship between the gender of the household head and accessibility to a healthy and satisfying diet (p = 0.437).

Table XV. Association between market attendance and the presence of food supplies in the household

Number of times of market visits * presence of food supplies in the household

Number of times you visit the market	No	Yes	Total
1	2	23	**25**
2	0	11	**11**
3	13	34	**47**
4	2	1	**3**
5	8	15	**23**
6	1	0	**1**
7	254	62	**316**

Total	**280**	**146**	**426**

Chi-square	df	Probability
128,732	6	0,0000

It emerges from this table that the association between the number of times the market is visited and the presence of provisions in the household is statistically significant at p = 0.000.

Table XVI. Association between the existence of provisions and accessibility to healthy and satisfactory food

Accessibility by the household to a healthy and satisfactory diet			
Presence of provisions	**No**	**Yes**	**Total**
No	258	22	280
Row %	92,14%	7,86%	100,00%
Col %	86,00%	17,46%	65,73%
Yes	42	104	146
Row %	28,77%	71,23%	100,00%
Col %	14,00%	82,54%	34,27%
Total	300	126	426
Row %	70,42%	29,58%	100,00%
Col %	100,00%	100,00%	100,00%

test statistic	Chi-square	1-tailed p	2-tailed p
Chi-square - corrected (Yates)	182,0137		0,000

This table shows that there is a statistically significant relationship between accessibility to good nutrition and the presence of provisions in the household (p = 0.000)

This table shows that 59% of households are food insecure, including 10% in severe situation and 49% in moderate insecurity.

3.2. DISCUSSION

Our study on household food security in Ruashi Health Zone revealed that 80% of household heads were male (Table I). This male predominance was noted in a study carried out in Katanga province in 2014 which indicated that 83% of households were headed by men. [9] This is justified by the fact that Congolese culture dictates that men are always considered the head of the household. When the household is headed by a woman, she is either widowed or divorced or she is single.

31% of households include 6 to 7 people, i.e. on average 7 people (Table II). This result is similar to that found in a study in Katanga which showed that the average household size in Katanga was 6.6. [9] In black Africa, children constitute the wealth, the more the number is important the more one hopes to benefit from an assured old age.

Table III relating to the distribution of households according to whether they have food provisions indicates that 66% of households do not have food provisions. This is justified by the precariousness of financial means and the difficulty of keeping fresh perishable food due to the irregularity in the supply of electrical energy and the quality of the latter. The lack of supplies in the household leads households to reduce the frequency of daily consumption and adopt more complex coping strategies that push them into food insecurity.

The results of our study indicate that 49% of households eat twice a day, 35% of households eat only once a day, only 12% of households eat 3 times a day and 4% did not eat anything during the day. precede the survey (Figure 1). The same reality was detected in a study carried out by CFSVA in Katanga indicating the number of meals on average is 2.0. [9] The lack of provisions and adequate sources of supply would justify this state of affairs.

Our study indicates that 97.7% of households have as a source of origin of food consumed the purchase on the market (Figure 2). These results indicate the same trend as those found in Chad, showing that 87% of the food consumed over the period considered was purchased on the markets [10]; on the other hand, the survey carried out in Katanga showed that 50.9% of household food consumption was purchased. [8] As the population grows, the need becomes greater than the supply. In addition, due to the lack of autonomous production and the non-functioning of an adequate agricultural credit system, almost all food is bought at the market.

The results of our investigations indicate that 74.2% of households frequent the market every day (7 days a week). The average attendance is 6 times in a week (Table IV). The food rations purchased consist in 66% of cases of corn flour, horse mackerel (imported fish), cassava leaves and vegetable oil (Tables V and VI). The lack of food supplies could be the reason. The food purchased corresponds to the eating habits acquired and the low purse of the housewife (Table VII).

Households consumed more energy foods (Table VI); With cereals consumed at 93% and tubers at 22%, this trend could be explained by the fact that these foods constitute the basis of the diet in this environment. Oils and fats (91%), spices and condiments (85%) and sweets (58%), are also consumed a lot.

The other food groups were eaten moderately, yet they are the nutrients needed to build and protect tissues and cells. Fish were consumed at 50%, eggs (16%), milk and dairy products (14%), meats and offal (13%). These animal products are important sources of protein. Fruits accounted for a low percentage of consumption (11%). Together with vegetables they constitute an important source of vitamins and minerals, necessary for tissue protection and strengthening of the immune capacity in the fight against the development of various diseases, infections. [11]

Table VII shows that the average person consumes $ 0.77 per day. These results are consistent with those found in a study in Kipushi in 2015 indicating that daily consumption per person in monetary terms varied between $ 0.47 and $ 0.63. [12]

Compared to the strategies for adapting to food crises, Table VIII shows that 32% of households resort to the request for assistance followed by those who resort to odd jobs (washing, weeding, plowing, etc.) from third parties in return for payment. (26%). Our results are consistent with those found by WFP in Chad indicating that most households in this region rely on help from relatives / friends and / or spend their savings and possessions to meet immediate food needs. Most households, out of solidarity and familiarity, help each other to cope with food crises in the community. [10]

70% of households said they did not have access to adequate food (Figure 3). The lack of well-paid jobs is believed to be the main cause of food insecurity (36.6%), followed by the Covid 19 pandemic with 27.5% (Table XIII) According to the report published by the World Bank in 2019, the unemployment rate was 70% in DR Congo.

Households had an average and low dietary diversity score, respectively in 55.4% and 43.4% of cases (Table IX). Our results are similar to those found in the study by Damien and Nkulu in Tanganyika province, which indicated medium and low diversity of 60 and 50% (Damien et al, 2019); this low diversity is explained by the lack of sufficient financial means to allow food diversification in the daily ration.

For the Food Consumption Score (SCA), 43.4% of households had limited food consumption (Table X). Our results align with those found in a 2010 Multiple Indicator Cluster Survey (MICS) which indicated that 57.8% of people living in DRC have poor or limited food consumption. This could be explained by the lack of diversified food crops and vegetable gardens as observed in figure 2 which indicates that only 0.9% of households have their own production.

The results of Table XI showed that 64% of households had a high Strategic Survival Index (CSI); An in-depth food security and vulnerability analysis (CFSVA) conducted in DRC, indicated that the survival strategy index in Katanga, South Kivu, Maniema, Province Orientale, and Kasai Oriental was higher the national average. [8] (WFP, 2014). This indicator measures the stress experienced by the household in relation to access to food, the higher it is, the more the household is in food deficit.

70% of households said they did not have access to adequate food (Figure 3). The lack of well-paid jobs is believed to be the main cause of food insecurity (36.6%), followed by the Covid 19 pandemic with 27.5% (Table XIII) According to the report published by the World Bank in 2019, the unemployment rate was 70% in DR Congo.

59% of households are food insecure in the Ruashi health zone, including 10% in severe situation and 49% in moderate insecurity (Table XII). Our results are slightly better than those found in an in-depth Food Security and Vulnerability Analysis (CFSVA) conducted in the DRC in 2014, which showed that 57% of households in Katanga were food insecure.

The results of our study do not indicate a statistically significant relationship between the gender of the head of household and accessibility to a healthy and satisfactory diet ($p = 0.437$). (Table XIV); this disproves common claims that households headed by women are more likely to be food insecure than those headed by men.

Table XV shows that the association between the number of times the market is visited and the presence of provisions in the household is statistically significant at $p = 0.000$. The reality is that households without provisions in the household more frequent the market to obtain food.

The study showed that there is a statistically significant relationship between accessibility to good nutrition and the presence of provisions in the household ($p = 0.000$) (Table XVI). We have found that households without adequate provisions have a feeding problem, because when food prices fluctuate in the market, accessibility becomes limited.

CONCLUSION

We conducted a cross-sectional descriptive study on the assessment of household food security in the Ruashi Health Zone. A survey was carried out in 19 health areas in 426 households.

At the end of the study, the conclusions are as follows:

- 59% of households were food insecure, including 10% in severe situation and 49% in moderate insecurity. The household dietary diversity score was medium and low, respectively in 55.4% and 43.4% of cases. 77.9% of people in households lived on less than $ 1 per day per person, an average of $ 0.77 per day.
- The average household size was 7 people; with a limited food consumption score in 43.4%. The coping strategies index was high in 64% of households. Food crisis adaptation strategies were not sustainable, 32% of households resort to asking for help. 36.6% of the causes of food insecurity were due to lack of well-paid employment.

- Cereals are the most consumed food group in 93% of households, followed by oils and fats 91%, spices and condiments at 85%, vegetables of all types (81%); other food groups are consumed moderately: sweets (58%), fish (50%), and consumed little: tubers (22%), eggs (16%), milk and dairy products (14%) , meat and offal (13%), fruits of all types (11%).

Given the scale of the problem, we believe that household food insecurity in Ruashi Health Zone is a public health problem.

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