Original Research Article

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Medical laboratory professional's week in Rwanda: a field report from the Simbi and Maraba communities

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ABSTRACT

Background: In response to the need for interventions that facilitate the accessibility of medical services in poor communities, an outreach activity was organized in semi-rural areas of Maraba and Simbi sectors located in Huye district, Southern province of Rwanda. The outreach was undertaken by health sciences students and involved the screening of hypertension, risk of diabetes, hepatitis, anemia, eye disease, and HIV.

Methods: Clinical assessments and rapid laboratory diagnostic assays were used to screen invited residents from the two selected communities. An observation research was conducted from May 21 to 25 May, 2018, at Maraba and Simbi sector located in Huye district, Southern province, Rwanda. We employed a purposively sampling technique for participants' recruitment in the outreach. The outreach was conducted as part teaching program and community engagement, and was endorsed by college of medicine and health sciences and all the subjects voluntarily participated in this exercise; the ethical approval was not applicable for this outreach activity.

Results: The total beneficiaries from those sectors were 1427 citizens of whom females predominated at 72%. During the screening, hypertension was found to be high at 47.8% among adults. Anemia which mostly presumes iron deficiency was observed at 32.5% among under 15 years old children and at 15% in pregnant women. The vision impairment and cataract were observed at 5.66 and 19.59%, respectively. The assessed viral infection indicated a rate of 0.56% for HIV, 1.03% for HBV, and 7.17% for HCV. High blood glucose was found in 10.4% of the screened population.

Conclusions: The findings highlight a high burden of non-communicable diseases (NCDs) in rural communities and call for further investigations and interventions to align with the sustainable development goals (SDGs), particularly access to affordable health services. Furthermore, the success of this outreach highlights the potential contribution of health care trainees in achieving these goals and calls for integration of such interventions in the health education curriculum.

Keywords: Laboratory professional week, Outreach, Diagnostics

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INTRODUCTION

Many low and middle-income countries (LMICs) are struggling to improve the deliverance of medical services in the community. The most critical issue is establishing a healthcare system in which the citizens from rural areas could easily afford to access. In those countries, the limitations arise from many factors, including the geographic accessibility, availability, quality, financial accessibility, and acceptability of the services. However, in developed countries, like in the United States of America, medical students have shown a strong impact in solving the burdens faced by the community.

Apart from infectious diseases documented in some areas of the developing countries, there is also a considerable burden of non-infectious conditions that can be easily diagnosed and screened in low and middle-income countries through the help of medical students. Moreover, that hand could support the early detection of alarming rise in trends of diseases countrywide, which could lead to a substantial reduction and sustainable control of those diseases. 6-8

Although there are strong measures to promote Rwanda's health care system including the community-based health insurance scheme (Mutuweli) and increasing health care facilities, techniques to improve the system are computationally demanding. 9,10

Each year, the university of Rwanda and other private institutions in Rwanda, including institut d'Enséignement Supérieur de Ruhengeri (INES), produce more than a thousand graduates in health sciences (medical doctors and allied health professionals). However, although community service is part of the university's core mandates, little is known about health sciences students' contributions. This outreach was conducted not only to assess the effectiveness of integrating health sciences' students in the delivery of medical services, but also to evaluate the burden of infectious and non-infectious diseases of public health importance in a rural setting.

METHODS

Before medical outreach, the literature review facilitated the evaluation of potential health needs in the community that could be addressed by health sciences students. Moreover, a meeting was arranged between the organizing committee, world vision Rwanda and supporting committees at different levels in HUYE district including local leaders of MARABA and SIMBI sectors, head of health centers, youth coordinators, and community health workers from both sites. This was to ensure a successful mobilization campaign and good turn up of all segments of the community.

The citizens from Maraba and Simbi sectors were invited to attend the outreach program. Pre-school and school-

aged children, as well as pregnant women were screened for anemia. In addition, the general population (including pregnant women) was screened for communicable diseases like human immunodeficiency virus (HIV), hepatitis C virus (HCV) and hepatitis B virus (HBV); as well as non-communicable diseases like hyperglycemia, hypertension, and sight disorders. Most importantly, the team of health sciences students and health professionals spent time (awareness campaign) educating the population on preventive measures of such diseases.

For blood analysis, a sample was collected in ethylene diaminetetracetic acids (EDTA) tubes, and based on the categories mentioned above, blood glucose level was measured using point of care testing (POT), rapid tests of HIV, HCV, and HBV were performed, and hemocue was used to measure hemoglobin level. The blood pressure machine was used to measure blood pressure, and also, ophthalmoscopy was used to identify cataract and distance vision screening for the uncorrected visual impairments. Data were analyzed and presented in the figure using Microsoft excel.

RESULTS

The total beneficiaries were 1427 participants from both Simbi and Maraba sectors. The majority accounting for 72% were female, and 28% were male. The participants were from Simbi (42%), and Maraba (58%) sectors. The age of the participants ranged from 1 year to 97 years. 31% of children below 14 years had low Hb levels. There were 15% of pregnant women with low hemoglobin levels. High blood sugar in Simbi was at 9.80% and 11% in Maraba. Increased glucose level predominant in females of Simbi sector (70%). In the Maraba sector, the increase of blood sugar was also found higher in females (57.9%), although the rate was lower compared to Simbi sector. Figure 1 shows the statistics of infectious and non-infectious diseases/conditions evaluated in Huye district (Maraba and Simbi sectors combined).

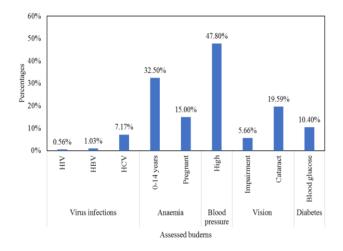


Figure 1: Prevalence of the infectious and noninfectious diseases/conditions evaluated in Huye district.

During this outreach activity, high exposed groups were identified on each assessed disease or condition. Four hundred fifty-three (453) citizens were screened for HIV, 451 for HBV, and 485 for HCV. Apart from the viral infections reported above, 326 citizens, of whom 151 were under-5 children, 132 were school-aged children, and 52 were pregnant women, benefited from the screening of anemia. The visual impairment (VI) and cataract were screened in 321 and 228 citizens, respectively. Furthermore, BMI and blood pressure were determined in 470 adults. However, regardless of any factor, 251 citizens benefited from knowing their blood glucose status.

DISCUSSION

This community outreach was the first medical laboratory professional's week organized in Rwanda by health sciences students from the university of Rwanda; the institut d'Enseignement Supérieur de Ruhengeri (INES-Ruhengeri), with the support of educators from the university of Rwanda, college of medicine and health sciences and other health care professionals from different institutions as well as local NGOs. Infectious diseases and NCDs reported in this outreach had already been documented in Rwanda as diseases of public health importance. However, the extent to which rural communities are burden, especially with NCDs, is poorly known.

In this outreach activity, hypertension was evaluated based on the risk assessment conducted in the study by Nahimana et al who showed that residing in semi-urban areas, being an adults and being an alcoholic are the factors contributing to the prevalence of hypertension. The observed rate was high compared to the prevalence of hypertension previously observed among working adults in Rwanda, and the general population. The rate observed was also high compared to the adult population of Nepal (37%) and Ethiopia (28.3%). Although this was a cross-sectional assessment, our findings suggest a high prevalence of hypertension in semi-rural areas of Rwanda.

This study also revealed a high VI (vision impairment) rate compared to the recent documented in Rwanda. ¹⁵ In addition, although there are reports that emphasize on the efforts made in the surgery of cataract, the rate of cataract observed in these communities was very high. ^{16,17}

Considering the impact of anemia in the development of the health status of a child and a pregnant woman, hemoglobin levels for children under 15 years and pregnant women were also assessed. The findings differ slightly from the findings by Donahue et al, who revealed a prevalence rate of 38% among under 15 years children and 17% in pregnant women in Rwanda. Additionally, the reported rate in the present study was lower compared to the global estimate of 43% in children. In pregnant women, the rate of anemia

observed was also very low compared to global estimate of 38%, and the prevalence rate observed among pregnant women of India (49.7%).^{19,20} This may be the result of current national efforts towards maternal and child health care.

Speaking of the health burdens in the community, the leading causes of morbidity and mortality related to viral infections cannot be left unspoken.²¹ For that perspective, HIV, HBV, and HCV were screened in the citizens of Simbi and Maraba sector. Contrary to the expectations, as Rwanda is regarded to have an intermediate rate of HBV, our findings indicate a low rate of HBV, but rather a high rate of HCV compared to the estimated prevalence rate in Rwanda (3.1%).^{22,23} Furthermore, in contradiction to the current estimated HIV prevalence (around 3%) in the general population of Rwanda, the HIV status reported by the current activity was very low.²⁴

In the current outreach, the blood glucose level, a leading cause of renal failure, was also screened.²⁵ This was triggered by a recent report indicating a 3% mortality associated with diabetes in rural Rwanda during a period of 2 years of follow up.²⁷ Our findings indicate that hyperglycemia in these communities is low compared to the overall prevalence of type 1 diabetes in Rwanda among under 26 years old.²⁶

Taken together, data from this outreach activity indicate that NCDs may be underestimated, especially in rural areas where access to sophisticated health care is almost inexistent. Further investigations taking into consideration family history as well as longitudinal studies are warranted for tailored interventions.

The outreach has also highlighted the potential additional contribution of health education in the control and prevention of diseases. Indeed, health professionals can contribute to disease control while still in training as has been demonstrated by the success of this outreach. In addition, students benefited from this activity through interaction with peers from other schools, health professionals and NGOs, sharing ideas and learning from each other. They also gain practical hands-on skills, planning skills as well as a sense of social responsibility.

CONCLUSION

This outreach activity benefited both students and the broader community in many ways. Indeed, findings highlighted the increasing burden of NCDs in rural communities and call for further investigations and interventions. Students also were facilitated to interact with the community and practice their knowledge in the 'real world' environment.

Such activities provide a model for integrating community service in the health education curriculum. However, for such integration to be effective and sustainable, there is a need for increased public-private partnerships, increased student interest in community service, and the much-needed faculty support and recognition.

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