Rwanda Public Health Bulletin

Vol. 2 (3); September 2020

Online ISSN: 2663 - 4651
Print ISSN: 2663 - 4643

HIGHLIGHTS

1. Impact of COVID-19 on Mental Health
2. Current Global Trend of COVID-19 Pandemic
3. Use of Immediate Postpartum Family Planning
4. Improving Post-Delivery Complications and Quality of Birth
5. Prevention of Mother-To-Child Transmission (PMTCT) of HIV

Ministry of Health

Rwanda Biomedical Centre
Healthy People, Wealthy Nation

Rwanda
Public Health Bulletin

General Information

Rwanda Public Health Bulletin (RPHB) is an open access source and peer reviewed journal published by Rwanda Health Communication Centre (RHCC)

Its mission is to serve as a knowledge sharing platform for national and international public health scientific information. Content published under RPHB will be used to control and address potential public health outbreak threats and strengthen health systems through real time availability of information.

This will allow more and effective communication between policy makers, researchers and health practitioners.

A new issue is published quarterly with supplements and special reports. Publication materials are submitted online at https://www.rbc.gov.rw/publichealthbulletin/manuscripts/submission and should fulfil the RPHB's instructions.

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Publisher: Rwanda Health Communication Centre (RHCC).

Online ISSN: 2663 - 4651, **Print ISSN:** 2663 - 4643

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CONTENT

Dear Readers,

I take this opportunity to thank readers of the Rwanda Public Health Bulletin (RPHB) for your support and continuous interest in the bulletin's content.

This issue comes out in a period where Rwanda is progressively recovering from the COVID-19 crisis. This is evidenced by the decrease in incidence and prevalence with high recovery rates.
Nevertheless, I believe the effect and impacts of COVID-19 might be evident for a long period during and post-COVID-19. For instance, COVID-19 will inevitably leave behind strong effects on mental health. Rwanda and the world in general will have to implement coping strategies to accomodate such impacts.
In this issue, you will read about the impact of COVID-19 on mental health in Rwanda on broader perspective as well as an update on the global pandemic trend. You will also find content on other health subjects other than COVID. This issue features the acceptability of family planning, maternal and child health.
As the country is still fighting the pandemic, other public health problems were not forgotten and the RPHB has considered them alongside COVID-19 in this publication.
This issue highlights: Impact of COVID-19 on mental health in Rwanda, the current global trend of COVID-19 pandemic, the use of immediate postpartum family planning at Kacyiru hospital, improving post-delivery complications and quality of birth practice in district hospitals in Rwanda and Prevention of Mother-to-Child Transmission (PMTCT) of HIV in Karongi District, Rwanda.

I would like to call for your support to the RPHB by submitting your works to the bulletin.

Stay healthy and safe.

Dr. Sabin Nsanzimana, MD, PhD
Director General
Rwanda Biomedical Centre

Dear Colleagues,

I'm pleased to present you the third issue of the Rwanda Public Health Bulletin (RPHB).

As the second wave of COVID-19 is on continuous rise globally, Rwanda has eased restrictions as it experienced the decrease in new cases and continues to closely evaluate the progress and follow up with the updates on the COVID-19 to take necessary measures.
As measures put in place by the Rwandan government were effective in the fight against the pandemic, Rwanda continues to ease restrictions and has resumed activities while keeping some prevention measures.

In the efforts to contain the pandemic, Rwanda remains working with different organizations worldwide to keep up with the updated and effective management in the fight against COVID-19.
Public health professionals and healthcare workers are encouraged to be constantly informed on the current progress and latest updates on scientifically approved treatment options and prevention measures. While dealing with COVID-19 impacts, healthcare professions are urged to consider other public health issues. They have to stay updated as the country stabilizes the progression of the pandemic while waiting for the development of the vaccine.

As you read this issue, I would like to note that solidarity and collaboration will enable us to effectively respond to this pandemic.

I wish you a pleasant reading.

Prof. Leon Mutesa, MD, PhD
Editor-in-Chief

Impact of COVID-19 on Mental Health in Rwanda

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Received: August 28, 2020
Accepted: September 15, 2020
Published:September 30, 2020

Cite this article as: Kalisa et al. Impact of COVID-19 on Mental Health in Rwanda. *Rw. Public Health Bul. 2020. 2 (3): 07-12.*

SUMMARY

Around the globe, the World Health Organization (WHO) has declared the outbreak of a novel coronavirus (COVID-19) as a Public Health Emergency of International Concern [1] in late 2019 and early 2020. Different health prevention measures were then put in place to contain the spread of the virus. In the absence of vaccines, some of these measures included social distancing, country-level lockdowns, and wearing masks among others [2].

Rwanda was the first country in the region to implement a total lockdown and other measures such as limiting social gatherings, closing universities and schools, and restricting mass gatherings in places like churches [3]. Even though these measures have helped to contain the spread and avoid the collapse of health systems [4], such measures also came with many drastic psychological changes in people's lives. The impacts of COVID-19 on mental health require intense interventions and measures to mitigate the consequences on individuals, families, and communities.

INTRODUCTION

Confinements are likely to have affected both physical and mental health in a way that it might have caused stress, anxiety, depression, and possibly addictions [5]. These emotional and behavioral changes associated with a pandemic were seen and documented following the 2009–2010 H1N1 influenza in which scholars identified emotional and behavioral needs which in turn constituted risk factors for poor physical health improvement and recovery [6].

The current literature highlights several possible risk factors that affect the development and reactions to health crises such as COVID-19 with pre-existing physical and mental conditions often considered as predicting factors of poor mental health outcomes from direct and indirect exposure to a pandemic [7]. Therefore, with a shortage or no primary data research carried out to investigate the impact of COVID-19 on mental health in Rwanda, this paper presents an opinion analysis on Rwanda's issue.

Mental health situation before COVID-19 pandemic

Rwanda has gone through intense socio-cultural changes and historical events that are inseparable to its current mental health situation [8]. The country experienced an atrocity that took over 1 million people's lives exterminated in just 100 days during the genocide against the Tutsi in 1994 [9]. It is obvious that the impact on Rwandans' mental health because of the magnitude of destruction and loss during the genocide was high. This led to the establishment of a mental health program in 1994 to deal with such resulting consequences [9,10,11].

It should be noted, however, that despite different mental health programs, a recent mental health survey showed the highest prevalence rates of mental disorders of 20.5% (N=19,110) and 52.2% (N=1271) both in the general population and in the sub-sample of survivors of the 1994 genocide against the Tutsi respectively [12,13]. The most prevalent mental disorders were major depressive episodes (12.0%), panic disorder (8.1%), and posttraumatic stress disorder (PTSD) (3·6%) in the general population. In genocide survivors, the major depressive episode was (35.0%) PTSD, and panic disorders (27.9% and 26.8%, respectively). Alcohol use disorder was reported at 1.6% in the general population and 4% among genocide survivors [12].

Therefore, it is considered that the preexisting mental health disorders in Rwanda is likely to have been exacerbated by COVID-19 and lead to additional mental health difficulties.

Mental health support systems

Healthcare institutions worldwide have been struggling to cope with these unprecedented times of COVID-19 [14], and Rwanda makes no exception to this. Also, Rwanda already had existing difficulties in managing mental health cases before the current COVID-19 outbreak [9]. Moreover, psychiatric and psychological face-to-face consultation interviews with patients and groups' psychotherapies are currently reduced to prevent COVID-19. At the same time, there is a noticeable increase in people with underlying mental illnesses [9,12].

Moreover, the situation has reached a tipping point for mental health treatment centers with hospitalization services that have been struggling with limited bed capacity and large numbers of hospitalized patients, making it impossible to practice COVID-19 preventive measures such as physical distancing.

Furthermore, community-based mental health programs established by different non-government organizations [9] working in psychosocial support interventions and groups for people with trauma, grief, and others are at a standstill due to restrictions on travel and gatherings. Besides, homecare visits for people with mental health difficulties were reduced and/or canceled in some instances.

There are no or limited studies on healthcare providers' mental health during COVID-19 in Rwanda. Previous studies suggest workers' burnouts, vicarious trauma, anxiety [15], among others on global scales. We would also suspect plausible increases in psychological stress and depression, considering the scarcity of healthcare providers against the high demand response to COVID-19.

HIGH-RISK POPULATIONS

People with underlying mental illness

Countries' health systems are currently focused on testing and preventing the progression of COVID-19; therefore it would be reasonable to believe that people's thoughts and behavior are affected by the pandemic [16]. However, psychological distress following the pandemic itself and established restriction measures may vary among individuals. In the face of the unprecedented health cataclysm, individuals display extensive worries about health and their future, persistent uncertainty; maladaptive behaviors, externalized and internalized anger, aggressiveness, negative emotions of fear, sadness, and irritability [17,18]. These manifestations are perceived to be worse on people with pre-existing mental difficulties.

Prevention measures such as restriction of movements and total lockdowns during the COVID-19 era might have negatively affected people with underlying mental illness, causing some of these patients to evade psychological support or use psychotropic drugs making their conditions more acute and dangerous. In some instances, being restricted to attending safe space group sessions where they used to share their experiences has also affected their treatment course.

Before the pandemic, some generous people and organizations offered support of different types to patients with mental difficulties, particularly patients discharged from psychiatric hospitals. Since almost everyone is copping with challenges imminent from the pandemic, there is a significant decrease in support or help mental health patients used to receive. This has, in return, exacerbated their conditions. Therefore, individuals with pre-existing psychological difficulties predict higher psychological impacts following the pandemic than the general public.

Grieving people

Dealing with a significant loss can be one of the most challenging times in a person's life [17]. When a death occurs under challenging moments like in the COVID-19 pandemic context, family and friends can feel additional distress as they are unfamiliar with new ways of participating in funerals. Rwanda's cultural norms before COVID-19 required all family members, friends, and the larger society to participate in funeral activities and support the deceased's family. It was the same culture for happy events, as well [19]. Therefore, it was expected to find many people at the home of the deceased who came to support and comfort the rest of the family members and probably stay overnight [20,21]. From a mental health perspective, such cultural practices offer the bereaved family emotional comfort, prevent social loneliness resulting from broken attachment, and prevent complications of grief [22].

With COVID-19, restriction measures were put to limit the number of people attending social events. In the instance of funerals, only 30 people are currently allowed to attend and for a limited period, cultural funeral rituals like "Gukaraba" and "Gukura ikiriyo" (loosely translated as washing hands and ending the mourning period) are not permitted and ultimately during quarantine; religious ceremonies for the deceased were not allowed [3]. For Gukaraba, the ritual signifies "washing off the death" as a symbolic way of separation from the dead so as death won't follow the living, and this is done using water to purify and wash off the dirt [20].

Consequently, grieving people's mental health is expected to be adversely affected due to the complication of grief among bereaved individuals during the COVID-19 crisis. The complication of grief may stem from conditional bereavement so that there are conditions and protocols to observe in funerals, no complete funerals, and the sense of guilt among relatives of the deceased and other significant ones that may originate from not attending the funeral ceremony.

Victims of violence

The impact of violence is not merely physical but can also be emotional and financial [23]. Whether it is domestic violence, intimate partner violence, or gender-based violence; all types of violence were found to cause immense consequences, especially on victims' mental health [24]. Even if anyone can be a victim of abuse, neglect, or actual violence, the literature demonstrates that women and children are the most at risk. At the same time, elderly and disabled people suffer from neglect [5,17,25].

Today, some of the COVID- 19 restriction measures are likely to have fuelled violence, especially domestic violence. Based on personal opinions, the increase in close contact between the victim and the abuser in terms of shared space and the increase in stress caused by social, economic, psychological factors associated with pandemic offers an opportunity to the abuser to commit more violence.

The lockdown might have hindered the victim from escaping abuse; and reduced the victim's contacts with outsiders [26]. Therefore, it is more likely for some of the COVID-19 measures to have precipitated or even rekindled pre-existing conflicting situations in some families. In some instances, it might have evoked open conflicts.

Children and elderly people

The magnitude of the impact of COVID-19, especially in children and adults, is still yet to be investigated in Rwanda. However, with the closure of schools and children having to spend time in quarantine within families that may be violent and abusive, one may predict possible psychological wounds and impairment in the brain and psyche development and a likelihood of substance abuse and suicidal thoughts at a later age [27].

Children with an intellectual disability such as those with Autism Spectrum Disorder may have had or continue to have limited support from specialized professionals and institutions, hence rendering them more vulnerable.

Nonetheless, children from wealthy families whose education was continued online might have had better coping mechanisms to the psychological distresses, some have resorted to finding alternative ways involving spending much time on social media and using different technologies. However, on the other side, this dependence may result in a technological addiction for these categories of children [28]. Children of frontline health workers are likely to have faced more mental impact as their parents' time has dramatically reduced. More to this, such parents are likely to have enforced

preventive measures at home to minimize contamination risks from their work. This might make children from these families develop a feeling of anger, aggression, and neglect.

Another potential category of vulnerable communities to mental health difficulties because of COVID-19 has been identified as elderly people [29]. In Rwanda, the situation has been intensified with social isolation and reduced social interactions contributing to physical and mental health issues [29]. Heightened precautions and media pointing of elderly persons as having a high mortality rate due to COVID-19 may have contributed to elicit mental health distresses among elderly people coupled with other factors such as: not attending a social event like the burial of their loved one and marriages-events that would otherwise keep them busy and engaged. Depression cases may be high in this category of people. In addition to this, there are few residential homes for elderlies in Rwanda because society expects the direct family to take care of their elders. Lacking interactions with age-like people may have also resulted in other psychological distresses, including anxiety, panic, adjustment disorders, depression, chronic stress, insomnia, among others [30]. Although aging has been documented as a predisposing factor to physical and mental health disorders [30], there is still a need to further research to understand to what extent COVID-19 impacts the mental health of elderly people.

Incarcerated people

It is globally known that COVID-19 is rapidly spread when people are close to one another. Social distancing is among measures to contain the pandemic, whereby it is advised to put the interval of at least 1 meter between two people [31]. However, there is context like being incarcerated were applying such mechanisms of social distancing is almost impossible due to overcrowding; hence the higher risk of contamination with COVID-19. Today, incarcerated people do not only suffer from the guilt of their crimes or their daily living styles as inmates but also with consequences they face that originate from COVID-19. Among other consequences, prisoners are also being affected by procrastinations of their appeal dates at judicial courts- hence staying longer than expected in incarceration. Another factor could be the lack of family member visits. This might also be aggravated by the fact that an incarcerated person is not allowed to communicate with family and the loved one which might create high anxiety levels.

With COVID-19, incarcerated people may experience extensive stress and worry; caused by the preoccupation about their health at risk once someone in the compound tests positive.
Furthermore, it stabilizes incarcerated people and restores mental calmness; when they are sure that their family is doing well [32].
All the above-stated factors negatively affect incarcerated people so that they can potentially trigger a feeling of loneliness and hopelessness. Thus, it is quite clear that the pandemic might leave behind a heavy psychological burden to endure.

A SILVER LINING DURING COVID-19

The phenomenon of psychological resilience, defined as the ability to support or retrieve psychological well-being during or after addressing stressful disabling conditions [33], has received a lot of attention in the scientific world. The tragedies of the 1994 genocide against the Tutsi [9] in addition to intergenerational difficulties experienced by Rwandans over the years, although no clear literature available, anecdotes data have been suggesting the presence of psychological resilience skills that have encouraged striving even during the most terrible circumstances.
These underlying coping strategies to difficulties for some of Rwandans could explain some of the positive perspectives observed during this pandemic.
Additionally, the time and space created by COVID-19 [34] gave rise to social support and constructive conversations within families, couples, children, and others as they spend more time together. Research has shown a higher association between social support and reduced likelihood to develop psychological distresses and psychiatric conditions [33].

A CALL FOR ACTION

The above-mentioned expected mental health impacts of COVID-19 will require intense interventions and measures to mitigate the consequences on individuals, families, and communities.
Carrying out public and community mental health

awareness, such as public discussions on the taking care of mental health during challenging times by professionals, should be paramount and channeled through all community existing platforms. Messages of hope are necessary and need to be broadcasted by media outlets and posted in all public spaces to reach grassroots levels.

Alternative mental healthcare programs such as the use of Telepsychiatry, e-mental health, and other technological services connecting mental health professionals to service-users at the community level should be leveraged in providing psychotherapy and psychiatric consultations.

Additionally, Rwanda, through its National Transformation Strategy, has boosted technological development such as the use of drones in delivering blood as well as medications to patients with chronic illnesses during COVID-19. This can be a great source to tap into in mental health medication delivery to individuals impacted by COVID-19 preventive measures and who cannot afford transportation to referral hospitals.

Much attention should be put on monitoring high-risk populations who are susceptible to mental illness and healthcare providers should be trained on stress management skills as well as setting up clinical supervision sessions for those undergoing mental stress as a result of their work.

Besides, people with underlying mental illnesses such as anxiety, depression, panic, etc. should be provided with practical mental health support during quarantine to minimize the distresses that might come with being alone. Likewise, youth with addiction problems should be regularly supported by professionals to avoid relapses.

In conclusion, mental health support screenings should be provided to COVID-19 suspected as well as confirmed cases to understand better individual mental health needs.

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The Current Global Trend of COVID-19 Pandemic

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Received: August 21, 2020
Accepted: September 20, 2020
Published:September 30, 2020

Cite this article as:
Nsanzabaganwa et al. The Current Trend of COVID-19 Pandemic. *Rw. Public Health Bul. 2020. 2 (3): 13-15.*

INTRODUCTION

Since it was reported in Wuhan, China, in December 2019, the 2019 novel coronavirus disease (COVID-19) has spread worldwide, presenting one of the most serious global health pandemics [1]. Worldwide, over 32 million COVID-19 cases have been reported with over 300,000 new cases in 24 hours, and over 980,000 deaths [2,3].

Daily statistics show that Africa remains the region with the least number of both COVID-19 infection cases and deaths with 1,1 million confirmed cases and 244 daily increase and 143 deaths as of 25 September 2020 (Figure 1 and 2) [2].

Rwanda has been experiencing a decrease in COVID-19 infection cases and deaths and an increase in recovered cases. Rwanda has made progress in increasing the number of daily tests, and as of 25 September 2020, Rwanda reported 4,789 infection cases and 29 deaths (Figure 3).

In the absence of any curative treatment or vaccine, supportive treatment options usually used to treat various diseases have been shown to be effective in treating COVID-19. Preventive measures to minimize the spread and break the transmission continue to be the best options available [1,4]. However, scientists worldwide are racing to develop the treatments and vaccines to stop the pandemic, which is continuously claiming lives and paralyzing the global economy [5].

The number of reported daily cases has been rapidly increasing; with the Americas being the most affected region: with 53% of all newly confirmed cases [6].

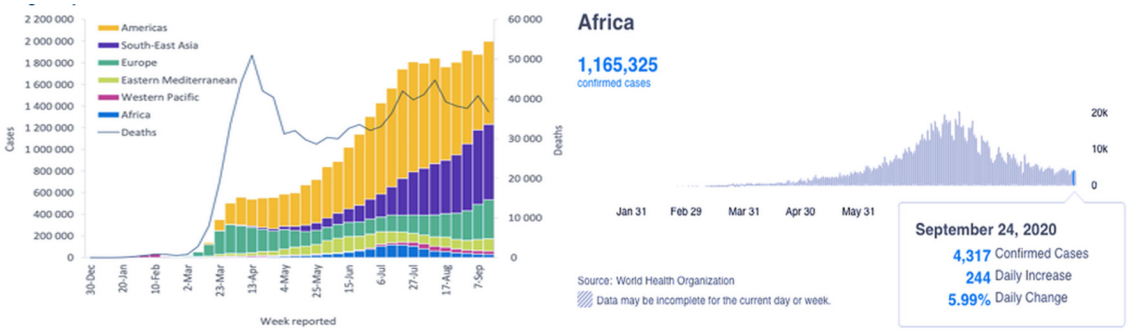

Figure 1: *Number of COVID-19 cases reported weekly by the WHO Regions 30 December 2019 through 20 September 2020 (Left) and by Africa (Right) as of 24 September 2020 (Adapted from WHO COVID-19 Situation report).*

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. **Publisher:** Rwanda Health Communication Centre, KG 302st., Kigali-Rwanda. Print ISSN: 2663 - 4651; Online ISSN: 2663 - 4653. **Website:** www.rwandapublichealthbulletin.org

Asia has seen a steady increase in reported cases and deaths, with India reporting the majority of cases, up to 85% of all confirmed cases in the region. In China, the cases have slowly declined since the start in Wuhan and peak in February 2020 due to drastic measures to slow down the pandemic by the Chinese authority [6].
In the mid-April to early June, the trend in the European Union and the United Kingdom declined, after which it reached a plateau, however in recent weeks, there has been a resurgence in countries like France, Germany, Netherlands, Spain, and the United Kingdom [2,4].

Africa has seen a 2% decrease in newly confirmed cases and a 17% decrease in deaths. South Africa consistently reports the largest number of cases with a 6% increase in cases in the past seven days, followed by Ethiopia, Algeria, and Mozambique [5]. South Africa accounts for 64% of reported deaths in Africa. The majority of African countries report ongoing community transmission [2].
Since the report of the first case of COVID-19 on 14th March 2020, Rwanda has also experienced the increase in the number of new infections with the highest daily increase reported on 25 August 2020 of 231 new cases. The decrease in newly infected cases was reported from early September 2020. Rwanda reported the first deaths on 4th June 2020, and as of 25 September 2020, 29 deaths were reported. Recovery cases have been increasing to 3092 recovered patients as of 26 September 2020 (Figure3).

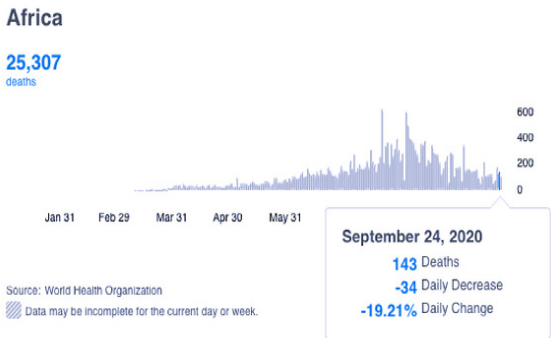

Figure 2: *Number of COVID-19 deaths reported weekly by Africa as of 24 September 2020 (Adapted from WHO COVID-19 Situation report).*

VACCINE DEVELOPMENT

A new pandemic vaccine development paradigm that compresses the vaccine development timeline from 10-15 years to 1-2 years has been implemented. Researchers worldwide have been racing to develop COVID-19 vaccines, with over 166 vaccine products in development [7].
Scientists have entered clinical trials on humans with 42 vaccines, and at least 93 preclinical vaccines in animals.
In September 2020, Novavax launched a Phase 3 trial in the United Kingdom, and a larger Phase 3 trial is scheduled in the United States in October

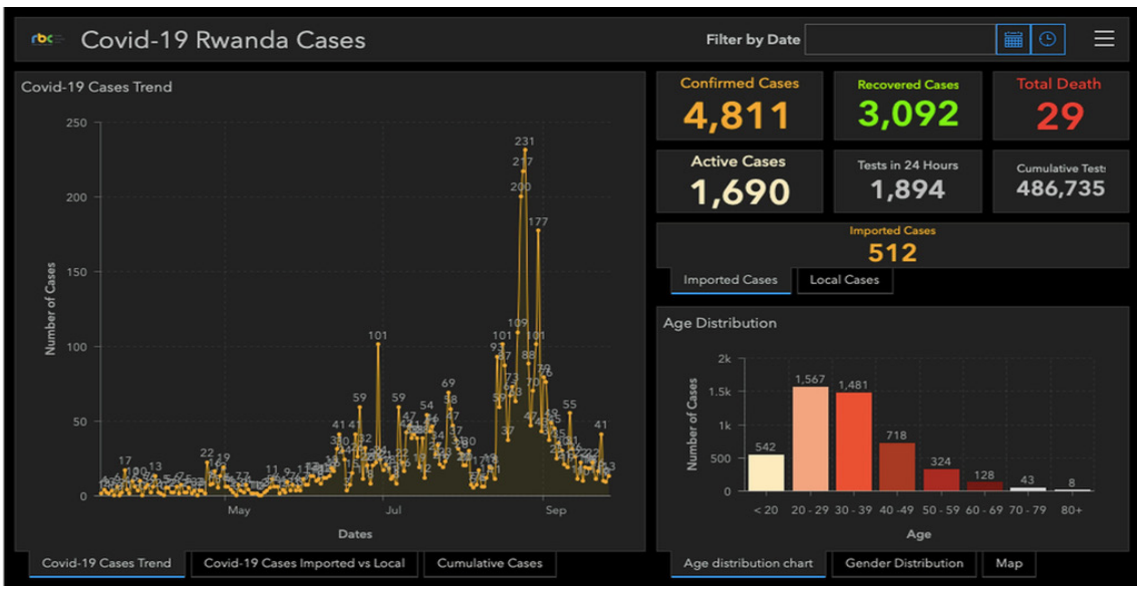

Figure 3: *COVID-19 cases trend in Rwanda as of 26 September 2020 (Adapted from RBC "COVID-19 Cases Trend" Report of 26 September 2020, https://www.rbc.gov.rw/index.php?id=707).*

2020 [8]. Its vaccine, called NVX-CoV2373, is a stable, prefusion protein made using Novavax' recombinant protein nanoparticle technology [9].

CanSino Biologics, in partnership with the Institute of Biology at the country's Academy of Military Medical Sciences, developed a vaccine based on an adenovirus called Ad5-nCoV. In August 2020, they began Phase 3 trials in Saudi Arabia, Pakistan and Russia [10].

Johnson & Johnson, which developed a vaccine against Ebola, began a Phase 3 trial in September. Its COVID-19 (JNJ-78436735) vaccine is based on making vaccines out of a virus called Adenovirus 26, developed by Beth Israel Deaconess Medical Center decades ago [11].

There are currently 27 vaccines testing safety and dosage, 14 vaccines in expanded safety trials, and 11 in large scale efficacy tests [10].

There five vaccines emergently approved for early or limited use such as the vaccines developed by CanSino Biologics in China approved by the Chinese military for a year as a "specially needed drug [12], Gam-COVID-Vac (Sputnik V) developed by the Gamaleya Research Institute, part of Russia's Ministry of Health [13]. Two-Phase three vaccines by Sinopharm were given emergency approval in the United Arab Emirates [10].

The vaccines approved for early or limited use while still under phase 3 clinical trials. They were approved for limited use on a specific group of people based on their promising clinical trial results [10,12,13].

Although most of the vaccine products give promising results, there are still many uncertainties about the epidemic, and currently, the number of COVID-19 cases keeps increasing in many countries, including Rwanda. Yet, no cure or vaccine is proven to be definitely effective against the virus. Preventive and hygiene measures remain the best options for combatting the pandemic and people should be kept informed and sensitized to maintain efforts in the fight against COVID-19 as they resume normal activities.

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Original Article

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The Use of Immediate Postpartum Family Planning at Kacyiru Hospital, Rwanda

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Received: May 21, 2020
Accepted: September 11, 2020
Published:September 30, 2020

Cite this article as:
Uwimbabazi et al. Use of Immediate Postpartum Family Planning at Kacyiru Hospital, Rwanda. *Rw. Public Health Bul. 2020. 2 (3): 16-25.*

ABSTRACT

INTRODUCTION: Immediate PostPartum Family Planning (PPFP) is the initiation of Family Planning (FP) methods within 48 hours after delivery. Its uptake remains low in sub-Saharan Africa, including Rwanda. This study aimed at analyzing use and identifying motivators and barriers leading to immediate PPFP acceptance among Rwandan women at Kacyiru Hospital (KH), Kigali, Rwanda.
METHODS: This was a qualitative study conducted on postpartum mothers from 1st September to 31st October 2018. The participants were selected by purposive and convenience sampling with respected ethical considerations. In-depth interviews were used to identify themes.
RESULTS: A total of 28 women were enrolled for in-depth 45-minute interviews. Among them, 19 participants accepted and nine refused immediate PPFP. Motivators identified were: Socio-economic reasons, awareness of complications to closely spaced pregnancies, time to breastfeed, peer motivation, prevention of multiple hospital visits, cesarean delivery, freedom to unprotected sex, avoidance of family conflicts, being responsible, confidence in stopping contraception at any time and old age. Barriers were: Perceived poor efficacy and side effects of contraceptive methods, belief of inability of getting pregnant after delivery before resuming menses, religious belief, husband/partner's opinion, fresh cesarean wound, peer demotivation, and first pregnancy.
CONCLUSION: Immediate PPFP uptake is affected with intrinsic and extrinsic factors. Partners and the community (peers) play a role in process of making decision among women who deliver at Kacyiru hospital. Accelerating male participation and engaging with the wider community through innovative strategies that compete with misinformation would improve partnerships with religious leaders.

INTRODUCTION

Immediate PostPartum Family Planning (PPFP) is the initiation of Family Planning (FP) methods within 48 hours after delivery. It focuses on preventing unintended births and short inter-birth intervals through the first 24 months. This is a main public health concern, as 20 % of obstetrical deaths are related to short inter-birth intervals [1,10,16]. Immediate postpartum period is the ideal time for FP given that women are still under hospital observation [10,16]. FP is considered a lifesaving

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. **Publisher:** Rwanda Health Communication Centre, KG 302st., Kigali-Rwanda. Print ISSN: 2663 - 4651; Online ISSN: 2663 - 4653. **Website:** www.rwandapublichealthbulletin.org

intervention for mothers and their children because when birth intervals are too short, there might be risks of prematurity, low birth weight, stillbirth, and probable newborn death. In addition, mothers are also exposed to anemia, risks of miscarriage, abortion, puerperal endometritis, premature rupture of membranes, and possible maternal death [6].

Worldwide, 222 million women didn't have access to modern contraception in the first year post-delivery in 2012 [9]. In low- and middle-income countries (LMIC), about one-quarter of inter-birth intervals are less than 24 months [2,7]

In developing countries, studies indicated that availing women with immediate PPFP prevented an additional 54 million unintended pregnancies [4].

In a study conducted in Jabalpur, India, they found that the commonest factors contributing to the acceptance of immediate PPFP were: literacy, number of living children, length time it took to conceiveafter marriage, antenatal visits, and use of contraceptives especially IUD [2]. In Nigeria and Kenya, the spouse approval, being a single mother, knowledge of FP, age at first pregnancy and sexual activity after child delivery were found to influence the use of immediate PPFP [11, 12].

In Rwanda, 91% of women give birth in health facilities and 87% of married women are considered potential users of FP [5, 8]. Rwandan DHS 2010 estimated that 51% of women had an unmet need for postpartum (within two years of delivery) family planning [20]. A study that integrated postpartum intrauterine device services into maternal care facilities in six LMIC found that in Rwanda, there is the lowest proportion of insertion timings of immediate PPFP [18,19]. There are no data about what influences the use of immediate PPFP in Rwandan women and this study aims at analyzing the use of immediate PPFP, identifying motivators and barriers and their relationship in influencing the use of immediate PPFP among Rwandan women at Kacyiru Hospital (KH), Kigali, Rwanda.

METHODS

Study site: This study was conducted at Kacyiru Hospital (KH) which is the second maternity hospital in Rwanda. KH collaborates with Project SAN FRANCISCO to provide immediate PPFP methods such as intrauterine device (IUD), implants, etc.

Study design: This study used qualitative methods grounded in modern qualitative theory. Purposive and convenience sampling was used to select women admitted in the postnatal ward at KH. Women were recruited into the study after taking decision about the immediate PPFP.

Study population: Participants were selected from all women admitted in the postnatal ward during the study period, from September 1st to October 31st, 2018. As per the study design, two categories of participants were recruited:
1) The first category comprised of women who have delivered during the study period and who accepted immediate PPFP.
2) The second category comprised of women who delivered at the hospital, but declined immediate PPFP.

Inclusion criteria: Rwandan national women who gave birth at KH during the study period, women who were educated on immediate PPFP before or immediately after delivery at KH, and women who were admitted to the postnatal ward within 4 to 8 hours.

Exclusion criteria: women who gave birth in other health facilities or at home who were admitted to KH for postpartum follow-up and post-abortion women who were admitted in postnatal ward.

Data collection: Data were collected by conducting in-depth 45-minute interviews with participants, using an interview guide. A tape recorder was also used by Principal investigator (PI) and an additional interviewer in each interview to capture all information provided by the participant. This study used a seven-page questionnaire to explore the reasons behind the acceptance or refusal of immediate PPFP. Two pages covered ten closed-ended questions on demographic characteristics. Two pages covered eight open-ended questions pertaining to family and relationships. Three pages covered three closed-ended and seven open-ended questions related to the immediate PPFP. The questionnaires were translated into Kinyarwanda, which was the preferred language of all participants.

Data Analysis: Participant statements during the in-depth interviews were audio-recorded, translated, and transcribed. Through discussion, the investigators applied an approach for analyzing qualitative data known as Thematic analysis (Maxwell 2012) method was used to identify major themes pertaining to immediate PPFP motivators and barriers.

Using Maxwell's (2012) interactive approach for

analysis, the themes could be altered or refined as the coding proceeded. This entailed reconsidering the statements that had already been coded related to a theme to determine whether they fit the theme's refined version. During evaluating the statements, the research team revised and refined the definitions of the themes to best fit with similar statements.

The data were analyzed at the individual level to identify general themes in the interviewed group of women, as the purpose of this study was to understand general motivators and barriers that may be linked with decisions to accept or refuse PPFP.

To evaluate the coding system's inter-rater reliability, a second person recoded the discourse units without knowing the themes to which they had been assigned. The number of agreements was then recorded. The two raters obtained a high level of agreement throughout coding each of the twelve themes (95%). Within the eight themes describing types of barriers or stressors, the level of agreement was 94%. After conducting these checks for inter-rater reliability, the discrepancies were resolved through discussion to yield a final coding for each statement that was satisfactory to both coders and the research team.

Ethical consideration: Before conducting this study, ethical approval was sought from the Rwanda National Ethics Committee. The study team ensured that every interview was preceded by a consenting process whereby Participants were given enough information about the study and consented. They had the right to withdraw from the study any time they wanted. Data recorded were kept confidential in a password coded database, no identifications recorded and no disclosure to other parties outside the study investigators.

RESULTS

A total of 28 women were enrolled for in-depth interviews that took 45 minutes each on average.

Socio-demographic characteristics of the respondents

All of the 28 women included were in the reproductive category (21 to 49 years). Half of the interviewed women were in the age group between 21 and 29 years of age. It was found that > 80% of the interviewed women were giving birth to their 2nd child or more. All women that were included in this study had at least a primary level of education. Around 60% of them had secondary level education. Fifty percent of the interviewed

Table1: *Socio-Demographic characteristics of the respondents*

Demographic variable	n	%
Age range		
21–29	14	50
30–39	11	39.3
40–49	3	10.7
50–59	0	0
60–69	0	0
70+	0	0
Marital status		
Single	2	7.1
Married	17	60.7
Living with a partner	9	32.1
Number of pregnancies		
First pregnancy	5	17.9
second pregnancy or more	23	82.1
Lost pregnancies	8	28.6
Living boys	24	85.7
Living girls	21	75
Stillbirth	3	10.7
Total children living	28	100
Education level		
None	0	0
Primary	12	42.9
Secondary	10	35.7
tertiary and above	6	21.4
Religion		
Islam	1	3.6
Catholic	4	14.3
SDA	3	10.7
ADEPR	14	50
Zion temple	1	3.6
Other protestants	1	3.6
Anglican	1	3.6
others(specify)	1	3.6
None	2	7.1
UBUDEHE Category		
Cat 1	0	0
Cat 2	12	42.9
Cat 3	15	53.6
Cat 4	0	0
None	1	3.6

women belonged to the Pentecostal Church in Rwanda (ADEPR). Of the 28 interviewed mothers, 17 (61%) were married, and around 40% were unmarried. Of those unmarried, about 7% were single, and 32% were cohabitating with a male partner. With this study, marriage was defined as having signed a marriage license in front of a legal representative or sworn in by a church leader (Table 1).

Acceptance versus refusal of immediate post-partum family planning

Women were asked different questions pertaining to how many children they wish to have and relationship in their family to probe reasons that might influence their family planning choices (Table 2)

Motivators and barriers to acceptance of immediate PPFP

Twelve motivators and eight barriers were identified and linked with choices related to immediate PPFP.
Socio-economic reasons: worries about providing for children in the future were reported by 92.9% of women (Table 3).

Motivators to accept immediate PPFP

The study authors aimed to identify possible themes described by study participants as motivators to accept the immediate PPFP and barriers. Around 12 themes were identified from the responses as the major factors that would motivate women. Three of these appeared to be

Table 2: *Acceptance versus refusal of immediate PPFP according to different participant characteristics (n=28)*

Characteristics	ACCEPTED	REFUSED
Number of living children	n (%)	n (%)
0-2	14 (73.7)	4 (44.4)
3-4	6 (31.6)	4 (44.4))
5+	2 (10.5)	1 (11.1)
Children wished by the mother in life		
0-2	2 (10.5)	2 (22.2)
3-4	14 (73.7)	5 (55.6)
5+	4 (21.1)	2 (22.2)
Children wished by the partner		
0-2	7 (36.8)	3(33.3)
3-4	8 (42.1)	4(44.4)
5+	4 (21.1)	2 (22.2)
Awareness about immediate PPFP before delivery		
Yes	13 (68.4)	8 (88.9)
No	6 (31.6)	1 (11.1)
Mode of delivery		
Normal	11 (57.89)	4 (44.4)
Cesarean	8 (42.10)	5 (55.6)
Partner contributes to responding to family needs		
Yes	16 (84.21)	9 (100)
NO	3 (15.78)	0

the most convincing reasons for the women to accept immediate family planning after delivery: worries about providing for children in the future, awareness of complications related to closely spaced pregnancies, and concern about the neonate (i.e.: Enough time for breastfeeding). Other women reported that the motivation to get immediate PPFP was related to the fact that they had already birthed their preferred number of children. Among other rare reasons, one respondent who was not married

Table 3: *Main themes identified as motivators and stressors or barriers to accepting Immediate PPFP after delivery (n=28)*

Themes	n	(%)
Motivators		
• Having an old age	2	7.14
• Socio-economic reasons: worries about providing for children in the future	26	92.9
• Awareness of complications related to closely spaced pregnancies	22	78.6
• Need to get enough time to breastfeed	10	35.7
• Get the freedom to have unprotected sex	1	3.57
• To avoid family conflicts	1	3.57
• The woman feels responsible because the husband doesn't care	1	3.57
• Having all children wished in life	5	17.9
• Being confident that they can easily stop contraception any time	1	3.57
• Peer motivation	3	10.7
• Prevent multiple subsequent visits to the hospital	3	10.7
• Mode of delivery: cesarean	3	10.7
Barriers/stressors		
• The belief that a woman cannot get pregnant after delivery before they get their first menses	2	7.14
• Religious belief: we have to bear as many children as we can	6	21.4
• Perceived poor efficacy and side effects related to contraceptive methods	21	75
• Fear of losing husband: Not knowing the husband's opinion	6	21.4
• Fear of losing husband: Husband doesn't accept any contraceptive method use	2	7.14
• First pregnancy	2	7.14
• Mode of delivery: fresh cesarean wound	1	3.57
• Peer demotivation	4	14.3

and was giving birth to her 3rd child stated that she was willing to accept immediate PPFP because she felt she needed to have the freedom to have unprotected sex.

Socio-economic reasons like worries about providing for children in the future

About 93% of respondents were motivated to use immediate PPFP because they wanted to provide for their children as desired and only have children they felt they could care for responsibly.

For example, a 43-year-zsold respondent with six living children who is a fruit seller and married to a construction worker said: : *"Nowadays, life is so hard that it's so difficult to provide all family needs, especially food and school fees for children."*

Another, 23 years old, respondent with three living children who is a seller said that: *"I have accepted to use immediate PPFP (imp anon) because I am still young and am satisfied with children I have, so I want to take care of them as I can't afford to raise more than them due to limited economic ability according to what I earn from my job."*

A 31-year-old with two children from 2 different husbands said: *"Getting pregnant twice without a known husband is a problem. So I immediately accepted to use IUD because I know that I can be tempted to have unprotected sex again".*

Awareness of complications related to closely spaced pregnancies

About 79% of respondents accepted the use of immediate PPFP because of their experiences with their previous pregnancies or because of fear of

having an early or unwanted pregnancy or failure to raise their baby properly.

For example, a 26-year-old unemployed respondent with two living children said that: *"the experience I had as now my older baby has only one year, and I have another today, so I wish it never happen to me again that is why I have decided to use immediate PPFP to avoid such risk."*

Another 30-year-old respondent with three children, 1 prior stillbirth, and 1 lost pregnancy said: *"I accepted (IUD) immediately because I was afraid I could get pregnant again as soon as I reach home. And I wanted to take a break"*.

A 21-year-old single mother who was working as a house girl said: *"I accepted to use immediate PPFP (IMPLANON for three years) because this pregnancy was unwanted, it was my first time, I didn't know how someone can get pregnant, and I decided to not make a mistake again."*

Need to get enough time to breastfeed

About 36% of respondents agreed to use immediate PPFP because they just wanted their children to grow healthy and to have enough time to breastfeed them without any other barrier, like an unwanted pregnancy or closely spaced pregnancies.

For example, a respondent of 36 years with four children said: "*Using this method helps in getting enough time to breakfast"*.

Also, a 35 years old respondent who has lost three pregnancies with two children said: *"The reason I just want to use immediate PPFP it is just because I want my baby to grow very well and to have a healthy life for my family maybe after like 5 years I can decide to have another or not"*.

Peer motivation

About 11% of respondents agreed to use immediate PPFP due to information from other women who had immediate PPFP or other contraceptives. Most women accepted what other women or friends told them more than what health care providers told them; thus, most participants accepted immediate PPFP due to peer pressure or other women's opinions.

For example, a 42-year-old respondent with four children said: *"The reason I have chosen immediate PPFP because I have got all the children that I always wanted to have and I have used IUD as the contraceptive method is because other I have had influenced from other women who use it and it helped them"*.

Another 33-year-old respondent with two children said: *"The reason I have decided to use immediate PPFP (IUD) is due to life experience I have been seeing with other families in society, and I just don't want an unwanted pregnancy."*

Mode of delivery

About 11% of respondents accepted immediate PPFP due to their mode of delivery. Those who underwent cesarean delivery were particularly interested in immediate contraception to avoid another pregnancy too close to their recent delivery.

For example, a 25-year-old respondent with one child said: *"The fact is that I didn't refuse to use immediate PPFP, but if you explain me very well I could choose and use it after my cesarean wound gets well and also I have some fear that because it is my first time it could give me some risks in the body and with this wound too"*.

A 23-year-old respondent with three children said: *"The reason I accepted immediate PPFP (IUD) is that this is my second time of cesarean delivery, and I have to take time for being strong after that operation instead of getting pregnant again."*

Barriers leading to refusal of immediate PPFP

In total, eight themes were identified as the major barriers among the interviewed mothers. The most frequently mentioned theme was *"Perceived poor efficacy and side effects related to contraceptive methods"*. Almost all the interviewed women, including those who accepted immediate PPFP, stressed their worries about the efficacy and/or safety of using different contraception methods.

Perceived poor efficacy and side effects related to contraceptive methods

Among the 28 interviewed, 21 mothers stated that they did not trust PPFP contraceptive methods' efficacy. Among the most questioned methods during the interviews was IUD's, which many believed could fall out without notice. Some thought that these methods' immediate use could prevent them from having enough breast milk for their babies.

For example, a 31-year-old mother with two living

boys from different partners accepted immediate PPFP but stated concerns: *"I'm afraid of the loss of breast-milk, and some people say that the IUD can disappear."*
Another example is a 30-year-old mother with three living children and one prior stillbirth who accepted immediate PPFP. She said *"You can get pregnant even if you have that IUD inside. You can even experience an unexpected removal of that IUD."*

Fear of losing her husband

Many other barriers were related to losing their husbands if they use immediate PPFP. Some (7.14%) stated that their husbands do not like the PPFP, while others (21.4%) said that accepting PPFP could change something big in their sexual relationship with their husbands, leading to separation.
An example is 19 years old, with two living children who refused to use immediate PPFP. She said: *"I did not accept to use immediate PPFP because my husband doesn't accept it, and he told me that when I used those contraceptive methods, we will continue directly separate and that may lead me to complicated life because I am an orphan."*

Religious belief

Another category of women stressed their religious convictions as conflicting with immediate contraception after delivery (21.4%). They stated that they have to bear as many children as they can. A number of these children are from the Protestant religion.
For example, one participant was a 40-year-old Protestant mother with eleven living children (six boys and five girls). A history of one prior abortion, who qualified for is in UBUDEHE category two and did not accept immediate PPFP because she wished to have many children as she could. She said: *"I have refused immediate PPFP due to my personal beliefs, which tells me that it is a sin and as per bible and because my religion does not allow me to use FP."*

Peer influence

Peer influence was identified as both a motivator for some mothers and a barrier for others. Mothers with peers favoring the use of PPFP were more likely to accept PPFP, while mothers with peers discouraging the use of PPFP were more likely to decline PPFP.
An example is a 33-year-old participant with two living children who accepted immediate PPFP and said that: *"I have heard it from another woman who delivered here, and that is why I was immediately asked for it."*
Another example is a 23-year-old mother with three living children who accepted immediate PPFP and said that: *"I knew it from another woman who advised me to use it without waiting for my first menses."*

CONCEPTUAL MODEL

The conceptual model describing the relationships between identified motivators and barriers influencing the take-up of immediate PPFP was used in this study. The first section covers partner-related factors, the second covers intrinsic characteristics, and the third covers knowledge and attitudes. There were intermediate factors such as socio-economic reasons, health education interventions, and peer/community influence related to all three sections (Figure 1).

DISCUSSION

This qualitative study included 28 female participants who had just delivered live newborns. The key research question was to identify possible motivators and barriers for mothers to accept or decline the use of immediate PPFP.

This study first wanted to explore whether the topic related to family planning was relevant for them based on several characteristics. Interestingly, it was found that both married and unmarried women were giving birth, which means that the family planning topic concerns both categories. This finding was not new compared to previous studies. Ahmed and his group were able to show that even if unmarried women are educated about family planning methods and do not wish to have undesired pregnancies, the use of contraceptive measures was still low [1,3]. This is in total contradiction with much of the African cultural wisdom whereby only the women who are married should be the ones to give birth to children.

The results from this exploratory study, like other previous studies, suggest that even unmarried women are concerned with contraception because,

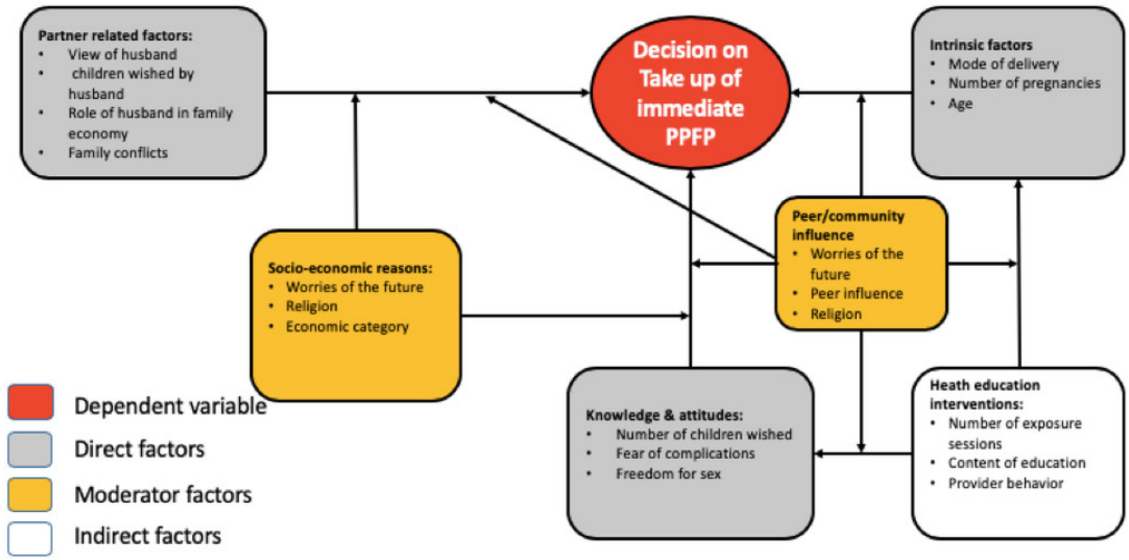

Figure 1: *Network analysis and conceptual model drawn from the interview answers*

at some point, they have sexual intercourse that leads to bearing children [14].

The study was able to identify different motivators and different barriers successfully. Different quantitative studies had been conducted before whereby the acceptability of PPFP among pregnant women, male partner approval, and experience with the use of specific contraception methods were important factors in women's PPFP decisions in this population. Antenatal and early postnatal care need to be adapted to consider these factors [10]. This study was in strong agreement with previous studies about socio-economic reasons or worries about providing for children in the future as a factor that motivates many women to engage in family planning [2,16].

In terms of barriers, findings from this research confirm that contraception awareness and knowledge do not necessarily translate to use. The main barriers to modern contraceptive uptake among young women are myths and misconceptions in the community about the efficacy and side effects of available contrceptives. The findings agree with stress the influence of social network approval of the use of family planning beyond the individual's beliefs. Our study shows that peer motivation influences some women's decisions despite what they know or believe about immediate PPFP or PPFP in general. In settings like these, family planning programming should engage with the broader community through mass and peer campaign strategies to compete with the lay epidemiology that exists, especially where health professionals cannot correct such myths.

Similarly, like other studies reviewed, this study supports the need to sustain public health education on PPFP to gain acceptance among pregnant women. Although many women expressed a desire to practice FP in this study, hesitations about possible disapproval by male partners and the social consequences of unsuccessful covert use continue to hinder the translation of contraceptive awareness and desire into actual use by women. Like other parts of Sub-Saharan Africa, the model of health delivery at Kacyiru Hospital remains female-centered with little or no active male participation. Given the established link between improved reproductive and child health and national development, the government of Rwanda and other sub-Saharan African countries should consider effective strategies to accelerate male participation in reproductive health care.

As demonstrated in other countries, a simple intervention such as a written letter of invitation to a male partner to attend an antenatal clinic with his partner can significantly increase male attendance and promote couples counseling. Previous studies also suggested that legislation can also encourage men to accompany their partners (e.g., requiring employers to provide paid leave for men to accompany spouses to at least one antenatal and early post-natal clinic where FP counseling is

offered). With this study, we find it explicitly paramount since a majority of the interviewed women cannot decide on their own without the involvement of their partners. With economic considerations making many families think carefully about when and how many children they wish to have, it is not surprising that carrying an unwanted or ill-timed pregnancy is an independent predictor of the desire to adopt PPFP. Information about pregnancy circumstances is not collected as part of routine antenatal and postnatal care in Ghana. Consideration should be given to asking this information to serve as an entry point into discussions about adopting PPFP.

In conclusion, immediate PPFP uptake is affected by a variety of factors. Partners and the community (peers) play a role in process of making decision among women who deliver at Kacyiru hospital. Accelerating male participation and engaging with the wider community through innovative strategies that compete with misinformation would improve partnerships with religious leaders.

Acknowledgement

The author givs thanks to Mr. Jean Pierre Musabyimana for his continued support and encouragement. I offer my sincere appreciation for the learning opportunities provided by my committee: Dr. Manasse Ukizinkuru, Dr. Pascal Nkubito, Dr. Tharcisse Ruyange, Dr. Daniel Nyamwasa and Ms. Dianne Verhoeven, for comments on an earlier version of this paper, and the midwives at Kacyiru Hospital for their assistance with data collection.

The author acknowledges all technical and administrative support received from members of the District Operational Research Challenge Fund steering committee: Mrs. Clarisse Musanabaganwa, Mr. Robert Banamwana, Dr. Vincent Tihon, Mr. Randy Wilson, Dr. James Humuza, Ms. Nadia Hitimana, Dr. Raymond Muganga, and Mrs. Mecthilde Kamukunzi. Further acknowledgments go to the Ministry of Health/Kacyiru Hospital, University of Rwanda/The School of Public Health, and Tulane University/ The School of Public Health and Tropical Medicine.

Enable paid 2018 DORCF research grants: The Belgian Development Agency, the Swiss Cooperation, and USAID through the Rwanda Health Systems Strengthening Project implemented by Management Sciences for Health (MSH).

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Review Article

Open Access

Improving Post-Delivery Complications and Quality of Birth Practice in District Hospitals in Rwanda

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Received: August 21, 2020
Accepted: September 05, 2020
Published:September 30, 2020

Cite this article as: Tuyishime et al. Improving Post-Delivery Complications and Quality of Birth Practice in District Hospitals in Rwanda. *Rw. Public Health Bul. 2020. 2 (3): 26-29.*

INTRODUCTION

Reducing maternal mortality is a major focus worldwide. It was estimated that about 830 maternal deaths occurred every day around the globe in 2015, roughly 303 000 per year; 95% of the deaths have occurred in low-income countries and over 60% in Sub Saharan Africa [1].

Globally, 75% of maternal deaths are caused by the following 5 complications: hemorrhage, infections, preeclampsia and eclampsia, obstructed labor, and abortions [1]. This is similar to the situation of Rwanda where these 5 common causes of maternal mortality in Rwanda have remained the same for the last 6 years. In 2016, Postpartum hemorrhage (PPH) and sepsis accounted for 46% of maternal deaths in Rwanda; more than 70% of deaths occurred in teaching and district hospitals, and 64% of deaths occurred during the postpartum period [2].

Rwanda has achieved the Millennium Development Goal (MDG) 5 by decreasing the maternal mortality rate (MMR) dramatically from 1071 in 2000 to 210 per 100,000 live births in 2015 [3,4]. However, this is still unacceptably high in comparison to the MMR in high-income countries like the United Kingdom (UK), whose MMR is 3.49 per 100,000 [5].

There is evidence that most deaths in tertiary hospitals are associated with problems that began in district hospitals. In fact, in 2015, 96% of maternal deaths and near-misses at the main teaching hospital in Kigali (CHUK) occurred after a transfer from DHs and were mostly due to infections (32%) and PPH (20%); and most of these complications are direct obstetric complications [2].

These figures call for effective interventions to improve the safety of deliveries in district hospitals in Rwanda. Indeed, a study done in the United States (US) found that maternal deaths caused by PPH and infections are highly preventable through training and the use of guidelines to screen for risk factors and to manage complications early (by 93% and 43% respectively) [6].

PROBLEM

The following gaps need to be addressed to improve the quality of maternal care in DHs and decrease mortality among women referred from DHs:

1. Safety of cesarean section (CS): In our findings, approximately 80% of complications occurred following a cesarean section with a mortality of 18%. An improvement in the safety of CS at DHs may decrease considerably the maternal mortality rate.
2. Management of common complications following deliveries (Post CS peritonitis, PPH, and preeclampsia and eclampsia): In our findings, more than 90% of complications occurred following these 3 complications. Improvement in the prevention and timely management of these

3 complications may decrease considerably the maternal mortality rate.

3. Use of guidelines and protocols: Use of guidelines and protocols have shown to decrease mortality considerably in other settings [6]. Adapting this intervention for DHs has the potential to improve the maternal mortality rate.

Evaluation framework

To decrease the maternal mortality in DHs, effective, feasible, low cost, and sustainable interventions are needed. An appropriate intervention should meet the following criteria:

1. Effectiveness: The intervention has shown to be effective in other settings
2. Cost: The intervention is low cost
3. Sustainability: The intervention can be run by DHs with minimal support after the implementation

POLICY ALTERNATIVES

This memo will explore the following policy options in our recommendations to the Ministry of Health to improve the quality of maternal care and decrease maternal mortality in district hospitals in Rwanda.

LONG TERM

Obstetric Surgical Skills and Emergencies (OSSE) short course for non-specialists [GPs, Non-Physician Anesthetists (NPAs)], and Recovery or Operating Room Nurses

The OSSE course will focus on common complications in each hospital.
An initial 5-days training of trainers (15 in each hospital including 5 GPs, 5 NPAs, 5 Nurses) followed by 2 days mentorship to provide course materials and to observe the new trainers one-day teaching. At the end of the mentorship, the team will initiate the implementation of pre-printed guidelines for common complications in every patient file; this has the potential to improve their compliance with taught best practices and to improve the quality of care.
This intervention has been shown to be effective, it is low cost as there is already a budget for capacity building, and it is sustainable as most of the trained staff will stay in DHs and will train this course to new staff as needed. The trainers will come from 3 professional associations (Rwanda Society of Obstetrics and Gynecology, the Rwanda Society of Anesthesiologists, and the Rwanda Nursing and Midwives Union).

By using technology, the duration of the courses will be decreased to one day of hands-on practice while other contents will be completed online (See attached Appendix 1 of the list of available courses). As long as the staff is motivated, multiple free online courses exist like Help Mother Survive https://hms.jhpiego.org/training-materials/ and SAFE obstetric course http://www.e-safe-anaesthesia.org/, just to name few.

The program evaluation may use validated standards of care tools including participants' Non-technical Skills (NOTSS) and obstetric surgical skills checklists (examples: cervical tear, 4th-degree perineal tear) as described by Touch Surgery team. Details about NOTSS and Touch Surgery can be found here (https://www.rcsed.ac.uk/professional-support-development-resources/learning-resources/non-technical-skills-for-surgeons-notss/notss-for-trainees and Obstetric Simulation-based Course (Touch surgery): https://www.touchsurgery.com/simulations/cesarean-section

For this program to be successful, there is a need for strong local ownership at the hospital level through the establishment of dedicated education and patient safety team which will conduct courses at least one day per week with remote support from experienced trainers from the 3 professional associations.
The hospitals and healthcare providers will need to make the commitment for these courses to be taken seriously; in our previous experience, some course participants were motivated by the per diem and were not reading course materials at home. Also, some hospitals organize courses to check the box during the accreditation period only.

Use of guidelines as posters and pre-printed orders

Currently, the guidelines exist in the format of big books which are not easy to use. These guidelines should be operationalized to be user-friendly and completed within the patient charts. A study done in 2017 at Masaka District Hospital by Tuyishime

and colleagues, for example, found the compliance to the WHO Safe Childbirth Checklists of 56% after training.

In addition, our preliminary data on the implementation of the Modified Early Obstetric Warning Signs (MEOWS) in 4 district hospitals found a compliance rate of 75%; length of forms, low staff/patients' ratio, language barrier (English), low number of trained staff, and lack of printed forms were factors reported by staff as reasons of not filling the forms.

The use of guidelines should be aligned with accreditation requirements and patient safety initiatives as proposed by the Association for Patient Safety Movement as an example (https://patientsafetymovement.org/actionable-solutions/actionable-patient-safety-solutions-apss/). In order to implement these guidelines, a dedicated team of 2 committed providers can be trained in operation research with the mentorship from the 3 professional associations. An example of the operation research can be accessed on the following link: (https://www.youtube.com/channel/UC9ZRuVhbrxJm5xAjUHwo6Hw).

LONG TERM

Obstetric Surgical Skills and Emergencies (OSSE) fellowship for non-specialists [GPs, Non-Physician Anesthetists, and Recovery or Operating Room Nurses]

As CS and other obstetrics surgical skills (perineal repair, cervical repair, etc) are currently performed by non-specialists, we recommend to arrange a specific training in form of a one-year fellowship or shorter OSSE course for leaders in obstetrics at DHs (for 2 GPs, 2 Non-Physician Anesthetists, and 2 Recovery or Operating Room Nurse) in collaboration with the Teaching Hospitals and the University of Rwanda.

This training may include online didactic teaching, rotation at referral hospitals, and mentorship by specialists once back at DHs. This model is feasible as it is being implemented by the College of Surgeons of East, Central and Southern Africa (COSECSA) surgery fellowship programs (http://www.cosecsa.org/fcs). This model would also benefit the hospitals as it would allow students to stay in their current clinical roles while improving their academic capacity.

This effective intervention may be expensive at the beginning but has the potential to be sustainable and low cost in the long run as trained personnel will stay at the DHs to train other staff (GPs, Non-Physician Anesthetists, and Recovery or Operating Room Nurses). Finally, there will be an improvement in the safety of childbirth at DHs due to the input of these trained staff.

In addition, Rwanda needs to increase the number of obstetricians from less than 100 now to 960 by 2030 to achieve the Lancet Commission on Global Surgery (LCoGS) target of 20/100,000 Surgeons Obstetricians Anesthesiologists, however, this is not feasible with the current teaching capacity of about 10 graduates each year, the Obstetric Surgical Skills and Emergencies fellowship for non-specialists seems to be a feasible and cost-effective alternative.

Obstetric Surgical Skills and Emergencies (OSSE) certification program for non-specialists [GPs, Non-Physician Anesthetists, and Recovery or Operating Room Nurses]

This program will ensure that any non-specialist meet certain competencies as demonstrated during a written exam and skills exam during a simulated environment. The exam may be done annually or sooner if the non-specialist shows signs of poor performance causing poor patient outcomes.

The hospitals would have to support all concerned professionals (GPs, Non-Physician Anesthetists, and Recovery or Operating Room Nurses) to prepare adequately those exams with teaching materials (mainly online) and hands-on practice through the support of the 3 Professional bodies and local education and patient safety teams.

Recommendation

Given that the 4 options proposed have a potential to impact considerably the quality of maternal care and to decrease maternal mortality in district hospitals in Rwanda, we recommend to start with the implementation of the 2 short-term alternatives respectively the Obstetrics Surgical Skills and Emergencies short course and use of guidelines as they need less budget and planning. Then, for sustainability, the 2 long-term alternatives, the Obstetrics Surgical Skills, and Emergencies fellowship and certification programs for non-specialists should be implemented after consulting all concerned stakeholders and developing a detailed plan.

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Appendix: *Examples of available courses online*

Courses	Website
ACLS/PALS/BLS, First Aid, and Blood Borne Pathogens courses	https://nhcps.com/
Obstetric Simulation-based Course (Touch surgery)	https://www.touchsurgery.com/simulations/cesarean-section
SAFE obstetric course	http://www.e-safe-anaesthesia.org/
Help Baby Breathe	https://www.aap.org/en-us/advocacy-and-policy/aap-health-initiatives/helping-babies-survive/Pages/Course-Materials.aspx
Help Mother Survive	https://hms.jhpiego.org/training-materials/
Non-Technical Skills for Surgeons (NOTSS)	https://www.rcsed.ac.uk/professional-support-development-resources/learning-resources/non-technical-skills-for-surgeons-notss/notss-for-trainees
WFSA tutorial of the week	https://www.wfsahq.org/resources/anaesthesia-tutorial-of-the-week
Operation research course	http://origin.theunion.org/what-we-do/courses/online-and-multimedia-training/sort-it

Original Article

Open Access

Prevention of Mother-to-Child Transmission (PMTCT) of HIV in Karongi District, Rwanda: A Success Story

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ABSTRACT

INTRODUCTION: Prevention of mother-to-child transmission (PMTCT) is a key strategy in programs aiming to prevent HIV transmission from mother to child. Rwanda adopted this program since 2010 and scaled it up in all public health facilities including health centers (HCs). Over all, Karongi District hospitals and its health centers recorded consistent decreases of HIV transmission rates from mothers to children. This article assesses and summarizes Karongi's success story.

METHODS: Data were abstracted from routine Health Management Information System (HMIS) for the period between July 2010 to June 2019. The target population was women attending PMTCT services. Data analyses we preformed using excel and proportions were presented. The outcome of interest was the proportion of infected children born to HIV-positive mothers.

RESULTS: A total of 92,366 pregnant women attended PMTCT services in Karongi District, from 2010-2019. A proportion of 83.5% of them were accompanied by their husbands for PMTCT services. The HIV prevalence among pregnant women attending ANC services decreased from 2.7% in 2010 to 0.3% in 2019; the rate among sub-districts varied between 0.011% in 2010 and 0.003% in 2019. Kibuye sub-district recorded the highest number of HIV-positive women from 2010 to 2019 (460). During labor, in the study period, 45,118 pregnant women attended maternity services in Karongi District; among them 113 (0.25%) had HIV-positive tests. One HIV transmission was registered in 2019. From 2010, among exposed infants, 22 have been HIV-infected through MTCT at 8 weeks or 18 months. The transmission rate in 2019 (a single case), for the considered period, was 0.12%.

CONCLUSION: PMTCT succeeded in Karongi District. This success of elimination of HIV transmission from mother-to-child should be sustained. In this context, HIV-free generation can be expected.

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Received: January 02, 2020
Accepted: September 12, 2020
Published:September 30, 2020

Cite this article as: Mutagoma et al. Prevention of Mother-to-Child Transmission (PMTCT) of HIV in Karongi District, Rwanda: A Success Story. *Rw. Public Health Bul. 2020. 2 (3): 30-35.*

INTRODUCTION

Human Immunodeficiency Virus (HIV) is a Sexually Transmitted Infection (STI), that can also be transmitted from mother-to-child during pregnancy, delivery and/or breast feeding. Globally, vertical HIV transmission contributes to 9% of HIV new infections [3]. In breastfeeding population, this transmission can be reduced to less than 5% and less than 2% in non-breastfeeding population [3]. The mother to-child transmission of HIV is public health problem, but with sustained and coordinated efforts, infections acquired through this transmission route can be averted.

On the other hand, without intervention the MTCT of HIV was estimated at 5 to 20% [1] but WHO

estimated the risk of MTCT from 15-45% [2]. Antiretroviral treatment (ART) reversed the trend of MTCT among women having this treatment. The idea of elimination through MTCT is possible if the coverage of ART among pregnant women is increased and sustained. The World Health Organization initiated the program to eliminate mother to-child transmission of HIV [3,4]. United Nations General Assembly (UNGASS), through country members, was committed to reduce by 50% MTCT by 2010 assuming that 80% of pregnant women will get ART [4]. Despite invested efforts to eliminate MTCT of HIV, the issue is persisting. In United Kingdom, from 2000-2006, the MTCT rate was estimated at 1.2% [5].

In UK, from 2006 to 2013, MTCT declined from 1.2% to 0.4% [6]. In African countries the HIV-infection trough MTCT is still high. For instance, in South Africa, PMTCT assessment reported that 3.5% of infants were infected in 2010, the following year the MTCT of HIV was estimated at 2.7% [7]. In Kenya, a study conducted in PMTCT intervention in 2010 revealed that 5.3% of infants born to HIV-infected mothers were HIV-infected [8]. A previous study conducted in the west of Kenya reported that MTCT of HIV was 8.1% at three months and 14.9% at 18 months [9]. In the same period in Uganda, MPTCT was estimated at 15.5% [10]. Similarly, a systematic review conducted in Ethiopia showed that MTCT of HIV ranged from 4.2% to 15.7% [11].

In Rwanda, remarkable intervention has been implemented in fighting against HIV among pregnant women. Universal coverage of HIV testing and treatment of HIV for pregnant women in antenatal care (ANC) services in the country. The prevalence of HIV among pregnant women attending ANC was 2.4% in 2017-2018 [12]; and in one decade MTCT decreased from 6.9% in 2009 to 1.5% in 2019 [12,13]. There is paucity of data of MTCT of HIV at the scale of district. However, this prevalence was estimated in few health facilities. In Muhima Health Center MTCT transmission was estimated at 11.5% in 2009 [14], a researcher conducted a study in health facilities in Kigali and found that the MTCT transmission rate was 2.2% [15].

Aim

To provide an overview on PMTCT program in Karongi District and its success story.

Objectives

To analyze PMTCT uptake in Karongi District

To analyze and report on the outcome of PMTCT services in the reduction of MTCT in Karongi District over the reporting period.

METHODS

Study design: A retrospective study, using secondary data extracted from the HMIS database at Karongi District level.

Target population: The principle investigator extracted data from an existing database (HMIS) from 2010 to 2019. Analyses were performed on aggregated data; Rwanda's current HMIS does not report patient level data. All reported women who attended PMTCT services, and babies born from those women were reported. The outcome of interest was the number of infected children whose mothers were in the PMTCT program and were infected. An infected child was included in the study regardless their point of infection: during birth or after birth (e.g.: might have acquired infection during breast feeding). Karongi District has two district hospitals (Mugonero and Kirinda district hospital) and one referral hospital (Kibuye Referral Hospital). Catchment areas of the mentioned hospitals are recorded as sub-districts in HMIS.

Inclusion criteria: All women who attended PMTCT services, and their babies reported from 2010 to 2019.

Sample size: We used a take all approach for the defined study period. A total of 92,366 pregnant women were included.

Data collection data collection tools: The investigator considered two main elements: Pregnant women in ANC with known HIV-statuses, pregnant women in ANC with unknown HIV statuses attending PMTCT services and pregnant women with unknown HIV statuses recipients of maternity services (Figure 1).

We exported data from the HMIS database system to Microsoft Excel for visualization and analysis.

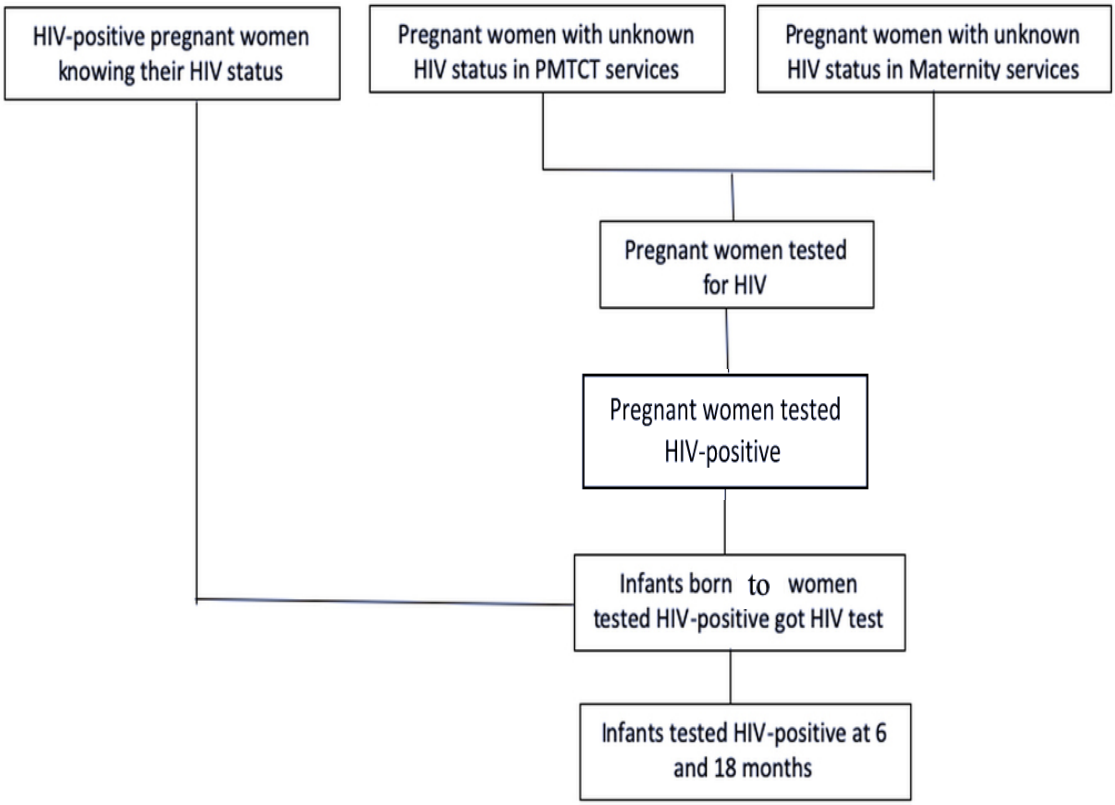

Figure 1: *Participants flow to select MTCT HIV transmission*

Data analysis: Microsoft excel was used to compute descriptive data analyses. Proportions were presented in tables and graphs.

Ethics considerations: Data was extracted from a routine reporting system, the Health Management Information System (HMIS) and there were no individual level interactions, as well as no personnel information recorded and accessible in the system.

RESULTS

Table 1 below displays the trend of women attending PMTCT services in Karongi District, by sub-districts corresponding to catchment areas of three hospitals in Karongi District.

Kibuye sub-district recorded many pregnant women compared to other two sub-districts. The highest number was recorded in 2013 (11,305). The total cumulative number of women in this study was 92,366 women.

Table 1: *Pregnant women with unknown HIV status tested for HIV in PMTCT service over time in Karongi District.*

Sub-District / Period	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
Kibuye	2296	5203	5673	6252	5087	5666	5802	5694	5672	3094	50439
Kirinda	1329	3225	2988	2611	2020	2303	2489	2345	2309	1038	22657
Mugonero	765	1977	2309	2442	1868	2313	2411	2091	2181	913	19270
Total attendees	4390	10405	10970	11305	8975	10282	10702	10130	10162	5045	92366
Total HIV positive	119	118	154	143	61	56	80	39	45	16	831
Total HIV prevalence	2.71	1.13	1.40	1.26	0.68	0.54	0.75	0.38	0.44	0.32	NA

For the mentioned period, the cumulative HIV prevalence was 0.90%.

Data in table one shows that the trend of HIV prevalence in the mentioned study period was on a considerable decrease from 2.7% in 2010 to 0.3% in 2019.

Overall, the number of pregnant women attending ANC services who tested positive for HIV infection decreased from 2010 to 2019. Kibuye sub-district recorded the highest number of HIV-positive pregnant women from 2010 to 2019 (460), while Mugonero sub-District recorded the lowest number (160). In total 831 HIV-positive pregnant women were recorded in Karongi District with an observed peak (154 positive cases) in 2012 (Figure 2).

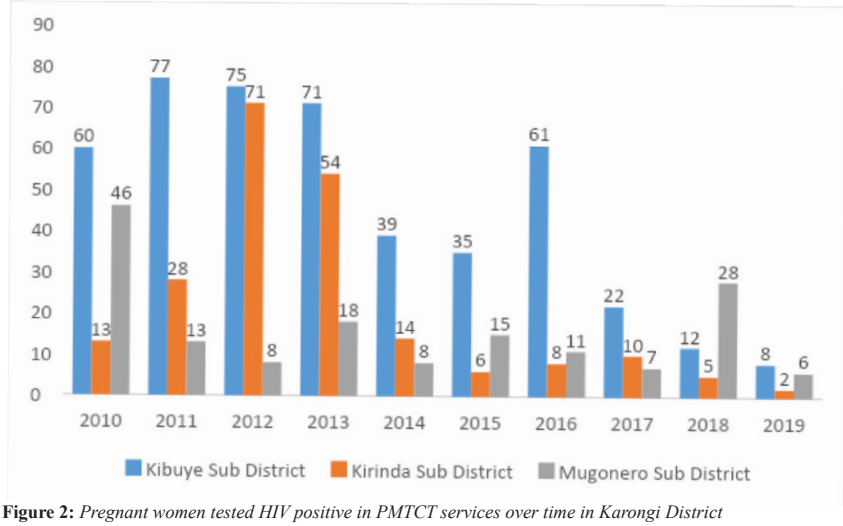

Figure 2: *Pregnant women tested HIV positive in PMTCT services over time in Karongi District*

The figure 3 shows numbers of pregnant women who attended PMTCT services during labor in the tree sub-districts. Overall, Kibuye sub-district had the highest number of attendees. From 2014, Mugonero sub-district had slight raises although not at the level of Kibuye Hospital. In the same year, Kirinda showed constant levels with small rises in 2017.

The lowest number of pregnant women tested for HIV during labor dropped down in 2014.

In the designed period, 45,118 pregnant women attended maternity services during labor in Karongi District, among them 113 (0.25%) became HIV-positive (Figure 3).

At 6 weeks or 18 months, from 2010, among exposed infants, 22 were HIV-infected through MTCT. The transmission rate for the whole period was 2.65%. In the last five years, the transmission rate was 0.00% except one case of HIV transmission over 831 HIV-positive pregnant women (0.12%), recorded in 2019.

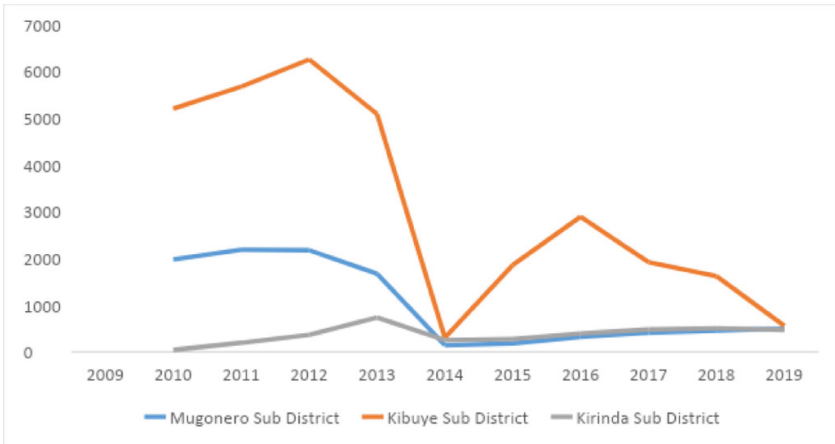

Figure 3: *Number of women with unknown HIV status tested for HIV during labor in Karongi District over time*

DISCUSSION

In Rwanda, all public Health Centers and all hospitals are involved in PMTCT program; test-and-treat approach is used and appropriate prophylaxis to newborn [22]. The total number of pregnant women attending ANC services was high in the last decade. Pregnant women are systematically encouraged to attend ANC and PMTC (where applicable) services and they are also requested to deliver at a health facility.
Data were abstracted from a decade back from pregnant women attending PMTCT and maternity services in Karongi District.

From 2015 to 2018, there was no single MTCT, the transmission rate was 0.0%. In 2019, one MTCT over 97 newborns (1.0%) was recorded. This is a big achievement compared to expected MTCT HIV transmission without intervention (15-45%) [3]. This MTCT prevalence reported in this assessment is lower compared to MTCT national findings reporting a prevalence of (1.9%) [12].
The purpose of PMTCT program is to avert the transmission of HIV infection from a pregnant woman to child. The success of this program depends on administrating ART to all HIV-positive pregnant women. The PMTCT intervention was the major factor to reduce MTCT in Karongi District [13].

Kibuye sub-district has the biggest number of attendees due to its catchment area. It covers many HCs, and major urban settings, whereas, the remaining sub-districts (Kirinda and Mugonero) are totally rural. This could explain why the number of pregnant women registered in Kibuye sub-district in higher compared to Mugonero and Kirinda sub-districts.
There is an apparent decline of HIV among pregnant women (from 2.7% in 2010 to 0.3% in 2019). The decline of HIV among pregnant women could be attributed to the low prevalence of younger women (less than 24 years) compared to older pregnant women (older than 24 year) [17]. This prevalence in much lower compared to the national prevalence of HIV among pregnant women attending ANC services (2.4%) across the country [12]. Our finding is not similar to the general consistent decrease of HIV infections in pregnant women observed and recorded in the African region from 2003 to 2012 [16]: From 4.3% to 2.9% in the West African region, From 3.6% to 2.9% in the East African region and 17.3% to 16.1% in Southern Africa [16]. The main factor of the general decline of HIV among pregnant women could be the scaling up of HIV treatment and increased awareness of HIV prevention.

The HIV prevalence among pregnant women in Karongi District is a bit lower (0.3%) compared to HIV prevalence for the same population at Muhima Hospital, Kigali, Rwanda; 3.7% and 3.2% at 6 weeks and 6 months respectively [14]. For instance, in Tanzania from 2002 to 2011, it declined from 5.6% to 4.6% in Kagera region, and from 7.1% to 5.5% for Mtwara [17] while it was 6.9% in Western Kenya [18].
The one MTCT case observed between in 2019 was due to the not up-taking ARTs, and not attending her ANC programs; leading her to a home delivery with no trained birth attendants.

The study used existing routine collected data from an aggregated data source. Some information could not be found in the existing database. We used data collected from a small scale in the country (only one district); lack of similar small-scaled studies did not allow holistic comparisons.

In conclusion, the number of pregnant women tested in delivery room dropped down in 2014 due to new HIV guideline for pregnant women requiring all pregnant women to be tested during ANC visits compared to the former guideline where women were only tested during labor/ delivery.

Although the PMTCT program in Karongi District succeeded to consistently reduce HIV MTCT, there is still need for improvement to achieve zero MTCT. This can only be possible through mutual collaborations between health care providers and HIV pregnant women as well as a continuous provision of counseling services among infected HIV women of reproductive age. It is only in this context that a HIV-free generation can be created.

Acknowledgments

We acknowledge the contribution of the leaders of the Ministry of Health for the data management system; health facilities (HCs and hospitals) in Karongi District for their daily dedication for HIV prevention.

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Rwanda
Public Health Bulletin

About the Rwanda Public Health Bulletin (RPHB)

The Rwanda Public Health Bulletin (RPHB) is a printed and open access, peer-reviewed journal, published as the flagship scientific and technical periodical publication. RPHB is a public health bulletin launched in March 2019 by the Rwandan Ministry of Health, through the Rwanda Biomedical Centre (RBC) in collaboration with the Centres for Disease Control and Prevention Foundation and with support from Bloomberg Philanthropies Data for Health Initiative.

Mission

To serve as a scientific information dissemination platform of national and international significance, mainly in areas related to the Rwanda Ministry of Health's essential mission to strengthen national and local health systems and improve the health of the people of Rwanda. The Rwanda Public Health Bulletin publishes disease surveillance summaries, public health response guidelines, public health notices, case reports, outbreak reports, original research papers, and policy briefs among others. It generally features issues of importance to its targeted audience which is health professionals, academic researchers, policymakers and anybody interested in health issues. Articles for publication are received from doctors, nurses, allied health professionals, students, policymakers, government bodies, non-governmental bodies and others.

Aim

To bridge the gap in public health information sharing between policy-makers, researchers, health professionals and practitioners.

Publisher

RPHB is a publication of the Rwanda Health Communication Centre (RHCC) which is the communication arm of the Rwanda Ministry of Health's and operating under the Rwanda Biomedical Centre (RBC).

Registration

Online ISSN: 2663 - 4651, Print ISSN: 2663 - 4643

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INSTRUCTIONS TO AUTHORS

All works submitted to this bulletin will have to belong to the types of articles stated below:

1. ORIGINAL RESEARCH

Referred to as "Primary Research" pioneer in a determined domain. It can be from various aspects: Clinical features, pathophysiology, biochemistry, molecular biology, etc...

THE TITLE

The title of the article should be concise and informative. It should contain enough thoughts on the subject.

ABSTRACT

Abstract of 250 words maximum must accompany each manuscript and be divided into 4 paragraphs with the following headings and MeSH keywords:

Introduction: stating the purposes/aims of the work; the research undertaken, the hypothesis tested or the procedure evaluated.
Materials and methods: briefly stating what was done and what materials were used, including the number of subjects, the methods to assess the data and to control bias.
Results: Providing key findings of the study, including indicators of statistical significance, actual numbers, as well as percentages.
Conclusion: Summarizing in 1 or 2 sentences the work on the basis of the findings. It emphasizes new and important aspects of the study or observations.

THE MAIN TEXT

The text of observational and experimental articles is divided into sections with the following headings: Introduction: should always begin the text, and requires brevity and focuses. It conveys the nature and purpose of the work, and quotes the relevant literature. Only strictly pertinent background information is necessary for understanding why the topic is important. We suggest the final paragraph clearly states the hypothesis or purpose of the study.

METHODS

Details of clinical and technical procedures should follow the introduction. A clear description of the selection of the observational or experimental subjects should be given. The identification of all aspects of the study, its reasoning, and the related relevance should be explicitly justified. In case, the study was done in a particular way, the guiding principles should all be clarified. Exclusion and inclusion criteria or partial inclusion, the reliability index, the confidentiality index, the analysis step, and the data collection processes should be also carefully specified. This section should provide sufficient details on the methods, instrumentation, procedures, all drugs and chemicals used (including generic names, doses, routes of administration). It should allow other workers to reproduce the study if necessary.
This section should also state the self-evaluation of the study by: independent/consensus readings blinded or unblinded to other information and estimate the fluctuation of recall biases by random ordering of studies.

Be clear about the retrospective or prospective nature of the study. Finally, provide references to established methods, including statistical methods that have been published, forthcoming, or that may not be well known. New description or substantially modified methods may be used however, give reasons for the use of these techniques, and evaluate their limitations. Statistical methods should be described with enough details to enable a knowledgeable reader with access to the original data to verify the reported results. A general description of methods would be defined in the methods section, whereas a specific statistical method used into analysis would be summarized in the results section. Any general-use of the computer program should be

specified, and more details have to be clarified about any randomization issues.

RESULTS

Logical sequence of presentation of results is required in the text; along with tables, and illustrations. Repetition of data from illustrations into the text should be avoided; however, emphasize or summary of only important observations would be helpful. Avoid the ‘’non-technical use’’ of technical terms in statistics which should be defined and reserved for the right purpose. Moreover, define all those statistical terms aside with or including abbreviations and/or most used symbols. Any complication and/or unexpected finding should be reported and the more possibly explained and the author should report lost to follow up and dropouts from a clinical trial.

DISCUSSION

Use ample subheadings. Emphasize the new and important aspects of the study and the conclusions that follow from them. Avoid repetition of details included in other parts. This section requires the mention of the implication of the findings, and their limitations for future research, involving relating the observations to other relevant studies.

Finally, the conclusions should be linked to the goals of the study; though mostly avoiding:

Unqualified statement not completely supported by the data

Statement on economic benefits and costs unless the report includes economic data and analyses

Claim of priority and alluding to work that has not been completed.

Whereas new hypotheses could be suggested when warranted, but they should be clearly labeled as such and recommendations, when appropriate and needed, may be given.

Acknowledgments

List all contributors who do not meet the criteria of authorship, such as those who provided purely technical help, writing assistance, or a department chair who provided only general support; and their respective contribution will be headed as provided. Everybody must have given written permission to be acknowledged. References: References should be numbered consecutively in the order in which they were first mentioned in the text. They will be identified in the text, tables, and legends by arabic numbers. This bulletin uses the IEEE style (Institute of Electrical and Electronics Engineers) for referencing the citations. It is advised to avoid citations or personal communication unless they provide essential and pertinent information. In all case, the name of the person and date of communication should be cited in parentheses in the text.

2. CHECKLIST FOR SURVEILLANCE REPORTS

Disease surveillance summaries are reported following the checklist below:
Title: Compose a title that includes the name of the health condition, population, time and place.
Abstract: Provide a structured abstract including the following sub- headings: Background; Objectives; Methods; Results; and Conclusion. Introduction
Context: Summarize the current situation regarding the health condition under surveillance and identify why it is important. Objectives: State the objective of the surveillance report.

METHODS

Setting: Describe the setting, locations and dates of the surveillance period.
Population: Describe the population under surveillance. Definitions: Provide definitions for each health event under surveillance, including case definitions and any public health interventions.

Information sources: Describe all data sources, including the objective of any surveillance systems, what data were collected and how data were gathered, transferred and stored. Supplementary data: If appropriate, note where to access supplemental material (e.g., www.opendata.gc.ca).

Data quality, missing data and reporting delays Describe how the data quality was assessed. Explain how missing data were addressed. If data is reported by date of diagnosis or symptom onset, include a statement about whether the data for the most recent periods may be revised.

DATA ANALYSIS

Describe any analytical methods used providing sufficient detail to enable a knowledgeable reader with access to the original data to judge its appropriateness and to assess the reported results.

RESULTS

Descriptive: Provide a summary of the descriptive data, including demographics.
Data Quality: Report on data quality (e.g., completeness, missing data, under reporting)
Analytic data: Provide a summary of the analysis including (when indicated) estimates of trends. When applicable, point estimates should include appropriate indicators of measurement error such as 95% confidence intervals (e.g., average annual percentage change used to describe trends or odds ratios used to describe subgroup differences).
Figures: Create the minimum number of figures to highlight key results. Create a title that includes person, time and place.

DISCUSSION

Key results: Summarize key results with reference to study objectives
Comparison: Consider these findings in relation to the current literature. Strengths and weaknesses: Discuss the strengths and weaknesses of the study (data quality, completeness, sources of potential bias). Interpretation and generalizability: Provide a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies and other relevant evidence.
Conclusion: Ensure conclusions address objective and follow from the results.

3. PUBLIC HEALTH NOTICES / OUTBREAK REPORTS

Following the Center for Disease Control recommendations, for PH notices and outbreak reports to be published they need to cover all four components as stated below:

INTRODUCTION

Generally, the introductory paragraph should begin with 1 to 3 sentences establishing the existence of the outbreak or underlying public health problem (e.g., On January 2, 2008, the Nevada State Health Division contacted CDC concerning surveillance reports received regarding two persons recently diagnosed with acute hepatitis C.). The introductory paragraph also usually contains: a) a statement that an investigation was conducted, when and by whom; b) the most important finding(s); c) the actions taken to stem the outbreak; and d) a statement of the public health implications and actions that should be taken in response to the investigation. Investigation and results: First, present the initial investigation and its findings. This might include: 1) a description of the setting and a statement of how the outbreak came to the attention of health authorities; 2) a clinical description of the index case or initial cases; 3) initial key test results; and 4) hypothesis generation activities and results. Next, summarize the full investigation, including: case definition, case-finding activities, method of investigation, and results. Cases should be counted and described by clinical characteristics, treatment, and outcome, as well as time, place, and person descriptive results. Next, present the methods and results of any analytic epidemiologic studies (e.g.,

cohort or case-control studies). Finally, provide the results of any relevant microbiologic, genetic, or toxicologic results, followed by the results of any testing of environmental samples. Public health response: When appropriate, a brief description summarizing any public health interventions taken and the results of the interventions follows.

DISCUSSION

Same as for a Full Report, except that a Limitations paragraph might not be required for an Outbreak Report.

4. POLICY BRIEFS

This bulletin will use guidelines on reporting/ publishing policy notes as they are suggested by the Center for Disease Control (CDC). As the CDC defines them; Policy Notes are intended to announce new official policies or recommendations (e.g., from ACIP or CDC). These reports can be thought of as briefs. Maximum word count at submission is 1,400 words. Up to three tables, figures, or boxes may be included. Policy Notes contain no Discussion or Limitations, and a summary box is not required. Although policy notes or brief might vary, following is a rough guide of what basic notes should have: Introduction: The introductory paragraph should be limited to 150–200 words. It might contain all or some of the following components: a brief introductory statement orienting the reader to the topic and placing it in context, a brief description of the public health problem, a brief statement of the rationale for the policy or recommendation, mention of the most important parts of the policy or recommendations, and one or two sentences stating the conclusions and the public health implications of the new policy or recommendations.

BACKGROUND

The Policy Note should include a paragraph after the introduction that summarizes background information relevant to the policy or recommendation that can help the reader understand the context and need for the policy or recommendation.

Methods: Should include a summary of the methods used to establish the policy or recommendation, including answers to some or all of these questions: Who was involved in the production of the guidelines or recommendations, and how? What evidence base was considered? What was the rationale for considering this evidence base? Was other evidence excluded from consideration and, if so, why? Rationale and evidence: The Policy Note should provide a concise review of the rationale for the policy or recommendation and a descriptive review of the scientific evidence used to establish it. It should include an explanation of how the policy or recommendation adds to, or differs from, relevant policies or recommendations established previously. Presentation of the policy or recommendation: The policy or recommendation should state clearly when it takes effect and to whom and under what circumstances it applies.

DISCUSSION OR COMMENT

The Policy Note should comment on the likely impact of the new policy or recommendation and plans for assessment of the policy or recommendation

5. CASE REPORTS

These are reports of an individual patient on their symptoms, treatment reactions on a disease or condition of interest. These reports normally focus on unusual reactions or occurrences. Similar to other research reports, case reports might include a literature review of previous similar. Case reports might also address positive patient outcome on particular treatment guidelines or individual impact of a particular intervention. These are mainly used for educational and decision-making purposes. Case reports are normally reported following a checklist found at the CARE Guidelines.

6. CASE STUDIES

We recommend authors to follow the "EQUATOR Network" for ample explanations and guidelines in the writing of such articles. They have to be well-described case studies on health care interventions of public health concern. These could be:

Rigorous assessments of processes and program interventions.

Recommendations on possible health interventions.

Never on individual patient (= case report)

7. COMMENTARIES / OPINION / METHODOLOGY ARTICLES

We recommend authors to follow the "EQUATOR Network" for ample explanations and guidelines in the writing of such articles. Though these articles are moderated, they should be:

Short, focused, opinionated to previous articles or any subject related to the journal entirely.

Contemporary and focusing on specific issues.

Frank critics to the journal are bravely motivated and would be as much as possible published.

Are normally up to 800 words.

8. FORMATTING THE MANUSCRIPT

Please note that Articles which are not correctly formatted will be returned to the authors
Format text: Style: No Spacing, Single column, Single Spacing
Font: Single Spacing, Times New Roman - size 12
Titles: Capitals and bold, size 14
Format tables: Times New Roman, Font size 9
No vertical lines. Horizontal lines in the table can be removed
No table should be larger than a single A4 page.
Footnote should be size 9 and italic

Rwanda
Public Health Bulletin

Publisher

Rwanda Health Communication Centre.

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Acknowledgement

This publication, [Rwanda Public Health Bulletin (RPHB)], was made possible by financial support from the Bloomberg Philanthropies Data for Health Initiative through the CDC Foundation. Its contents are solely the responsibility of the authors and don't necessarily represent the official views of Bloomberg Philanthropies, the CDC Foundation or the U.S. Centers for Disease Control and Prevention.