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研究課題名(和文) Participatory, Social Transformational Community Health Action for Prevention of Malaria and Communicable Diseases in Democratic Republic of Congo

研究課題名(英文) Participatory, Social Transformational Community Health Action for Prevention of Malaria and Communicable Diseases in Democratic Republic of Congo

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研究成果の概要(和文)：この研究では、625家族のうち少なくとも93%以上の家族で過去6か月間に1人マラリア感染者がいた。マラリア対策教育と衛生アクションを組み合わせることで、マラリアのリスクが下がった。若者のHIV調査とHIV検査から、低教育と文化がHIVリスクと関係性があり、エイズ対策プログラムはこれらのリスク要因を対象とすべきであると考えられる。また、医療従事者493人に対する病院での調査では、73.4%が血液感染症の予防について訓練を受けておらず、過去12か月間に38.6%の参加者が針刺事故を発生している。緊急事態への準備に関する適切なトレーニングは、病院の労働安全を改善するであろう。

研究成果の学術的意義や社会的意義

Findings from this research showed high household malaria incidence; low income, family size and poor sanitation were associated risk factors. A community anti-malaria education combined with sanitation action reduced malaria risk. Also, HIV risk and HIV infection were associated with faith.

研究成果の概要(英文)：We observed a high household malaria incidence (over 90% of household reporting at least 1 malaria case in previous 6-month period); low income, family size and poor sanitation were associated risk factors. A 6-month community anti-malaria education in schools and churches combined with sanitation action could reduce malaria risk. In youth HIV survey and testing, we found that high HIV risk behaviors and HIV infection were associated with education level and faith group, suggesting that anti-HIV/AIDS programs should target those risk factors. Hospital-based surveys of 493 healthcare workers showed that 73.4% (362/493) of them have not been trained on blood-borne infection prevention, accidental injury occurred in 38.6% of participants in previous 12-month period and 59.2% witnessed blood or other body fluid (BBF) splash. Proper training for capacity-building in emergency preparedness would improve work safety in Congolese hospitals.

研究分野：Public health

キーワード：Communicable disease Malaria prevention Malaria incidence Rapid diagnostic test HIV testing HIV prevalence Educational intervention Sanitation intervention

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**KAKEN/JSPS RESEARCH No17H04675 PERFORMANCE REPORT 2020**

**< Participatory, Social Transformational Community Health Action for the Prevention of Malaria and Communicable viral Diseases in Congo DRC >**

**31 March 2020**

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**I. Preamble and objectives**

Malaria remains the number one cause of morbidity and mortality in the sub-Saharan Africa. Understanding local factors that contribute to malaria endemicity in African countries and finding novel strategies for efficient malaria prevention in communities can help to control this disease. In this research project, our pilot malaria survey (*Ngatu et al., Malaria journal 2019*) and interventional study dealt with those two preoccupations.

Human immunodeficiency virus (HIV)-associated acquired immunodeficiency syndrome (AIDS) has become one of the leading causes of deaths everyday. It is well-known that the sub-Saharan Africa (SSA) remains the most affected region with millions of people affected and dying annually. Recent report from UNAIDS suggests that 1.8 million adolescents are living with HIV in SSA (UNAIDS, 2019; Dzah et al., 2019) and, worldwide, about 510,000 young people (10-24 years of age) were newly infected in 2018 by HIV, of whom 190,000 were adolescents. About 5,000 young individuals are reported to get newly infected daily, that is almost 2 million new infections occurring annually (UNAIDS, 2019).

Knowledge, attitudes and practices (KAPs) regarding HIV/AIDS is believed to be one of the corner stones in the fight against STIs, HIV/AIDS in particular. Our previous pilot study conducted among Congolese and Asian youth showed a higher rate of Congolese young people lacking knowledge on high risk behaviors for HIV infection compared to Asians (Ngatu et al., 2012). Considering the vulnerability of youth to HIV, it is necessary to conduct KAP surveys among teenagers, a population that currently neglected in HIV prevention policies, and carry out a prospective study on HIV in Congolese teenagers.

Recently, complex emergencies related to communicable viral infection outbreaks (viral hepatitis, Ebola, Chikungunya virus disease) have been occurring in Africa, particularly in Congo, and healthcare workers (HCWs) often bear the heaviest burden as they are the first to respond to those outbreaks. Assessing work safety conditions in healthcare settings in Congo and providing necessity knowledge, skills and equipment to protect HCWs' lives was the focus of the third study of this research project.

## II. Communicable Diseases Surveys in Communities, DR Congo

### 2.1 HIV/AIDS KAP (knowledge, attitudes and practices) surveys

In 2019, we continued the Community HIV/AIDS Surveys that started in 2018, as well as anti-HIV/AIDS education campaigns. In total, 3,869 young people were surveyed in schools, universities and other community settings (training centers, churches, etc.) between July 2018 and September 2019. A database was created and statistical analyses performed.

### 2.2 HIV/AIDS Epidemiological Study at Voluntary Counseling and Testing Centers (VCT)

Our local research team worked in collaboration with the HIV testing centers. A prospective epidemiological study was conducted in 5 referral hospitals located in 3 provinces of DR Congo: Kinshasa, Kongo Central province and Katanga province.

### 2.3. Objectives and hypothesis of the study

**Table 1.** Characteristics of study participants (community surveys)

Characteristics		Teenagers [n (%)]	Older subjects [n (%)]	N
Gender	Male	769 (49.4)	787 (50.6)	1,556
	Female	1,374 (59.4)	939 (40.6)	2,313
	Total	2,143	1,726	3,869
Occupation				
	High school student	2,131 (99.4)	1,457 (84.4)	3,588
	University student	4 (0.2)	94 (5.5)	98
	Teacher/professor	4 (0.2)	41 (2.4)	45
	Others	4 (0.2)	96 (5.6)	100
Use of social media				
	Yes	681 (39.7)	1,036 (60.3)	1,717
	No	1,144 (53.4)	998 (46.6)	2,142
Faith/religious community				
	Conventional Christianity (catholic, protestant)	852 (53.9)	729 (46.1)	1,581
	Liberal Christianity/spiritual group	1,230 (59.8)	827 (40.2)	2,057
	Islam	9 (30)	21 (70)	30
	Unificationist group	21 (15.9)	111 (84.1)	132
	No religion	31 (44.9)	38 (55.1)	69
<b>Total</b>		2,143 (55.4)	1,726 (44.6)	3,869

The aim of this study was to assess the knowledge, attitudes and practices of teenagers on HIV sexual transmission, and sociodemographic and cultural factors associated with HIV infection, and determine HIV prevalence among youth that undergo HIV testing at VCT centers. We hypothesized that Congolese teenagers will have inappropriate knowledge on major high-risk behaviors/factors for HIV/AIDS.

### 2.4. Main findings

**(a)** HIV/AIDS-related knowledge, attitudes and practices of teenagers, and trend of self-reported positive HIV test rate.

Of the 3,869 individuals surveyed, 1,556 males (40.21%) and 2,313 (59.78%) females. The majority of participants were teenagers (15-19 years of age), 55.39% (n=2,143) and high school students, 92.74 % (n=3,588). Mean age was 18.3 ± 5.2 years. A lower proportion of participants used social media, 44.38% (n=1,717), and most participants belonged in the faith group that included liberal Christians and believers in spiritual churches, 53.16% (n=2,057) (**Table 1**). Figure

1 shows the HIV/AIDS knowledge level of participants. We considered 6 high risk behaviors for HIV infection to evaluate their knowledge. It was observed that almost half of participants did not have appropriate knowledge about those 6 risky behaviors, with a higher proportion of teenagers (58%) lacking appropriate knowledge (vs. 47.3% in older participants) (Fig.1). Regarding self-reported HIV testing during community surveys, overall rate of HIV+ participants was 11.07% (123/1,111); it was 10.7% (49/409) in teenagers and 11.33% in older participants).

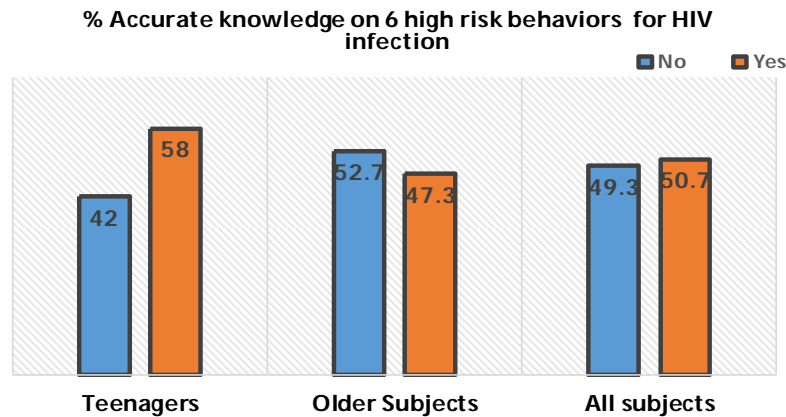


Fig. 1- Proportion of participants with accurate knowledge on high risk behaviors for HIV infection.

(b) Prevalence of HIV positive tests in volunteers tested at VCT centers in 2018:

Regarding HIV testing at VCT centers, a total of 506 volunteers were tested of whom 302 (59.68%) were females (vs. 204 males; 40.32%); 95 (18.77%) were younger (< 18 years), whereas 411 (82.23%) were 18 years or older. Figure 2 shows the prevalence positive HIV tests among volunteer subjects who got tested at participating VCT centers in Kinshasa and Kongo central province in 2018. Overall HIV+ prevalence was 2.77% (2.97% in females, 2.46% in males, 3.16% in younger participants and 2.68% in older ones (Fig. 2).

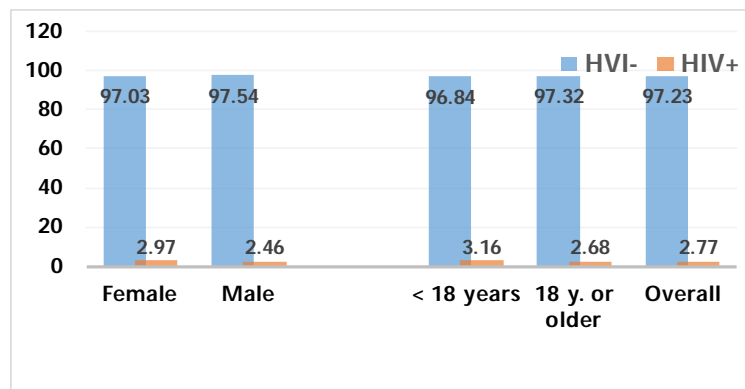


Fig.2- Prevalence of positive HIV tests among volunteers tested at VCT centers in 2018

## 2.5. Presentations in conferences

- (a) Ngatu NR et al. Prevalence and socio-cultural factors associated with HIV infection among Congolese teenagers. IPP/Japan conference, Tokyo, 7 Dec. 2019.
- (b) Ngatu et al. HIV knowledge, attitudes and associated among Congolese school children. AFMED Medical Congress 2019, University of Kinshasa, DRC, 5 Nov. 2019.

## III. Hospital-based Study on Occupational safety for Healthcare Workers

### 3.1. Study sites and Hospital-based Surveys

Four referral health settings have been selected in two different provinces, Haut-Katanga in southern region of DR Congo and Kongo Central (Masa and Kasangulu referral hospitals). Pathogens transmissible through blood or other biological fluids during an occupational exposure represent a threat for hospital staff. During an epidemic, they are at risk of exposure, and this is a major concern, especially in developing countries. A total of 493 healthcare workers (nurses, medical laboratory technicians) took part in the surveys. A data base was created and statistical analyses were performed. First analysis performed showed that, of the 493 participants, there were 60.9% (300/493) of female participants and 39.1% (193/493) males. Participation by province was as follows: Haut-Katanga province, 79.5% (392/493), Kongo Central Province, 20.5% (101/493). Mean age of participants is 32.6 +/- 9.4 years.

Overall 69.5% (342/493) of the participants have not received education of the risk and prevention of occupational exposure to blood and other body fluids (BBF) and related consequences, whereas 73.4% (362/493) have not been trained on 'Universal Precautions' for the prevention of occupationally-acquired blood-borne infections. Regarding exposure to accidental injury at workplace, 38.6% of participants sustained at least one needlestick injury (NSI) event in the previous 12-month period, 13% sustained injury by sharp injury (SI) through medical device and 59.2% witnessed blood or other body fluid (BBF) splash occurring in previous 12 months. In addition, many participants reported two to three types exposures; 62.1% of those reporting NSI have also had BBF event, and 67.2% of those reporting SI also had BBF event.

## IV. Publications

1. Ngatu NR, Kanbara S, Renzaho A et al. Environmental and sociodemographic factors associated with household malaria burden in the Congo. *Malaria Journal* 2019; 18: 53.

2. Ngatu NR, Kanbara S, Muzembo BA et al. Rapid Diagnostic Test (HRP2/pLDH) Positivity, Household Malaria Incidence and Impact of Community Participatory WASH Action in Kongo Central, DR Congo: Mixed methods study (under peer review, prints online).

Available at: [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=3559625](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3559625)

\* The first paper related to our Congo Malaria research was published by Malaria journal (BMC group) and the second paper (**reference 2**) is currently under review and its abstract published online; 2 other papers related to Community HIV/AIDS Survey & Testing, and Hospital-based study on Prevention of occupational viral communicable diseases are currently being written and will be submitted to a peer-review journals.

## References

1. Dzah SM, Karkang EE, Lutala PM. Knowledge, attitudes and practices regarding HIV/AIDS among senior high school students in Sekondi-Takoradi metropolis, Ghana. *Afr J Prim Health Care Fam Med.* 2019; 11(1): 1875.

2. UNAIDS. HIV/AIDS report 2019. Available at:

[https://www.unaids.org/sites/default/files/media\\_asset/2019-UNAIDS-data\\_en.pdf](https://www.unaids.org/sites/default/files/media_asset/2019-UNAIDS-data_en.pdf)

3. Ngatu NR, Hirota R, Eitoku M et al. Perception of the risk of sexual transmission of HIV among Congolese and Japanese university students. *Environ Health Prev Med.* 2012 Mar; 17(2): 139–146.

5. 主な発表論文等

〔雑誌論文〕 計1件（うち査読付論文 1件/うち国際共著 1件/うちオープンアクセス 1件）

1. 著者名 Ngatu NR, Kanbara S, Renzaho A et al.	4. 巻 18
2. 論文標題 Environmental and sociodemographic factors associated with household malaria burden in the Congo	5. 発行年 2019年
3. 雑誌名 Malaria Journal	6. 最初と最後の頁 53-62
掲載論文のDOI（デジタルオブジェクト識別子） 10.1186/s12936-019-2679-0	査読の有無 有
オープンアクセス オープンアクセスとしている（また、その予定である）	国際共著 該当する

〔学会発表〕 計4件（うち招待講演 4件/うち国際学会 1件）

1. 発表者名 Ngatu R. Nlandu
2. 発表標題 Environmental and sociodemographic factors associated with Household malaria in Congo
3. 学会等名 Annual conference of International University of Health and Welfare（招待講演）
4. 発表年 2018年

1. 発表者名 Ngatu R. Nlandu
2. 発表標題 Socioeconomic determinants of Malaria in Congo
3. 学会等名 World Social Science Conference, Fukokuoka 2018（招待講演）（国際学会）
4. 発表年 2018年

1. 発表者名 Ngatu R. Nlandu
2. 発表標題 Household Malaria Burden in Democratic Republic of Congo
3. 学会等名 West Japan Conference of Japanese Association of International Health (JAIH)（招待講演）
4. 発表年 2019年

1. 発表者名 Ngatu Nlandu
2. 発表標題 Congo Malaria Project 2017
3. 学会等名 Kochi Prefectural University Corporation Annual Research Meeting (招待講演)
4. 発表年 2018年

〔図書〕 計0件

〔産業財産権〕

〔その他〕

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6. 研究組織

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