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# Global Health: Annual Review

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McMaster University

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# Letter to the Reader

Dear Reader,

Welcome to the fifth issue of the *Global Health: Annual Review* (*GHAR*), McMaster University's open-access journal for students, graduates, and young professionals in the field of global health to share their work. The journal began as an initiative taken on by the alumni of Master of Science in Global Health Program at McMaster University to provide a platform to share scholarly work. Since 2015, *GHAR* has continued to expand the global health community, receiving works focused on improving the quality of life at an individual, community, and societal level across the globe. For this year's issue, the editorial team has widened our submission criteria and updated our review process, and we are proud to present almost thirty articles for your enjoyment and learning!

In this issue, you will find that our articles touch each part of the global health field comprehensively, demonstrating the intersectionality between infectious disease, environmental health, and health equity. Beginning with the emerging challenges, insights, and approaches to management of infectious disease burden and preparedness for future outbreaks. The health-centred perspectives on environmental threats, water and sanitation access, and implications of climate change is an important driver of infectious disease transmission and health equity. Access to equitable care is important to understand deficiencies in the system and strategies to further improve care for vulnerable populations. Importantly, we want to highlight the challenges of equity and access as they pertain to Reproductive, Maternal, Newborn, and Child Health (RMNCH) around the world. To conclude our journal, we are excited to showcase critical health challenges in Canada with a focus on vulnerable and underserved populations.

Each article will give you a glimpse into a new world of theory and practice, spanning multiple disciplines and intellectual frameworks. We hope that you will leave with a better understanding of the diversity of global health research, its obstacles, and the efforts being taken to promote human flourishing across the globe. On behalf of the authors and the entire editorial team, we thank you for your continued interest and support in our journal.

Sincerely,

The *Global Health: Annual Review* Issue 5 Editorial Team

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## Editors

**Alana Changoor** holds an M.Sc. Global Health from McMaster University. She currently works as a Program Associate at Assist International, supporting their COVID-19 tele-education programming for healthcare workers in the Global South. Her interests include maternal, newborn and child health, and she is passionate about health and gender equity.

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# ACKNOWLEDGMENTS

*THANK YOU FOR YOUR CONTRIBUTIONS TO THIS YEAR'S JOURNAL.*

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# Responding to COVID-19: The GHAR Editorial Team's Perspective

Dear Readers,

The research and opinions presented in Issue 5 of the Global Health: Annual Review were conducted and written before the novel coronavirus, COVID-19, changed our perspective of the way we live. Before you begin reading the articles in the fifth issue of our journal, we would like to note the important changes we have seen that directly impact health at an individual, community, and societal level. Conducting global health research will look different now that COVID-19 has affected many programs intended to reduce the long-standing inequities embedded in social determinants of health among the most vulnerable populations. Rather, the COVID-19 pandemic has precipitated power and privilege imbalances, redressing historical inequities related to conflict-trauma, violence, and public health threats [1]. Recalling that the overall goal of global health research is rooted in health equity, we must remember that even in the face of COVID-19, all populations should be cared for.

In the context of Canada, although social data pertaining to race and demographics are not collected and reported for COVID-19, researchers and health professionals can already predict the detrimental impacts it will have on the most vulnerable citizens. Many professionals are comparing the novel coronavirus outbreak to the Spanish Flu of 1918 and the

Influenza A (H1N1) virus pandemic in 2009, where epidemiological studies in H1N1 reported higher hospitalization rates in Indigenous communities and deprived racialized neighbourhoods in Canada [2]. However, pre-existing conditions and access to healthcare did not account for all the observed inequities seen in H1N1 [1,2]. Numerous studies have demonstrated the realization that poverty, inequality, and social determinants of health promote systemic conditions that foster the transmission of diseases, further contributing to unequal burdens of morbidity and mortality [1,3]. For example, vulnerable populations are likely to live with chronic conditions, experience food and housing insecurity, mental health challenges, precarious employment, and low education levels. All of these factors can be defined as long-standing inequities present within our health and education system, contributing to the increase in susceptibility of contracting the disease and exacerbated health outcomes. Therefore, upstream factors such as incorporating mixed-income public housing projects must be considered, like the Housing First initiative which has shown that temporarily moving low-income families to high-income neighbourhoods increases their mental health, builds social capital, and self-efficacy [4,5]. Therefore, we must continue the paradigm shift towards meaningful engagement with disadvantaged groups through partnership, funding, and leadership in order to create equitable policies moving forward.

On a global scale, the economic fallout of the pandemic is already visible among China and other G7 countries. However, even though children and women are not the face of the pandemic, they risk being the most impacted as the economic repercussions will disproportionately impact medical supply chains, vaccines, and education programs within low and middle-income countries. It is estimated that 42 to 66 million children could fall into extreme poverty as a result of the crisis, delaying progress towards achieving Sustainable Development Goals by 2030 [6]. As essential resources and funding are allocated towards the pandemic response, the global health community must not lose sight of traditional topics such as access to education, clean water, and vaccines that can assist in preventable deaths. Despite all the negative impacts of COVID-19, these unprecedented times have demonstrated a greater appreciation towards research and development by funding COVID-19 research programs, promoted awareness of our global carbon footprint, and how global health truly impacts everyone, regardless of location and socioeconomic status. Rather, our focus should be on collaboration, distributing evidence-based knowledge to address the biological, social, behavioural, and contextual factors contributing towards disease transmission. Interdisciplinary collaboration is often preached in global health research, but a global synergistic response was not seen when addressing the spread of COVID-19 in the past six months.

With that, we want you to join us in thanking all the researchers, practitioners, field workers, and essential service workers for their contributions to protecting our society and believing in the practice of global health as we keep going further into the unknown. You were brave to come into the field of global health research, to begin with! Most of all, we are extremely proud to offer you a snapshot of this challenging and necessary work in global health. Enjoy the fifth issue of *Global Health: Annual Review*!

Sincerely,

The *Global Health: Annual Review* Issue 5 Editorial Team

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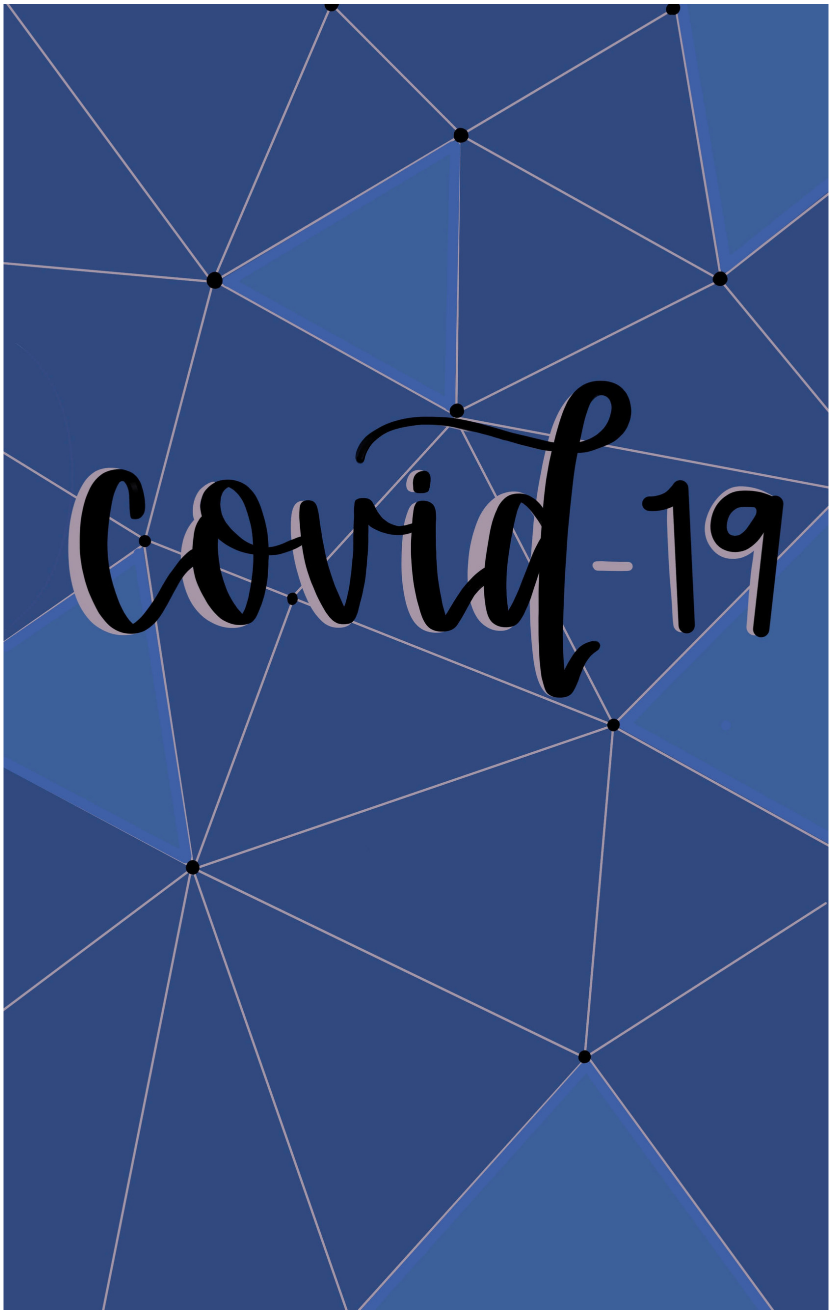

## COVID-19 Connected

*This hand-drawn art work represents how the ongoing COVID-19 pandemic has highlighted the interconnectedness of the world more than ever before. Countries around the world are working to combat the virus and make communities safer for the public. COVID-19 has left its mark on all facets of life: whether this is travel, work or daily living, everything has changed. Working together and learning from one another has helped forge a way forward.*

*Art by Mauli Patel*

# Infectious Diseases

EMERGING CHALLENGES, INSIGHTS, AND APPROACHES TO MANAGEMENT OF INFECTIOUS DISEASE BURDEN AND PREPAREDNESS FOR FUTURE OUTBREAKS.

Photo Courtesy of Tanya Tewari

OPINION EDITORIAL

# Tackling Antimicrobial Resistance in Low-Resource Settings: The Global Development Crisis

**Maja Milkowska-Shibata**, Maastricht University

## THE PROBLEM

With 700,000 annual deaths due to resistant infections today and 10 million lives at risk every year by 2050 [1], antimicrobial resistance (AMR) represents a tremendous global health challenge. Current alarming levels of AMR threaten developments of modern medicine by impeding the use of vital surgical procedures, substantially reducing the successful treatment of infections and diseases, and hindering the development of new medications [2]. Without considerable policy changes, the ever-increasing global antibiotic consumption, which is considered a primary factor boosting AMR, is only expected to continue [3]. Given the serious clinical and socio-economic implications of failing to curb AMR, it is crucial to recognize that these consequences are already affecting and will be more severe in low and middle-income countries (LMICs) (e.g., as demonstrated by numbers of deaths due to AMR (Figure 1) or deepening poverty rates) [4]. The aim of this paper is to outline the main reasons behind the problem of elevated AMR levels in LMICs and their outcomes. Therefore, an integrative literature review was employed to include available evidence of diverse methodologies, including scholarly (i.e., literature reviews, original research articles) and non-scholarly literature (i.e., reports, opinions, correspondence). Relevant sources were identified by searches from PubMed (with the following searched terms used in combination: “antimicrobial resistance”, “antibiotic resistance”, “developing countries”, “low income countries”, “middle income countries”), references from other articles of relevance, as well as based on previous research work of the author (particularly country-specific examples).

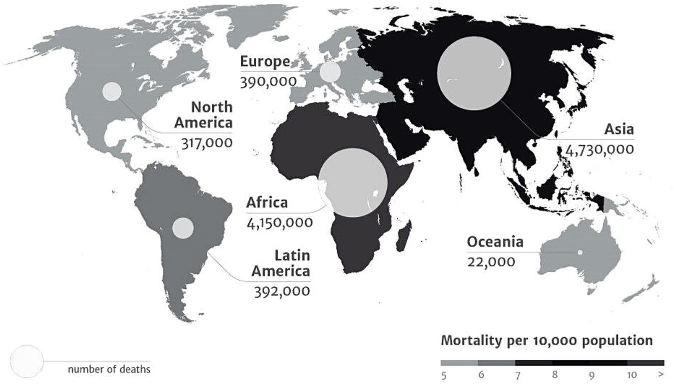

**Figure 1.** Deaths due to AMR every year by 2050 [5].

## DRIVERS OF AMR IN LMICS

From the perspective of global disease incidence, the majority of both human and animal diseases in developing countries are of bacterial etiology, in which growing AMR poses the biggest issue [6]. In addition, the development of resistance to antimalarial drugs and HIV further aggravates the fight against these major health issues faced by nations in LMICs [7]. Considering systemic challenges, while the burden of AMR is difficult to assess, the lack of appropriate national surveillance mechanisms in many low-resource countries render them incapable of measuring its impacts, as well as establishing quantitative and qualitative targets and indicators to tackle it [8]. The use of antimicrobials, the single most important contributor to AMR, is growing rapidly in those countries and increased by 77% between 2000 and

2015 (compared with a modest decrease in high-income countries [HICs]) [3]. At the same time, antibiotic consumption of drugs that should constitute second-choice treatment (as characterized by higher resistance potential) reaches alarmingly high levels in countries, such as Pakistan or India [9-11]. Misuse of antimicrobials in developing countries is often the result of poor market regulations, that for instance allows high sales of fixed-dose combination products in South Asia [11] and substandard and falsified antimicrobials in sub-Saharan Africa [12]. Similar mechanisms apply with regard to the wide availability of antibiotics over the counter, as in the case of the Philippines [13], Syria [14], Egypt [15], Gambia, and Nigeria [16].

Economic constraints are also partly responsible, increasing the likelihood people will seek health care in informal settings and/or self-medicate [17]. On a bigger scale, limited spending on health at a national level typically fails to ensure sufficient coverage of preventive health interventions (e.g., diagnostics, sanitation, vaccinations) that contribute to AMR reduction [18]. Challenges related to limited resources also affect prescription practices. In low resource settings, there may be both low numbers of health professionals per population, and a lack of access to evidence-based information. Healthcare providers in these settings increasingly resort to administering broad-spectrum antibiotics, often without a definitive indication [19]. Antimicrobial use in food animals further contributes to the problem. Antibiotic consumption in animals is projected to increase as meat production, driven by increasing incomes, grows in Africa and Asia [20], and is expected to double in BRIC countries (Brazil, Russia, India, and China) in the next 10-year perspective [21]. At the same time, trends in AMR in animals are not well documented [22] and could be further aggravated by poorer regulations concerning veterinary drugs, lower biosecurity, and poorer-quality feed experienced more commonly in low-resource settings [23]. Another factor hindering the fight against AMR in those countries is the problem of pharmaceutical pollution. The production of most of the world's antibiotics takes place in China and India, where less restrictive environmental regulations allow for the discharge of antibiotic waste into local waters [24]. Such practices, which have been well documented [25-29], have disastrous consequences for the communities with regard to their health status, depletion of natural resources through severe contamination of the environment, and loss of assets including fish stocks or water-intensive agricultural activities [29]. The recently published evaluation on the progress regarding the recommendations of the 2016 Review on Antimicrobial Resistance [30] further states that progress towards curbing AMR in LMICs countries has been unsatisfactory despite numerous initiatives. This is of particular relevance when it comes to reducing antibiotic use in agriculture, and calls for facilitating effective awareness-raising efforts that would result in real behavioural change, and reduction of antibiotic misuse.

## CONCLUSIONS

In light of the above discussion, AMR represents one of the greatest public health challenges of our time, especially in LMICs. However, due to its complex character, it cannot be tackled in isolation from other HICs and the global economy. A collaborative, multi-sectoral, and international approach throughout the supply chain is needed as LMICs require substantial financial and technical assistance in addressing the issue. Reducing the threat of AMR demands the attention of the international community as it impacts the fulfillment of the global sustainable development agenda (from halting good health, to preventing sustainable food production, and increasing social inequalities). As such, addressing the AMR crisis requires reinforcing commitments towards some of the long-existing health and development problems, such as access to water, sanitation, and hygiene, as well as universal health care to reduce the need for antibiotics in the first place and ensure their quality, affordability, and appropriate use when needed. Failing to address this issue means failing to protect basic human rights.

## ACKNOWLEDGEMENTS

*This editorial came into being as a broad reflection on the topics of pharmaceuticals in the environment and AMR during professional experiences at Health Care Without Harm Europe in Brussels, Belgium and the Center for Disease Dynamics, Economics & Policy in Washington, DC, which highly increased my understanding of AMR as a public health and development challenge. I thank Dr. Adela Maghear, Dr. Eili Klein, Dr. Ramanan Laxminarayan, and Katie Tseng for the ability to study these important subjects under their supervision.*

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**OPINION EDITORIAL**

# Why is Polio Still Around?

**Toby Le,** University of Manitoba; **Camille Baycroft,** Western University

Poliovirus is an enterovirus and is the causative agent of poliomyelitis; an acute paralytic disease that results in asymmetric persisting weakness (i.e. acute flaccid paralysis). In 1988, the spread of the virus resulted in 350,000 cases of poliomyelitis and 125 polio-endemic countries [1]. Due to these events, the World Health Organization (WHO) formed the Global Polio Eradication Initiative (GPEI) with the main purpose of eradicating polio through vaccination [2]. Since its launch, GPEI has failed to meet five deadlines to eradicate polio (i.e., 2000, 2005, 2012, 2014, 2018) and has spent over $20 billion USD [3,4]. Through a series of challenges and failures, the initiative now faces a new reality where the vaccine itself is linked to more cases of polio than the wild-type poliovirus [5]. This article will re-evaluate the progress of the GPEI, as well as outline the challenges that it has faced.

Two vaccines are commonly used to prevent polio: an oral polio vaccine (OPV) and an inactivated polio vaccine (IPV). Each vaccine is comprised of three common strains of the wild poliovirus – Sabin strains type 1, type 2, and type 3. The main difference between OPV and IPV is that the former contains the live attenuated poliovirus, whereas the latter contains the killed virus [2]. Previously, the main vaccine used in the GPEI initiative was OPV because of its affordability, ease of administration, and effective induction of intestinal immunity [6]. However, the downside to OPV is that it can recover the neurovirulence and transmissibility of a wild-type virus, termed circulating vaccine-derived polioviruses (cVDPV) [2].

To stop these cVDPVs, the GPEI asked that all countries using the trivalent-OPV (tOPV) switch to the bivalent-OPV (bOPV), as it only contains polio types 1 and 3. The removal of polio type 2 from OPV was well-supported given that the wild-type poliovirus type 2 had not been detected since 1999 [7,8]. However, following this switch, 25 cVDPV-type 2 (cVDPV-2) outbreaks occurred in 13 countries between January 2018 and June 2019 with the target population being children born after the switch (Figure 1) [5].

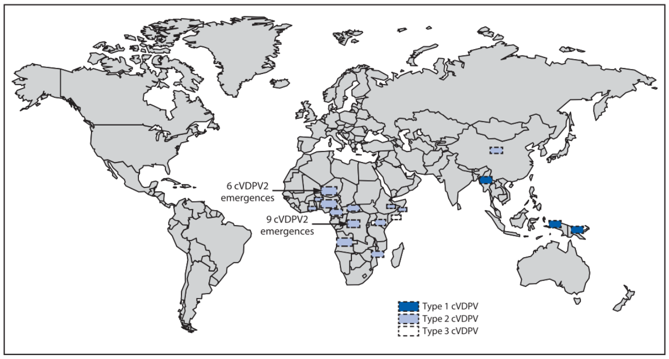

**Figure 1.** Map of circulating vaccine-derived poliovirus (cVDPV) outbreaks types 1, 2, and 3 from Jan 2018 – Jan 2019 [5].

Neglect of research into improving OPV has at least partially contributed to the current cVDPV outbreaks. In 2000, one of the first cVDPV outbreaks was reported in the Dominican Republic. Researchers confirmed 13 cases of vaccine-associated paralytic poliomyelitis (VAPP) that were linked to cVDPV-type 1 [9]. To many researchers, the emergence of these cVDPV outbreaks was perhaps unsurprising given the few attenuating mutations that prevented the vaccine strains from recovering (i.e. six attenuating mutations in OPV strain type 1, two in OPV strain 2, and three in OPV strain 3) [7]. However, such neglect continued on for 50 years and only now are researchers (funded by the Gates Foundation) developing a stable form of

OPV. A possible reason as to why such neglect occurred may be due to its rarity and remoteness from developed countries, contributing to a lack of awareness and thus efforts to address the issue [10,17].

Before the OPV switch, the WHO Strategy Advisory Groups of Experts on Immunization recommended that all countries using tOPV incorporate at least one dose of IPV into their routine immunization programs by 2015 [11]. The purpose of using IPV is to provide enough protection to impede the spread of polio type 2, in the event that it makes a comeback. However, two years after the switch, 28% of countries have yet to include IPV into their routine immunization programs. This may have occurred for two reasons; 1) overoptimistic planning and a lack of communication, as there were undiscussed supply and production setbacks, and 2) a lack of national support into programs aimed at disease control, as only one-third of countries worldwide are developing outbreak programs that meet the standards of the International Health Regulation [12,13].

Furthermore, eradication has been argued to be the wrong approach for combating polio. When eradication of a virus is declared, it refers to the absence in detection of the virus over a 3-year period. Unlike viruses that have been eradicated like small pox, polioviruses can be carried asymptomatically [14]. Thus, failure to detect polio does not guarantee its complete eradication if one considers the silent nature of polio and its capacity to regain pathogenicity and transmissibility (i.e., cVDPV-2). For this reason, many researchers argued that GPEI should have taken on a control approach and focused their effects on routine immunization and diagnostic programs to ensure sustained immunity and reduced polio transmission among children in endemic regions [3,15].

Neglect of different political cultures has also contributed to the failures in the fight against polio. In 2003, when the immunization campaign came to Nigeria, political leaders in Northern Nigeria claimed that ‘the West’ contaminated the polio vaccines with antifertility agents to ‘fight the Muslims’ [16]. The spread of these rumours were fuelled by a political interest to destabilize the running Southern political parties who supported mass vaccination. This propagated a boycott against the immunization campaign that lasted for 15 months and continues to have consequences as Nigeria, which is yet to be polio free [16].

Moving forward, the GPEI’s next major challenge is to re-evaluate its sustainability. For 30 years, the program has relied on international funds to drive its agenda of eliminating polio with a “once-and-for-all” mentality. Without any sustainable plan to achieve the broader health security, its laboratory infrastructures are threatened because of public distrust and decreased funding. Thus, it may be important that future campaigns by the GPEI consider implementing interventions to improve the health literacy of the populations that they are administering vaccines, so to increase public trust. In addition, they may find it useful to engage in reflexive practice strategies, so to learn why shortcomings in previous circumstances have come about.

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OPINION EDITORIAL

# Malaria: A Global Health Disparity Challenge from a Nursing Perspective

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## INTRODUCTION

Malaria is a life-threatening disease that disproportionately impacts children under the age of five [1]. Globally, children under five constitute 67% of all malaria deaths [1]. Currently, inadequate education on malaria prevention and management is evident in both low-income countries such as Nigeria and high-income countries such as Canada, implying an urgent need for a greater effort to address this global issue [1-5]. The purpose of this paper is to highlight the impact of malaria education on children at risk of exposure to malaria. Specifically, this review will identify how countries, such as Canada, may learn from endemic countries, such as Nigeria, to tackle malaria from a social determinants of health approach. Since the promotion of global health and equity is a fundamental nursing mandate, this paper also aims to bring a nursing perspective to addressing malaria education.

## A GLOBAL CONCERN

Malaria remains to be a health issue that requires global attention. Although efforts have been made for more than a decade in fighting malaria, progress has stalled [2]. Between 2010 and 2018, the global incidence rate of malaria declined from 71 to 57 cases per 1000 individuals at risk [2]. However, reduction in cases has slowed and remained at a constant rate since 2014 [2]. This stagnancy in malaria control could be a result of a reduction in donor funding to endemic countries, which compromises the existing disease control efforts and potentially leads to an increase in malaria prevalence [6].

Although malaria is a global concern that threatens the health of people worldwide, children remain the most vulnerable to the detrimental impacts of this disease [1]. In regions with high disease transmission, children, unlike adults, have yet to develop full immunity against malaria [7]. Once infected by malaria, they can develop symptoms such as fever, vomiting, diarrhea, and anemia [7]. Left untreated, these symptoms may quickly progress to death [1].

## A CONCERN IN NIGERIA

Nigeria, bearing the world's greatest malaria burden, is one of the most important stakeholders involved in the combat against malaria [2]. Nigeria, alone, accounts for 25% of global malaria cases and 24% of global malaria deaths, while 97% of its total population is at risk for the disease [2,8].

In Nigeria, children under five alone accounts for more than 70% of all malaria deaths [3]. Delay in seeking medical care is a major contributing factor for this health disparity [3,4]. Malaria is a curable disease, in which prompt diagnosis and treatment is crucial [2]. However in Nigeria, only 22% of children under five with malaria symptoms seek treatment within 24 hours which increases their risk of death [4]. Inadequate parental knowledge of symptoms and thus ability to seek timely treatment is an underlying root cause for treatment delays and resulting risk of mortality [3,4].

Lack of education also impedes efforts by governments and NGOs that supply insecticide-treated mosquito nets (ITNs) and indoor insecticide residual spraying (IRS) for vector control [1,2,5,9]. Persistently, inadequate education for caregivers on the appropriate use of ITNs and IRS can contribute to the insufficient prevention and increased susceptibility of children to infection [1,5]. Overall, the disproportionate burden of disease in Nigerian children highlights education as a leading cause of the problem, that requires immediate attention.

## A CANADIAN CONCERN

While much attention is given to endemic countries, it is also important to examine the situation in high-income countries to understand the health issue in a global context. Unlike Nigeria, returning travellers from malaria-endemic countries account for the majority of malaria cases in Canada [10]. Better access to treatment and efficient surveillance and reporting systems have also contributed to low disease burden [11]. Moreover, physicians in Canada are required by the federal government to report malaria cases and provide access and guidance to malaria treatment [11]. This facilitates the prevention of potential outbreaks and prompt activation of public health actions.

Yet, despite all the strategies implemented to control malaria, there is a growing concern of increasing incidence of malaria in Canada. Climate change, which results in warmer temperatures, higher humidity, and increased rainfall, can increase the population size and longevity of mosquitoes, leading to a high potential for short-lived malaria outbreaks in Canada [12]. There is also an increased trend in travel to endemic areas, inadequate pre-travel education on chemoprophylaxis use and symptom recognition - both of which risk an increased need for parenteral therapy and delay in treatment among Canadians [13,14]. In anticipating an expansion of malaria cases, Canada may learn lessons from countries such as Nigeria to implement measures to strengthen public education on disease prevention and management to reduce the potential impact on vulnerable populations such as children under the age of five.

## IMPLICATIONS FROM A NURSING PERSPECTIVE

To minimize the potential negative impact of malaria, it is important for Canada to recognize the imminent risk for malaria outbreaks and the need for immediate action. Along with immature immunity, a knowledge deficit in malaria prevention and treatment among caregivers can exert a devastating impact on Canadian children during periods of increased disease transmission. Actions such as identifying and tailoring the educational needs for parents will ensure the appropriate use of chemoprophylaxis and timely identification of malaria symptoms. The anticipated increase of malaria burden in Canada reflects the need for greater public awareness of the issue and increased interdisciplinary collaborative efforts among sectors to tackle the health issue. Specifically, the government and health professionals can work together to improve access to pre-travel counselling services and increase the use of chemoprophylaxis and pre-travel education for travellers. Furthermore, the impact of climate change on malaria prevalence suggests the need for a global effort to mitigate global warming and promote sustainable development.

## CONCLUSION

Malaria is an increasingly concerning health issue that requires collective efforts for its eradication. Due to immune immaturity and a lack of caregiver education on malaria management, children under five are the most vulnerable population. Countries like Canada, that have not been faced with the burden of malaria in years, may learn lessons about the root causes of health disparities. International collaboration is necessary to tackle the complex challenge of malaria. Identifying individuals and community needs is an important step towards recognizing and addressing the root causes of malaria.

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OPINION EDITORIAL

# Challenges and Recommendations to Reducing Burden of Diphtheria in Refugee Camps

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## BACKGROUND

As of 2019, 70.8 million people have been forcibly displaced and 25.9 million refugees exist globally [1]. Displacement of a multitude of people from their homes, destruction of infrastructure, and deterioration of health services result from political and economic instability and civil conflicts [2]. Humanitarian efforts that typically involve setting up refugee camps, temporarily provide necessities such as food, shelter, and medical treatment [1]. However, at a rate of one person forcibly displaced every two seconds, refugee camps are overcrowded, poorly ventilated, and limited in their ability to provide adequate access to healthcare. Infectious diseases, such as diphtheria, can thrive at these refugee camps and lead to outbreaks [3-5].

Throughout history, diphtheria has been one of the most feared infectious diseases, causing devastating epidemics [6,7]. Diphtheria was thought to be a disease of the past since a vaccination, diphtheria-purified tetanus-pertussis (DTP), diagnostic tools such as immunochromatographic strip (ICS), and Diphtheria Antitoxin Treatments (DAT) have become commonplace [8-11]. Diphtheria is transmitted through contact of the gram-positive Corynebacterium diphtheriaebacterium in respiratory droplets, resulting in weakness, fever, swollen lymph nodes, and death via obstruction and paralysis [12,13]. Unvaccinated adults and children are most vulnerable, as is the case with incomplete health records of refugees [6,7,14].

Diphtheria, has recently re-emerged and spread rapidly among refugee populations. Cases have been reported worldwide in areas of political instability where unvaccinated individuals tend to decrease herd immunity [12,15]. For example, the Cox Bazaar Refugee Camp in Bangladesh has a population of 914, 998 refugees. A total of 9,037 diphtheria cases (323 confirmed, 2780 probable and 5927 suspected cases) were reported between November 2017 and February 2020 in the camp, with 46 deaths [16].

Preventable infectious disease outbreaks should not be recurring in this way, and countries should be seizing the the potential to eradicate them. Studying the challenges associated with this particular outbreak may guide recommendations to understand barriers to reducing diphtheria burden. Furthermore, in order to promote the human right of good health and wellbeing for all (Sustainable Development Goal 3), it is important to explore diphtheria outbreaks in refugee camps [14]. The purpose of this paper is to: (1) Address the challenges of preventing, diagnosing, treating, and accessing care for diphtheria outbreaks; and (2) Provide recommendations to decrease the global burden of diphtheria in refugee camps, such as by increasing political commitment (PC) and education in host countries.

## CHALLENGES

Challenges of reducing the burden of diphtheria are explored with respect to the prevention, diagnosis, treatment, and care services at the individual, community and national levels (see Table 1).

**Table 1.** Summary Points of the Challenges and Recommendations.

| | |
|---|---|
| **Challenges** | 1. Lack of PC<br>- Cost<br>- Access to health services and resources<br>2. Lack of knowledge & awareness |
| **Recommendations** | 1. Increase PC<br>2. Education |

1. Lack of Political Commitment (PC)

A lack of PC from the host country government of the refugee camp at the national level affects the cost and access to health services.

*Cost:* In preventative terms, diphtheria vaccinations are expensive. Since treatment with DAT is made from human plasma, it is also very costly to both the individual and to the healthcare system. The cost of treatment is also a barrier to reducing the burden of Diphtheria. This is particularly problematic for developing countries that are unable to afford DAT, as they host the majority of the world's refugee camps [17].

*Access to Health Services and Resources:* Access to preventative, diagnostic, and curative services is also a challenge at the individual and community level. The challenge lies in the lack of vaccination posts, a lack of hygiene, and insufficient infrastructure, such as medical clinics, plumbing, and clean water [3,18]. Access to stable power and temperature is important for the storage of vaccinations, diagnostic testing, and treatment [19]. There is a lack of broad coverage because those who most need immunizations are in fragile and difficult to reach environments [3,18]. Additionally, there is a lack of access to ideal diagnostic tools in the community. In low-resource settings, a microscopy examination – insufficient to diagnose diphtheria in diagnosis and treatment [20]. Since most people in a clinical setting – may be the only method available to the clinician [9,20]. Finally, another barrier includes the lack of access to DAT in many countries. DAT is low in supply and unavailable to patients in low-resource settings due to the hindrance of production, low economic viability, and strict regulatory and manufacturing requirements for blood products [9].

2. Lack of Knowledge and Awareness

Barriers to prevention includes vaccine hesitancy, which decreases herd immunity, leaving the overall population at a higher risk for outbreak propagation [3,18]. Additionally, disease rarity is another barrier to diagnosis and treatment [20]. Since most people in the 1940-1980s were immune to diphtheria, it is viewed as low-priority and the "almost forgotten disease" to many clinicians internationally [6,17]. Individually, disease rarity can lead to delayed diagnosis and treatment, increasing the severity of the illness and resulting in increased mortality [21,22].

## RECOMMENDATIONS

Many of the challenges mentioned are interlinked., and therefore recommendations for an effective response are to (1) Increase PC to diphtheria reduction via health system strengthening (HSS) and (2) Education (see Table 1).

Advocacy should be implored to increase the PC to reduce the diphtheria burden in refugee camps. Hosting countries can increase their PC through partnerships with stakeholders such as government officials, non-governmental organizations, and the WHO to ensure HSS [23-25] Organizations like the Alliance in Vaccines (GAVI), founded by WHO, Centers for Disease Control and Prevention (CDC), and the World Bank are committed to improving the rates of vaccination and strengthening the immunization systems [26]. GAVI-initiative, Expanded Program on Immunization (EPI), focuses on a supply system that transports DTP vaccines to low-resource settings. Though there is progress in the EPI, GAVI aims for an even broader coverage of the vaccinations, which is possible if there is PC [3,18,27].

EPI is also cost-effective and greatly reduces the financial burden of DTP vaccinations on individuals [26]. If PC in hosting countries increased, then access to DAT and other less-costly treatments such as monoclonal antibodies could increase as well [9,28]. PC could ensure HSS efforts increase DAT stockpiling, and involve community health workers, helping low-resource refugee camps prepare for diphtheria outbreaks [12]. International partners could also donate doses of DAT to developing countries [17]. Finally, timely diagnosis is vital for diphtheria. HSS would ensure that there is access to accurate diagnostics, ideal for low-resource settings, including ICS [12].

Additionally, ongoing education and training of health workers could address the lack of knowledge and awareness of diphtheria among healthcare providers and the people in these camps [25,26,29]. Education in the form of stakeholder dialogue or community interventions could address vaccine hesitancy, lack of awareness, and thus, expedite diagnosis [24]. It is important to practice cultural humility when participating in awareness campaigns, specifically to work with the community in understanding the benefits [30]. Continuing education is something the healthcare professionals could participate in to address disease rarity [26,29].

## CONCLUSION

Reducing the burden of diphtheria at refugee camps is complex and multi-faceted. Two key opportunities to address this exist: (1) Pressuring the government in host countries to increase their commitment to addressing diphtheria outbreaks. This is needed to facilitate HSS via international partnerships, which would increase access to much needed resources at these camps. Execution of PC plans are imperative. (2) Education and training to address reluctance and lack of awareness or knowledge about diphtheria outbreaks. Important to acknowledge, is that the necessary resources exist to combat diphtheria, and with continued efforts and collective action, eradication of diphtheria in refugee camps will be made possible.

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OPINION EDITORIAL

# The Findings of the National HIV/AIDS Indicator and Impact Survey (NAIIS) Presents an Opportunity for a Pivot in the HIV/AIDS Response in Nigeria

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In March 2019, the Nigerian government in partnership with the U.S. President's Emergency Plan for Human Immunodeficiency Virus (HIV) and Acquired Immune Deficiency Syndrome (AIDS) (PEPFAR) released preliminary findings of the National HIV/AIDS Indicator and Impact Survey (NAIIS), showing that the HIV prevalence in Nigeria is now at 1.4%, with an estimated 1.9 million people living with HIV (PLHIV) [1,2]. This is markedly different from previous reports, which put the national HIV prevalence at 3.0% or an estimated 3.4 million PLHIV. Many had doubted the previous reports because they were based on surveys that mainly included women in antenatal care and over-represented people living in urban settings [3].

The NAIIS findings characterize the country's HIV epidemic more accurately [1,2], and have inspired rejuvenated efforts to meet the once seemingly insurmountable Joint United Nations Programme on HIV/AIDS targets for ending the HIV/AIDS epidemic by 2030 [1]. These efforts have, however, not necessarily addressed current policy and social barriers that hinder equitable access to HIV prevention, testing, and treatment services in a comprehensive way. Stakeholders such as PEPFAR and the Global Fund for AIDS, Tuberculosis and Malaria (GF-ATM) have focused available resources towards intensifying existing active HIV case finding efforts and widespread provision of antiretroviral therapy (ART) in what has been aptly named the HIV surge response [4]. This response aims to diagnose at least 90% of the estimated PLHIV and put at least 90% of those diagnosed on sustained ART [5]. However, if the social and policy barriers are not addressed concurrently, the plan to end the HIV epidemic is not likely to be effective.

To begin, multiple studies have reported that the high level of HIV-related stigma and discrimination faced by PLHIV is one of the most important contributing factors to new HIV infections, poor adherence to ART, and high rates of loss to follow up from treatment programs in Nigeria [6-9]. One study reported that up to 65% of PLHIV experience some form of stigma and discrimination within their communities because of their HIV infection [9], with attrition from ART being as high as 38.3% at 48 months after treatment initiation [10]. Women especially bear the brunt of this pervasive stigma; many express that they experience shame and fear [11,12]. Other women report having to lie to their families and partners while covertly accessing medical care because they risk losing their partners, homes, and livelihood if they disclose their HIV status [11].

Despite this reality, it seems rather counterintuitive that the major component of the HIV surge response plan is identifying active cases by index case testing (ICT) [4]. The premise for ICT is that because HIV is mostly contracted through sexual intercourse, it is cost-efficient to test sexual contacts of PLHIV. Health workers either encourage identified PLHIV to notify their sexual contacts to be tested (passive referral) or with consent, contact sexual partners of existing patients while attempting to maintain confidentiality (provider assisted partner notification) [13].

Opponents have pointed out that this strategy is sometimes not in the interest of the patients who often resist any contact with their partners because of their fear of stigma within the community [14]. They have advocated adopting approaches that uphold human rights to privacy and autonomy in the HIV program, seeking to balance the interests of both patients and their partners [13].

Another limitation of the current HIV response plan is that funding for social behaviour change communication efforts has been on a steady decline over the last decade [9], as more of the funding has been allocated to HIV case finding and treatment efforts. This funding decline has resulted in the drastic decrease of HIV information in contemporary Nigerian media and in poor knowledge about HIV prevention among the public. For example, the 2018 Nigeria Demographic Health Survey reported that only 13% of people aged 15–24 years had a comprehensive knowledge of HIV/AIDS prevention [15], down from 28.9% in 2013 [16]. In fact, there are often misconceptions about the infection that continue to socially isolate PLHIV and spread the infection among younger adults. For instance, there are myths in Nigeria that HIV infections are the result of sin and that there are seemingly miraculous cures to the disease [17]. This often fuels attrition from HIV prevention and treatment programs as people assume that they are beneficiaries of this cure. Propagation of myths like these without a strong public education implies that the cycle of infections is guaranteed to fester.

Similarly, the criminalization of same-sex relationships through the 2014 Same-Sex Prohibition Act has further expanded barriers faced by the LGBTQ+ communities in accessing care [18]. The current response efforts appear to circumvent this issue and instead employ confidential contact tracing methods to reach men who have sex with men [19,20]. The Federal Ministry of Health, however, acknowledges that the depth of the HIV epidemic among men who have sex with men is not yet fully understood. Even with the NAIIS, it has been suggested that the data does not provide enough information on disease burden in this disenfranchised population [1], limiting the public health response.

Proponents of the current HIV surge approach are quick to point out that the strategies for active case finding and treatment as prevention are based on a large body of evidence [21]. They also point out that these strategies are largely the reason for the progress made with diagnosing the number of PLHIV currently on ART. While these are admittedly factual statements, it is important to note that there is limited evidence of the effectiveness of ICT at scale in the Nigerian context [14].

This progress has also come at a significant cost. Ensuring treatment without addressing the systemic social determinants of HIV has resulted in high program attrition rates with increasing risks for widespread HIV drug-resistant infection [22]. Programs have also incurred high operating costs in funding strategies aimed at identifying cases and retaining patients in care without addressing the social barriers highlighted, such that programs often have limited success [8,22]. More of the same approach would be akin to pouring water into a basket. Certainly, the commitment of the Nigerian government, PEPFAR, and GF-ATM to an AIDS-free generation is laudable. However, these organizations require more pragmatic approaches to achieve the ambitious targets of ending the HIV/AIDS epidemic in Nigeria. The NAIIS findings present an opportunity for a program pivot towards more equitable service delivery. In this light, bold strategies and policies that tackle social and systemic barriers to care for PLHIVs, especially programs and policies that support and protect vulnerable populations including young girls, women, and the LGBTQ+ communities, must be adopted. In addition, significant investments in social and behaviour change communication programs that seek to address stigma and discrimination at all social levels are needed to ensure that all PLHIV can freely seek care without fear of consequences.

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OPINION EDITORIAL

# Communication for Synergetic Coordination: A Strategy to Increase Uganda's Infectious Disease Preparedness and Response

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## INTRODUCTION

The last decade witnessed several occurrences of emerging and re-emerging infectious diseases (ID) worldwide including untold hardship to a number of countries on the African continent. Uganda is a prime example, with its fair share of frequent ID epidemics in the previous decade. Located in the east-central part of the African continent, Uganda is home to approximately 44 million people, with a steady annual growth rate of 3.61% [1]. Uganda's recurring ID outbreaks include previous episodes of Hepatitis E, pneumonic plague, measles, meningitis, and rubella, as well as Ebola Virus Disease (EVD) [2]. EVD's case-fatality rate of approximately 50% [2,3], categorizes it as an ID lethal enough to gain national attention. There is increasing evidence that attributes Uganda's continuous episodes of ID outbreaks to its low life expectancy of 58.5 years in the past 20 years as well as several poor socio-economic and health indices [1].

Despite poor health and socio-economic outcomes, there appears to be solace in Uganda's effort to improve its ID preparedness against future outbreaks. In a recent report, Uganda was categorized as a 'more prepared' country according to the Global Health Security Index (GHSI) report [5].The report rated Uganda as 63rd amongst 196 countries in the world and third on the African continent, after South Africa and Kenya [5]. Uganda's score in the rapid response dimension of the index was 18.1 points higher than the global average; an achievement that can be reflected in how they have promptly responded to EVD outbreaks. Similarly, the World Health Organization (WHO) reported that Uganda's overall Ebola preparedness level had increased from 53% to 84% between 2018 and 2019 [6]. A number of these successes can be attributed to Uganda's rapid response strategies, which include developing national response plans, emergency response operations, risk communications, and travel restrictions [5]. Furthermore, according to the WHO, the key areas where notable improvements in ID control have been made include: emergency coordination, surveillance, case management, safe and dignified burial practices, improved laboratory capacity, risk communication and community engagement, operational logistics, and vaccinations [3,7-9].

Nonetheless, despite Uganda's success in addressing past EVD outbreaks, other IDs—such as cholera, typhoid, and HIV still represent a significant threat to their national public health [10,11]. Studies have demonstrated that applying a fragmented, rather than synergistic, approach in addressing ID outbreaks oftentimes diminishes the efficacy of disease control efforts [18]. For instance, the

National Cholera Task Force (NTF) suffered from weak leadership and poor coordination of interventions to address the drivers of cholera [12,13]. These challenges diminished the impact of their cholera control programs, even though they had adopted the country's successful EVD approach.

This has necessitated the need for a more streamlined, coordinated approach [13]. A key question that stakeholders involved in the Ugandan ID response need to consider is: how can the successes of Uganda's EVD response be effectively replicated to strengthen its national response to diseases still posing a public health threat in Uganda? This paper argues that effective communication, as a key strategy to foster synergy, can improve Uganda's ID preparedness, especially when combined with established strategies from their EVD response approach.

## POLICY RECOMMENDATIONS

Increasing synergistic communication between task forces has the potential to leverage current resources to improve Uganda's ID response. Integrated stakeholder communication will enable the early detection and control of all IDs. The key stakeholders to include during ID outbreaks are the Ugandan ID response teams, the Ugandan Ministry of Health (MoH), and local healthcare workers.

There is compelling evidence to demonstrate that poor communication contributes to: insufficient personnel deployment, poor coordination between healthcare workers during Public Health Emergency of International Concern (PHEIC), and improper implementation of infection control practices within the health system [14]. Similarly, inefficient communication and coordination amongst district authorities, health workers, public health emergency operations centers, and Points of Entry (PoEs) can further complicate Uganda's future ID response [15]. In line with the WHO's building blocks of health systems strategy, without properly established communication channels and governance, future ID outbreaks may develop into uncontrollable PHEICs with far-reaching consequences that can potentially extend beyond national borders [16]. Ario et al. also highlights that the responsible bodies for emergency preparedness are mostly led by international organizations, causing inefficiencies amongst local healthcare providers [17]. Despite successful progress in Uganda's disease surveillance, reporting, investigation, and analysis, Masiira et al. and Nakiire et al. [10,18] identified that opportunities still exist to improve coordination in Uganda's ID approach.

Strengthening communication between affiliated stakeholders during EVD outbreaks was instrumental in increasing Uganda's ID preparedness levels from 53% to 84%, and should be adapted in other ID response scenarios [6]. Therefore, reforms to enhance the capacity of the Ugandan ID stakeholders to take on more prominent roles in ensuring effective communication amongst key stakeholders, will not only improve synergy during PHEICs, but also improve ID response outcomes. This approach has the potential to address Uganda's long-standing problem of responding to other ID outbreaks, as well as improve their national ID preparedness. Stakeholders should also be empowered to coordinate Uganda's ID detection and control activities such as: standardizing ID surveillance, data management and protocols amongst all stakeholders, facilitating communication of possible outbreaks between lower and upper decision-making levels, and ensuring the equitable distribution of personnel and resources to hot spots during ID outbreaks. Nevertheless, stakeholders should not exclude working and learning from foreign organizations who come with valuable experience in ID control. Expectedly,
the implementation of this policy may yield the desired outcomes that the country seeks to achieve in preventing and controlling all future IDs.

## CONCLUSION

In conclusion, based on increasing evidence that demonstrates that Uganda's current ID efforts are obstructed by siloed communication systems, this paper proposes that assigning the key task of improving communication to coordinate stakeholder efforts will foster synergy and improve

Ugandan ID response outcomes for all future outbreaks by leveraging the efficient use of available resources.

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OPINION EDITORIAL

# Proposing a Proactive Risk Communication Approach to Improve Brazil's Infectious Disease Outbreak Preparedness

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## INTRODUCTION

Brazil is the largest country in Latin America, with a population of over 208 million people [1] and with a rapidly growing economy it is set to become a global economic power by 2050 [2]. Brazil's 1988 constitution recognized citizens' rights to universal health coverage (UHC) [3], which resulted in the government implementing innovative strategies to ensure that every citizen had access to healthcare services. Such strategies included increasing the number of primary care facilities which resulted in an increase in the number of primary care consultations per individual [4]. Similarly, the government's commitments to ensure public health security prompted the creation of the National Health System (Sustema Único de Saúde (SUS), which enabled the incorporation of a Digital Health Strategy (e-Health or digiSUS), whose focus was to "expedite care, and improve the flow of information to support decision making in health" [5]. The 2019 Global Health Security Index (GHSI) report places Brazil as the 22nd country in the world and the first amongst the 33 Latin American and Caribbean countries in their infectious disease outbreak preparedness [6]; validating the government's commitment to ensure public health security. Brazil's infectious disease preparedness enabled the country to address several infectious disease outbreaks, including the Zika virus outbreak.

## GAPS IN RISK COMMUNICATION

However, while the Brazilian public health agencies were praised for their proactive response during the 2015 Zika virus outbreak, there is growing evidence that suggests the existence of gaps in the communication of risks associated with public health emergencies [7]. Even though Brazil's approach to developing a social media and mobile communication channel for emergency risk communication (ERC) [8] appears laudable, this strategy does not explicitly address communication methods with frontline healthcare workers. Furthermore, though there are calls for Brazil to incorporate timely press releases into their emergency communication strategies [9], as general apathies towards risk communication still exist during public health emergencies. Brazil's GHSI ranking of zero on the "communications with healthcare workers during a public health emergency" [6] scale also gives credence to the need to review current communication strategies amongst health workers in order to guard against a poor response in the event of an infectious disease outbreak. The gap has the potential to increase the risk of infectious disease transmission and occupational accidents by 20% for Brazilian healthcare workers [10,11], especially during a crisis scenario such as an Ebola virus disease outbreak. Therefore, this paper proposes a proactive risk communication approach as a strategy to improve communication flow from frontline health workers to the different decision-making levels in the event of an infectious disease outbreak.

Effective risk communication is an integral component of any emergency response; it is the real-time exchange of information between experts, community leaders, officials, and the people who are at risk [12]. One benefit of this strategy can be seen during public health emergencies, where effective risk communication allows those who are at greatest risk to understand and adopt protective behaviours [11] in a manner that can significantly reduce morbidity and mortality on a large scale. It also ensures that authorities and experts listen to and address public concerns, especially when it is evidently relevant, trusted, acceptable, and useable [12] to drive an infectious disease response.

## PROPOSED STRATEGY

The proposed risk communication strategy involves the Brazilian government setting up strategic communication hubs at different levels within the country's infectious disease response ladder. These hubs should be active real-time communication networks, established and maintained to manage risk communication amongst frontline health workers, the community, and the key decision-makers in the event of a public health emergency. The communication hub should also take advantage of the strong links between community surveillance systems and primary healthcare clinics to establish a functional communication channel that feeds real-time information to the different decision-making levels in their infectious disease management structure. To ensure ownership and sustainability, the communication hubs should be for the people and managed by the people. In this way, the contributions they make towards providing real-time information is accepted as a valued contribution in the event of an outbreak. The government can also take advantage of technological advancements by integrating risk management and communication within the country's e-Health framework. This approach will accelerate the transmission of information through electronic channels, allowing frontline healthcare workers to act in a quick and efficient manner in the event of a public health emergency. By strengthening the relationship between public healthcare workers and the community, the transmission of information will be more precise [13], productive, and preparatory.

Countries, where these strategies have proven to be effective, include India and Canada. Despite India and Brazil being identified as nations projected to have major economic influence by 2050 [2], India's "communications with healthcare workers during a public health emergency" score of 100 sets it apart from Brazil [3]. India's utilization of a two-way communication strategy between public health officials and healthcare workers during public health emergencies, including engagement of the public and private sectors [14], appears to be a silver bullet in their infectious disease preparedness approach. The approach includes having control rooms at the national and state levels and incorporating satellite hubs that support real-time communications between all emergency services [14]. Canada initially lacked an effective communication strategy as healthcare workers identified deficiencies in "explaining when and why standards of care change during disaster response" [15]. Subsequently, Canada incorporated the Health Notices System (HNS), which mimics the two-way communication system in India [16]. This system has contributed to Canada's 100% GHSI score today.

## CONCLUSION

In summary, Brazil's need to improve its risk communication strategy amongst healthcare workers, especially frontline workers, requires the design of a strategy to address key gaps. These workers should be recognized as a credible source of information [17], whose inputs in the decision-making process can halt the spread of an infectious disease outbreak. Brazil can adopt other countries' methods, such as India and Canada, who have trusted communication strategies that integrate risk communication into their e-Health strategy; this has the potential to improve the flow of communication between public health officials, healthcare workers, and Brazilian communities.

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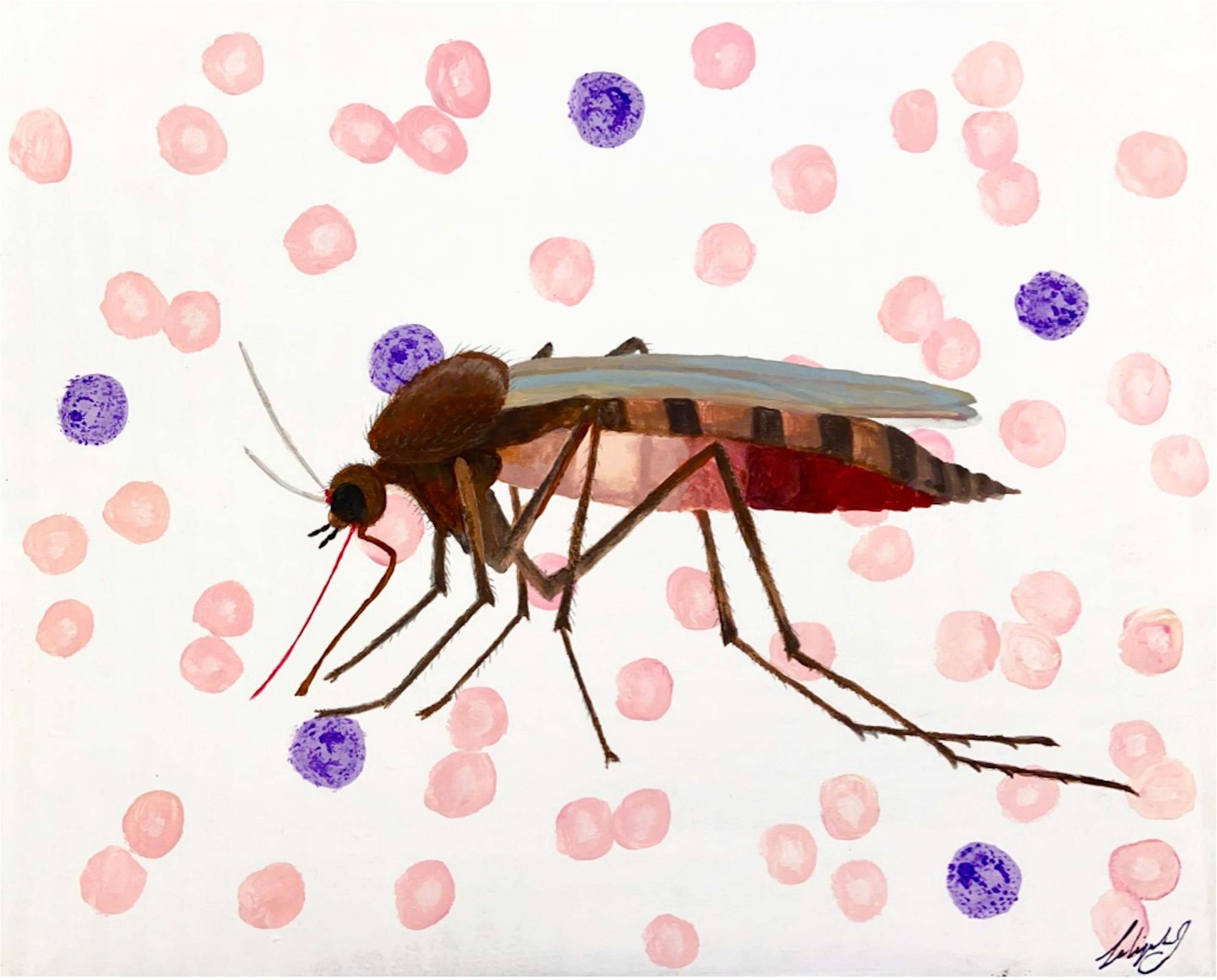

# Anopheles

*Malaria is a severe febrile disease caused by Plasmodium parasites spread through infected female Anopheles mosquitoes. Yearly there are more than 220 million Malaria cases worldwide, with the most vulnerable group being children under 5 years old. The acrylic painting depicts this malaria vector with an extended proboscis and full abdomen, floating on a background of microscopic red blood cells (RBCs). The infected blood cells (in purple) are in the circulatory system with uninfected pink RBCs. Although this illness is preventable and curable, many still lack access to treatment for it.*

*Art by Labiqah Iftikhart*

# Environmental Health

HEALTH-CENTRED PERSPECTIVES ON ENVIRONMENTAL THREATS, WATER AND SANITATION ACCESS, AND IMPLICATIONS OF CLIMATE CHANGE ON HUMAN HEALTH.

Photo Courtesy of Tanya Tewari

OPINION EDITORIAL

# Water and Sanitation in Ghana: A Work in Progress

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## INTRODUCTION

Having made considerable progress towards the Millennium Development Goals and following several peaceful democratic transitions, Ghana is widely regarded as a leading example for other West African nations to follow [1]. According to the 2019 WHO and UNICEF Joint Monitoring Report, approximately 81% of the Ghanaian population had access to at least a basic water service (i.e., an improved water source located within 30 minutes of travel time) in 2017 [2]. However, approximately 6% of the Ghanaian population still relies on surface water to meet their daily water needs, risking exposure to water-borne infections and other associated health complications [2].

From the sanitation perspective, eight in ten Ghanaians lack access to toilets, rising to nine in ten in rural areas [3]. An outcome of exposure to water-borne pathogens is diarrhea. Around 4,000 children die from diarrhea every year in Ghana and it has been estimated that improved sanitation can reduce diarrhea rates by 36% [4]. Therefore, providing better access to clean water and basic sanitation is imperative. Currently, non-governmental organizations such as WaterAid and Safe Water Network work alongside the Ghanaian government and communities to tackle these water issues in both rural and urban areas. In 2018, we visited Accra, Ghana’s capital, to learn more about the country’s progress towards the 2030 targets for Sustainable Development Goal (SDG) 6 (Water & Sanitation). In this piece, we reflect on prominent successes, challenges, and next steps pertaining to Ghana’s advancement towards SDG 6 targets that we learned during our time in the country.

## CHALLENGES

The difficulties in meeting SDG 6 in Ghana are characterized by regional disparities, social and industrial practices, and incomplete or stopgap solutions. Even though Ghana faces challenges related to water accessibility nationwide, there are stark differences between the issues in urban versus rural settings. Infrastructure is regularly overwhelmed during the rainy season, whereas water sources often run dry at other times of the year, particularly in the North. In rural areas, the lack of proper facilities is a key concern. Meanwhile, urban areas have been expanding due to the internal migration. This migration pressure has resulted in landfills that are improperly designed, marginal areas without proper services, and water points that lack potable water. Moreover, to satisfy surging demand, some people are building affordable houses without proper toilets, despite policies that prohibit this [3].

In Ghana, many people still practice routine activities that affect human health and the environment. One clear example is open defecation, practiced by 18% of the population. The problem: in some circumstances there is no practical alternative to open defecation available [2]. Another issue is high levels of pollution, especially from water-intensive industries such as agriculture, and illegal mining practices that lead to heavy metal contamination.

The sustainability of current approaches is another barrier. In the absence of adequate maintenance, sufficient supplies, and appropriate training for the personnel, new facilities alone do not bring about a long-term solution. Lack of focus and commitment to the ongoing projects is another challenge when addressing issues related to WASH. At times, a lack of funding also limits the available actions to maintain and sustain a water facility.

## SUCCESSES

It is important to note that despite these shortcomings, Ghana continues to outperform many of its neighbours on these issues [5]. Furthermore, Ghanaian youth are also heavily invested in ensuring their country's progress towards SDG 6. Ghana's progress towards SDG 6 has been driven by a clear recognition of the importance of improving accessibility to WASH. This progress improves the lives of Ghanaians with spillover benefits such as time costs savings, including time lost from school, as well as reduction in transmission of water-borne infections, which affect both individual health and the nation's overall productivity. Moreover, it is unreasonable to expect a complete transformation to take place overnight; incremental progress is still progress, giving reason for continued optimism.

## NEXT STEPS

For Ghana to meet its 2030 SDG 6 targets, an effective and lasting solution hinges on widespread collaboration, in which everyone pulls their weight and takes collective ownership of the country's water resources, rather than waiting passively for help to be provided. A multidisciplinary and integrated approach is needed to protect and improve Ghana's water sources. Community-led total sanitation (CLTS), an approach that WaterAid and other NGOs are working to implement, seems to have great potential in the country [6]. This strategy is based on respect for pre-existing indigenous social structures by harnessing them to communicate with people in rural communities [6]. It is frequently found to be more effective than approaches that do not involve the community [6].

A recurring critique is that although the government has strong laws and good policies, they fall short regarding their implementation. Sharing of responsibilities through the CLTS approach can help to resolve questions of jurisdiction, while improving coordination between central government and local leaders. Greater engagement with the communities receiving support, and in particular allocating funding towards ongoing maintenance can help communities to sustain their improved facilities. Respect for community structures can also improve enforcement of these policies and limit non-compliance more effectively than instructions from outside the community. Moving forward, NGOs such as WaterAid are prioritizing greater inclusivity and equity in their water systems. Similarly, the Ghanaian Government has introduced guidelines for institutions to ensure inclusive facilities; examples include providing latrine facilities that are required to have an accompanying separate change room for girls to use for menstrual hygiene, complete with a full-length mirror, and making facilities wheelchair-accessible [6]. These are promising policies that must be put into action across the country.

## CONCLUSION

Our experience in Ghana revealed that many of the water-related issues that the country faces are well understood, and that both the government and NGOs are taking promising steps towards addressing these problems. However, there is also an acknowledgement that these efforts cannot ultimately succeed and become sustainable in the long run without greater engagement at the community level that would complement government strategies. Empowering and educating individuals and communities about the key roles that they can play in securing and maintaining safe and universal access to WASH represents Ghana's best hope for achieving the SDG 6 targets outlined by 2030.

## ACKNOWLEDGEMENTS

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RESEARCH ARTICLE

# Risk Factors for Acute Pesticide Poisoning in Developing Countries: A Systematic Review

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## ABSTRACT

Acute pesticide poisoning (APP) is a major public health issue in developing countries. While much country-specific research has been conducted on APP, international epidemiological trends have been difficult to describe. In this systematic review, we summarize individual-level findings from multiple countries. Prominent risk factors identified for both voluntary and involuntary cases include young age, lack of farming experience, low socioeconomic status, lack of education, risky pesticide handling and storage practices, insufficient knowledge of pesticide hazards, and high organophosphate use. In combination with region-specific findings available in the literature, this review contributes to the global understanding of APP as needed for corresponding policy action.

## INTRODUCTION

Acute pesticide poisoning (APP), defined by the World Health Organization as “any illness or health effect resulting from suspected or confirmed exposure to a pesticide within 48 hours”, accounts for significant morbidity and mortality worldwide [1]. It can result from either involuntary (e.g., accidental or occupational) pesticide exposure or voluntary pesticide consumption for purposes of suicide and/or self-harm, with the latter becoming more common in recent years, leading to APP increasingly featuring in global health policy dialogue [1].

While vast cross-country variations exist, studies from developing countries have reported APP incidence rates of as high as 180 per 10,0000 [2], a trend attributed to a myriad of individual and societal factors. While research on individual-level APP risk factors has been conducted, few researchers have taken the step of compiling multi-country data to identify cross-cutting trends, an understanding of which is central to the development of a robust international public health response. This systematic review aims to rectify this gap through a geographically broad analysis of the available literature on the risk factors for APP amongst agricultural workers and their families, those most commonly exposed to pesticides, in developing countries, as classified in the United Nations’ most recent 2019 World Economic Situation and Prospects report [3].

## METHODOLOGY

To identify studies for inclusion in this review, systematic searches were conducted in three databases: Web of Science (BIOSIS Previews), GeoBase (Engineering Village), and OVID (Embase, Medline, and PsycINFO). Specific search strategies comprising keywords and, where necessary, corresponding subject headings were developed for each database. Articles were successively screened by title, abstract, and full-text. Eligible articles: a) had a study population consisting of agricultural workers and/or their families, and b) reported either quantitative or qualitative associations between individual-level variables and incidence or prevalence of APP. The search identified 1628 potentially eligible articles. Of these, the full-text of 37 were reviewed, and 15 studies were included in this review (see Figure 1). Studies selected for inclusion were rated for risk of bias (ROB) using the Risk of Bias in Non-Randomized Studies (ROBINS-1) assessment tool. Data was extracted using a pre-constructed data collection chart, and findings pertaining to demographic and work-related risk factors were analyzed by way of comparison and synthesis of results across studies.

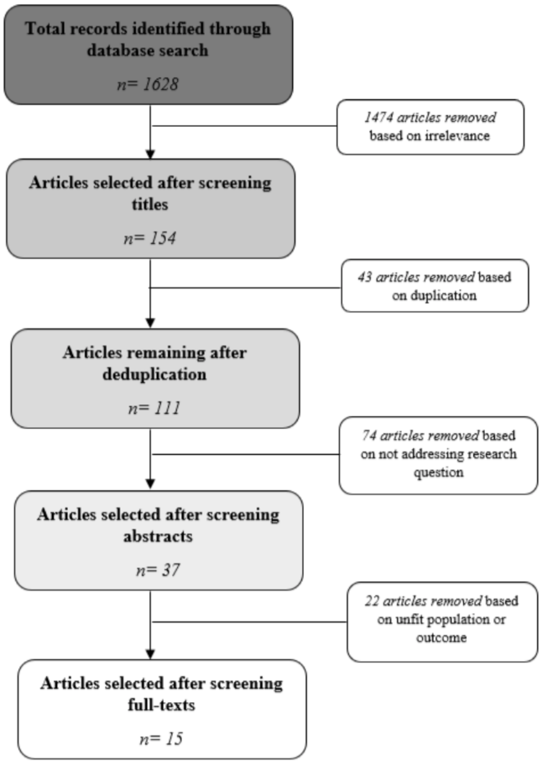


**Figure 1.** Article Screening Flowchart.

## RESULTS

Of the 15 studies, eight [4-18] included only involuntary cases of APP, three [12-14] included only voluntary cases, and four [16-18] included both voluntary and involuntary cases. While most studies (n= 74,6-9,15,17) employed a cross-sectional study design, two studies [13,16] were retrospective case series', three [10,11,14] were case-controls, one [12] included both a cross-sectional analysis and a retrospective case series, one [5] was a prospective cohort study, and one [18] was a prospective case series. The studies spanned a total of 13 different countries: Iran [4], India [5,12], Jamaica [6], Ethiopia [7], Malaysia [8,17], Uganda [9], Brazil [10], Morocco [4], Sri Lanka [14,16,17], Indonesia [11,17], Thailand [17], Nicaragua [15], and Nepal [18].

The ROBINS-1 ROB assessment tool identified one study [10] at low risk, three [4,5,18] at moderate risk, eight [6-9,11,14,15,17] at serious risk, and three [12,13,16] at critical risk of bias.

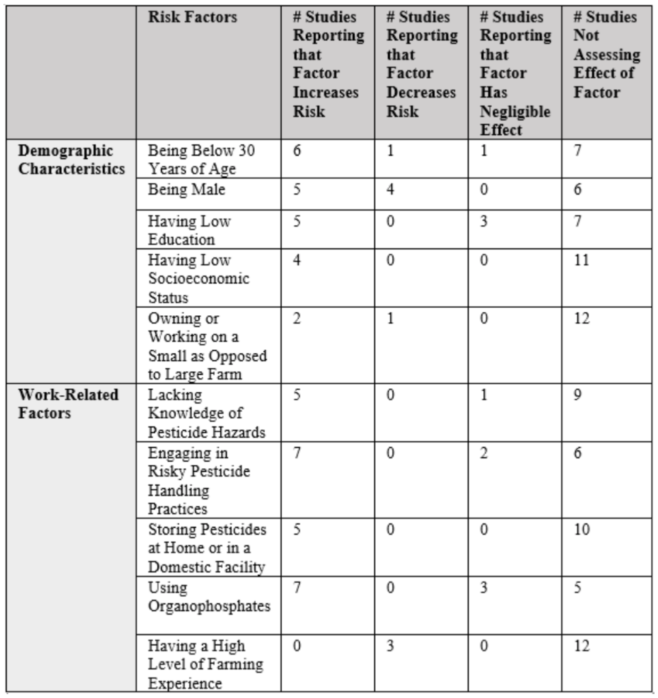
The distribution of studies reporting demographic and work-related risk factors is summarized in Table 1. Individuals below the age of 30 had an increased risk of APP in six of the eight studies that assessed its effect, suggesting that age is a potential risk factor. Additionally, low socioeconomic status (SES) was associated with APP in all four of the studies that assessed its impact. Other demographic variables such as sex, educational status, and farm size appear only weakly correlated with APP incidence.

With regards to work-related factors, the following characteristics increase risk of APP: lacking knowledge of pesticide hazards (e.g., due to lack of training or inability to read pesticide hazard labels), engaging in risky pesticide handling practices (e.g., not using personal protective equipment (PPE), using a leaking sprayer), storing pesticides at home or in a domestic facility, and using organophosphates extensively.

## DISCUSSION

The findings of this review, summarized in Table 1, reveal a myriad of factors that have the potential to influence the vulnerability of agricultural workers to both voluntary and involuntary APP. Yet, most interesting are the ways in which the identified risk factors can be causally linked to APP through multiple plausible pathways. For example, young age may correspond to a lack of farming experience, which could render one less adept to safe pesticide handling and storage practices and less aware of pesticide hazards. This notion is further supported by the protective effect of a high level of farming experience, as indicated in Table 1. Due to the relationship between age and impulsivity [19], young age could also increase the likelihood of acting upon thoughts of suicide in times of adversity. Most notably, low SES (defined by caste, income level, or unemployment in the reporting studies listed in Table 1) may hold relationships with other risk factors. Due to its association with lower levels of education and literacy, low SES may reduce one's capacity to read or understand pesticide hazard labels, particularly when highly technical terminology is used. Furthermore, the financial barriers associated with low SES would presumably reduce one's ability to access PPE and high-quality (i.e., leak-proof) spraying equipment. Financial pressures may also increase the daily hardships experienced by rural farmers, thus increasing their likelihood of ingesting pesticides for purposes of mental distress alleviation.

**Table 1.** Summary of Findings on Demographic and Work-Related Risk Factors for Acute Pesticide Poisoning from Reviewed Studies (n= 15).



| | Risk Factors | # Studies Reporting that Factor Increases Risk | # Studies Reporting that Factor Decreases Risk | # Studies Reporting that Factor Has Negligible Effect | # Studies Not Assessing Effect of Factor |
|---|---|---|---|---|---|
| **Demographic Characteristics** | Being Below 30 Years of Age | 6 | 1 | 1 | 7 |
| | Being Male | 5 | 4 | 0 | 6 |
| | Having Low Education | 5 | 0 | 3 | 7 |
| | Having Low Socioeconomic Status | 4 | 0 | 0 | 11 |
| | Owning or Working on a Small as Opposed to Large Farm | 2 | 1 | 0 | 12 |
| **Work-Related Factors** | Lacking Knowledge of Pesticide Hazards | 5 | 0 | 1 | 9 |
| | Engaging in Risky Pesticide Handling Practices | 7 | 0 | 2 | 6 |
| | Storing Pesticides at Home or in a Domestic Facility | 5 | 0 | 0 | 10 |
| | Using Organophosphates | 7 | 0 | 3 | 5 |
| | Having a High Level of Farming Experience | 0 | 3 | 0 | 12 |

Given the multifaceted role that poverty appears to play in shaping one's APP risk profile, new programs should primarily support poor and marginalized agricultural workers to overcome the constraints impeding them from upholding safe occupational practice standards, as well as those rendering them vulnerable to such things as suicidal ideation. Potential initiatives could include community agriculture programs involving the distribution of subsidized PPE, the provision of comprehensive pesticide application training and other social supports to financially vulnerable farmers, policies that promote greater clarity of hazard information on pesticide labels (e.g., policies that mandate its depiction in both textual and pictorial—universally comprehensible—formats), and efforts to standardize global regulations on pesticide use such that highly toxic compounds subject to bans in industrialized nations are similarly discontinued in developing countries [20-22].

Before drawing broader conclusions from these results, it is important to acknowledge their limitations given the methodological weaknesses (e.g., ill-defined APP diagnostic criteria, use of retrospective/cross-sectional data, subjectively measured exposure variables) and resulting high risk of bias of many of the included studies. Still, this review makes an important contribution to the existing literature on APP, and when combined with future, more robust research on the topic, this will help establish a powerful knowledge base for informing policy-level action.

## CONCLUSION

Overall, the findings presented in this study provide a global view of APP and its interconnected social determinants, generating the conclusion that APP risk is deeply interconnected with one's unique social profile and economic standing. By compiling cross-country data from [13] different countries, the results exhibit extensive geographic scope, an important departure from country-specific studies. The identified risk factors, namely age, gender, education level, and work-related factors, can be used to inform the direction of future studies that strengthen the corresponding evidence base. Such knowledge can, in turn, inform both national and international decision-making processes, with the aim of addressing the APP epidemic and its widespread global health implications.

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OPINION EDITORIAL

# Climate Change and the Role of the Frontline Physician

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## INTRODUCTION

With the growing awareness of its significance and multisectoral implications, it is necessary to understand climate change as a direct and pressing health issue [1]. Climate change has resulted in an average increase in global temperature, more extreme weather events, a rise in sea levels, and is also intimately associated with worsening air quality and a change in disease distribution [1]. Although low-and middle-income countries have relatively lower greenhouse gas emissions per capita than their high-income counterparts, it is expected that they will experience the brunt of these effects in the years to come [1]. In fact, adverse climate-related health outcomes are likely to be a reality for a significant portion of the global population. This Opinion Editorial will assert that frontline primary care providers and emergency medicine physicians are thus uniquely positioned to have a role in addressing adverse health outcomes expected to occur from climate change.

## THE IMPACT OF CLIMATE CHANGE ON HEALTH

Perhaps the most easily identifiable health effects of climate change are the primary effects, also referred to as direct effects [2,3]. These include heat-related illnesses, like heat exhaustion and heat stroke, as well as injuries and mortality due to storms and floods [2,3]. However, readily observed primary effects fail to capture the full picture, as illustrated by the death count from Hurricane Maria in 2017. While the official death count from the hurricane's landfall was 64, an estimate that accounted for the aftereffects of the storm placed the death toll at 4,645 [4].

Secondary or indirect effects have a non-linear relationship with health, yet comprise the bulk of the climate-health relationship. This can make them more difficult to quantify, predict, and study. Secondary effects refer to shocks within social and economic systems and to infrastructure. Food supplies are a prime example of this, as they are particularly vulnerable to changes in climate. In 2010, Russian wildfires destroyed one third of wheat supplies, increasing prices and halting international export [3]. Food shortages and resultant price fluctuations likely played a key role in the resultant increase in population wide malnutrition and food insecurity, with well-known negative health consequences [2,3,5]. Rising temperatures can also lead to water shortages, as seen in Cape Town in 2018 [2,6]; the water stress there caused dehydration, reduced the frequency and efficiency of hygiene practices, and increased vector-borne disease transmission [7]. The downstream effects of floods can also lead to the contamination of groundwater supply and increase diarrheal illness, as seen in a norovirus outbreak following Hurricane Katrina [3,6]. A final example of secondary impacts to health include the compromise to healthcare access which can occur when hospitals are damaged by fires, requiring patient relocation [8,9], and limiting the distribution of necessary medications [4].

Moreover, when the climate changes, geographical patterns of disease can quickly shift as well. Warmer weather has extended the range of tick-borne diseases northward: the at-risk areas for

Lyme disease in Canada and tick-borne encephalitis in Sweden have expanded with tick habitats [2,3,6]. Similarly, malaria, dengue, and cholera are of growing concern in areas where mosquitoes are now able to proliferate [2,6]. Additionally, with changes in the landscape of livable spaces, increasing urbanization pressures are also leading to an increase in the encroachment of human populations onto wildlife territories. For example, a 2018 study described an increased burden of animal-related injuries, including bites and stings, which was thought to be attributable to this overlap between human development and available habitat for wild animals [12].

Tertiary effects of climate change on health largely relate to the socioeconomic fallout from the primary and secondary effects. Although extremely significant, these effects are poorly documented because of difficulties with quantification. For example, the economic impact of job loss in Canadian communities that rely on forestry, fishing, and farming will contribute to malnutrition and housing insecurity [2]. Conflict over clean water and living space, as well as trauma from significant disasters, will likely only exacerbate these challenges [2,3].

Of particular concern is that disadvantaged and vulnerable populations will feel these effects most acutely: the very young and very elderly, people with unstable housing or living in substandard housing conditions, and the chronically ill [3,13]. Difficulty accessing transportation and affording food, inappropriate home temperature regulation in the summer and winter months, and increased social isolation will exacerbate climate-health interactions in these populations [5].

## WHAT CAN PHYSICIANS DO?

Once the various health impacts of climate change are understood, healthcare providers must take steps to mitigate them. Family and emergency medicine physicians in particular are well-poised to assess climate-health impacts and therefore engage in patient education on this matter, while advocating for needed change.

### *I. Patient Education*

By educating their patients and promoting behavioural change, family physicians can simultaneously help patients adapt to climate change and mitigate environmental damage. In particular, by encouraging active transportation such as walking, running, or biking, physicians can reduce carbon emissions while improving the cardiovascular health of their patients [3]. Encouraging patients to replace meat with foods further down the food chain, such as plant-based alternatives is another strategy to reduce the environmental impact of animal agriculture as well as rates of cardiovascular disease, obesity, and diabetes [3].

### *II. System-Wide Action*

There are many ways to effect change at a systems level as a frontline physician. In particular, physicians can identify wasteful practices in their workplace and either employ more sustainable alternatives themselves or advocate action from hospital administrators and management. Eliminating or reducing waste in the healthcare sector—accounting for 10% of emissions in the US—is not only important, but attainable; Gundersen Health Systems is one such example of an organization that generates more energy through solar, wind, and methane than it consumes [8]. By advocating to elected officials, physicians can help encourage the adoption of similar initiatives in other settings, by testifying publicly or meeting with legislators. Connecting with advocacy organizations and climate activism leaders is an important strategy in streamlining efforts, and ensuring physicians' efforts are most optimally directed [3,8]. Likewise, physicians could partner with public health colleagues to engage more deeply in the organization of emergency response facilities to accommodate increased patient volumes following heat waves and floods [3].

### *III. Individual Action*

At an individual level, there are many opportunities for family physicians to contribute to change through personal lifestyle changes. By participating in eco-friendly behaviours like active transport, they can reduce their own carbon footprint while serving as positive role models [3]. By implementing sustainable practices in their offices (e.g. less printing, reusable cloth gowns, lights on timers, showers and bike storage for employees and colleagues), physicians can normalize positive behaviours for medical trainees to carry forward into their own practice [13].

### *IV. Collective Action*

Collectively, physician associations should become more aware of what resources they invest in. By financially divesting from the fossil fuel industry and allocating investments toward environmentally-responsible organizations, physicians can apply significant financial pressure to promote positive change [8]. In addition, the purchasing power of physicians may allow them to influence medical supply companies to adopt more environmentally friendly options, by preferentially supporting businesses which shift to more responsible practices [15]. Common disposable supplies—gowns, drapes, basins, and so on—can be made to be reusable, saving money in the long term and substantially reducing medical waste [16]. Similarly, family physicians can use their voice to encourage financial divestment at the level of large-scale professional organizations, such as medical schools and hospital networks [8].

## CONCLUSION

As climate change and its consequences accelerate, adverse health outcomes will become more prevalent across the globe. Family and emergency physicians will be the first contact for many patients whose health will be affected by disease, poor air quality, extreme weather conditions, and food insecurity. Therefore, physicians must play a role in climate change advocacy, from single-patient interactions to major systems-wide change, in order to ensure the health of both their patients and their communities.

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# Is it Safe to Drink?

*For billions of people across the globe the answer is "no". As of 2019, the WHO reported 1 in 3 people globally do not have access to clean drinking water. While there are numerous factors that contribute to this, the art displays some of the major sources and contaminants of water pollution, such as improper wastewater disposal and agricultural pollution.*

*Art by Ruijia Zhang*

# Health Equity and Access

A LOOK AT DISCOURSE AND STRATEGIES TO IMPROVE EQUITABLE ACCESS TO HEALTH CARE OF VULNERABLE POPULATIONS.

Photo Courtesy of Tanya Tewari

OPINION EDITORIAL

# Political Uprisings and Global Health: The Case of the Arab Spring and Uprisings in India

**Suhail Hashim,** Loma Linda University

In recent years, there has been a surge of political uprisings around the globe, with residents of many countries demanding basic human rights, better governance, and social justice. Political uprisings influence health systems of a country and specifically the mental health of its citizens. This Opinion Editorial will deconstruct health concerns associated with the political uprising of the decade old Arab Spring, and recent uprisings in India.

## THE ARAB SPRING: MENTAL HEALTH AND ACHIEVING HEALTH EQUITY

One of the major revolts the world saw in the last decade was the Arab Spring. The pro-democratic movement which spread across the Arab world in the Middle East and North Africa maintains significance today. The primary goal of the revolution was to bring down authoritarian governments in countries such as Tunisia, Syria, Libya, Egypt, and Bahrain. In a broader sense, a public opinion poll conducted in this Arab Region by Zogby Research Services before 2011 showed that access to quality health care as one of the top priorities [1]. Interestingly, the attitude of people towards mental health in Arab countries like Tunisia and scarcity of mental health facilities also played a part [2]. For instance, Tarek el Tayeb Mohamed Bouazizi set himself on fire in front of the governor's office in the city of Sidi Bouzid, to protest against the poor governance of the city officials. This incident planted the seeds for Arab Spring, and it was later reportedly that he suffered from poor mental and emotional health due to the humiliation faced as a result of treatment of people from low socio-economic status in Tunisia [3].

Even though the United Nations Development Program (UNDP) recognized health as the basic human right in the year 1994 [4], it was not until 2009, hardly a year before the Arab Spring that the Arab Human Development Report (AHDR) reinforced this concept by devoting its entire Chapter 7 to "[a]pproaching health through human security – a road not taken". Dr. Enis Boris, Health Sector Manager for the Human Development Department for the Middle East and North Africa at the World Bank argues: people were well aware of the health inequity in the health systems of this part of the Arab world, and they intended to reform this with the Arab Spring [5]. Nonetheless countries like Egypt, which was one of the major countries that came to fore during the revolution, had been showing significant improvements in its health indicators. From 1990 to 2013 there was a 62.5% decrease in Egypt's maternal mortality rates, and the incidence of tuberculosis, a prevalent communicable disease also reduced 37.5% from the period of 2002 to 2015 [6]. But looking at the bigger picture, a survey conducted by National Health Account (NHA) study in the year 2010, showed Egyptians faced disparities when it came to spending for health services. Specifically, high-income populations were found to use health services at twice the rate of the lower income populace [7]. In response, academics like Dr. Hoda Rasha, Director for Cairo's American University Social Research Center and member of the World Health Organization's Commission on the Social Determinants of Health, called for the transformation of health care system in Egypt from a welfare or charity-based approach to a rights-based model. The rights-based model places its thrust on health equity. Dr. Rasha saw hopes in the revolution in Egypt as means for democratization and freedom that can transform the health system to include the marginalized and the vulnerable section of the population [8]. However, the series of political changes in Egypt from the onset of Arab Spring in 2011, to a military government taking over in the year 2014, put a heavy toll on Egypt and its health system. According to the World Bank, Egypt's healthcare spending declined 16.38% from 2015 to 2016 [9]. The low investment in health has been compensated by an increased reliance on the private sector [10]. This has resulted in compromise of quality and safety, as well as concerns around equity of access to services. Sadly, despite the call for reforms, the challenge of achieving health equity in Egypt still needs attention.

## THE POLITICS OF HEALTH IN THE UPRISINGS AND KASHMIR BLACK OUT IN INDIA

In India, the discriminatory Citizen Amendment Act (CAA), 2019 was enacted by the ruling government on January 10, 2020. The CAA offers citizenship to persecuted communities of three neighbouring countries (Afghanistan, Pakistan and Bangladesh) on the basis of religion. It excludes the majority Muslim community of these three countries. The CAA was announced in tandem with implementation of the National Registry of Citizens (NRC); a registry containing details of citizens of India. Critics see this as an attempt to filter and persecute the minorities in India, starting with Muslims, similar to Hitler's Genocide of Jews in Nazi Germany [11]. This fear propagated by the ruling government in India led to widespread protests and uprising in various parts of the country. According to the National Human Rights Commission (NHRC), there are reports of mental health traumas, suicides, and adverse health effects seen in people of India's North Eastern State of Assam where this was first implemented [12].

The suspension of internet and telecommunication services in the Northern part of Indian state of Kashmir shows how health systems can be affected by a government's move to suppress voices of dissent. After the Lancet published an editorial stating that "[t]he militant presence raises serious concerns for the health, safety, and freedoms of the Kashmiri people" [13], the Indian Medical Association (IMA) released harsh criticism for it meddling into internal political affairs. The blocking of internet and other forms of communication in Kashmir happened on August 5, 2019 after the Indian Government undemocratically revoked a special status granted to Indian occupied Kashmir (Article 370 and 35A). The political leaders of state were imprisoned and the state of Jammu and Kashmir came directly under the central governments rule. The government-imposed sanctions affected people's health and ruthlessly compromised the health system of the state. This is happening in a place where access to mental health is already in anguish. The Srinagar-based Institute of Mental Health and Neurosciences (IMHANS) reports only 6.4% of people with a mental illness had seen a psychiatrist, and only 12.6% sought any kind of healthcare help at all [14]. A 2015 study conducted by Doctors Without Borders also mentions nearly one in five people in Kashmir show symptoms of post-traumatic stress disorder [15].

## GLOBAL HEALTH IN POLITICAL UPRISINGS: CALL FOR ACTION

Global health and political uprisings cannot be seen in isolation. The remnants of Arab Spring are still present in countries like Syria and Yemen; whose economies and health care systems are completely broken. The uprising in India and the black out in Kashmir is also ongoing, and in this time, there is a desperate need for mental health access and health equity. As such, it is high time for the global health community to conduct research, push for policy changes, and call for further action to address this pressing global health challenge.

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RESEARCH ARTICLE

# The Effectiveness of Psychosocial Services Offered at a Residential Care Home in the Philippines in Preparing Residents for Life After Care

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## ABSTRACT

Leaving home is a major milestone in every young adult's life, often a time of excitement and some apprehension. However, for individuals who grow up in residential care, this is a time of significant change as they are thrusted into what the literature describes as 'instant adulthood'. Research indicates that young people who leave residential care services, or "care-leavers", experience higher levels of unemployment, poverty, homelessness, and poor health compared to young people who leave familial homes. The majority of the literature that exists on the experience of care-leavers comes from high-income countries where kinship placements and foster care are more common than residential homes. Many developing countries, on the other hand, depend on residential homes to care for high numbers of orphaned or abandoned children. Little is known, however, about the services that are offered at these homes, especially from the perspective of residents themselves. This study aimed to qualitatively explore and evaluate the psychosocial services offered at a children's care home in the Philippines and their role in preparing residents for life after care. Semi-structured interviews were used to investigate the experiences and opinions of care-leavers and staff members. Data was analyzed using thematic framework analysis using NVIVO 11. Overall, participants viewed the support they received as effective in preparing them for life after care, although they did face challenges including economic instability, lack of belonging, and challenges adapting to the 'outside world. Several recommendations were suggested by participants to better support future care-leavers, including provision of counselling services and extended stays to allow for completion of mandatory schooling. More research is needed to strengthen the evidence base in order to champion policy and regulatory change.

## INTRODUCTION

There are approximately 2.7 million children living in institutional care globally [1]. Research indicates that children who grow up in residential care (institutional care provided in a non-family-based group setting), experience higher levels of unemployment, poverty, homelessness, and poor health when compared to young people who grew up in familial homes [2]. In the Philippines, residential care is the primary response for orphans when kinship placements are not possible. Due in part to high poverty (over 20% nationally), kinship placements are often not an option [3]. The exact number of children in care is unknown, as there is no central record-keeping of care-providers. These children are generally under the care of some 197 privately-operated homes across the Philippines, which are residential homes operated by licensed, non-state providers, making it difficult to assess the

the needs of this population and regulate service standards [4]. Services that develop life skills, build resilience, and support community integration are endorsed by the international community for promoting well-being and better outcomes for the young people who leave residential care services, or "care-leavers" [5,6]. However, little is known about residents' own feelings towards these services, potentially leading to suboptimal or poorly targeted interventions that fail to address the full range of challenges they face. The aim of this research was to explore and evaluate the psychosocial support and services offered at a care home in the Philippines for preparing residents for their transition out, in an effort to identify potential opportunities for improvement.

## METHODOLOGY

A qualitative study was used to explore the perceived effectiveness of psychosocial supports offered at a residential care home in Subic Bay, Philippines, in preparing residents for life after care. This study, conducted in June 2018, utilized semi-structured interviews (n= 10) and thematic framework analysis to understand the perceptions of care-leavers (n= 7) and staff (n= 3) of the aging out process and the difficulties faced by youth upon leaving residential care, an appropriate design for an exploratory study focusing on understanding the 'lived experience' of the participants [7]. Ethics approval was obtained from the University of Leeds prior to commencing the research. Each interview was conducted, transcribed, and anonymized by the lead researcher. Data was analyzed with NVIVO 11 using a thematic analysis process [7]. Codes were generated inductively, generating a framework matrix of emerging themes which was used to index subsequent interviews. No data was excluded.

## RESULTS

The ten interviews highlighted that transitioning out of care was "*really different*" and "*emotional*" for for care-leavers, with the main challenges being:

**Economic:** Financial difficulties were the most discussed challenges. Some struggled with budgeting; one told us, "*sometimes I don't eat because... I spend my money not [on] food, sometimes so many expenses in school.*" Others described needing to support their families. Staff supported these points expressing that care-leavers often wished they could return to the home due to financial challenges.

**Belonging:** Care-leavers described a lack of belonging and challenges fitting into life outside the residential home. One participant expressed difficulty living somewhere where "*nobody loves you*", while another felt jealous of peers who had families that could attend events at school.

**Increased Responsibility:** All past residents expressed difficulties balancing work, studies, budget, cooking, etc. Staff framed this increase in responsibility as "*facing reality*" and "*entering the real world*".

**Shock:** Staff observed the home as a sheltered community. "*They live with the other kids, the houseparent's, they go to school [together], they go to a church [together]... so it's like one world that they have*", one staffer explained. Consequently, once residents leave, they are exposed to people with differing beliefs, values, and circumstances. One past resident described feeling alarmed when people used curse words, partied, and drank alcohol. Another staff member expressed concern for those transitioning out of care because they had experienced people "*being swayed*" to participate in those kinds of activities and "*going wild*".

**Independence:** Freedom was considered by all as the best part of leaving care. One care-leaver saw their new independence as a chance to grow and stand on their own. Another stated, "*I want freedom, I can go wherever I want... I can do what I want*". One staff member explained that children may want to be free because the house rules are not imposed by their 'real' parents/family and therefore might see them as restrictive or unfair.

**Effectiveness:** All past residents felt that the support they received from the home was effective in preparing them for life after care, while staff viewed effectiveness as dependent on the individual. One told us, "*those who've experienced living with their own families, when they come to [the home] at… 10, 12 years-old they actually know what it's like so it's not as difficult for them, they appreciate more the things you do for them. As opposed to those who come at… 4 or 5 they feel like they're enclosed in this community.*" Staff also associated a resident's relationship to their family and God as important factors for effective aging out.

## RECOMMENDATIONS

Participants were asked for recommendations for strengthening current services. Recommendations included lengthening the stay at the home until residents completed school, increasing availability of health check-ups, and setting up bank accounts for residents. Two participants spoke about the need for more counselling and psychological services. One said, "*my suggestion [is] counselling, they need that to know [how to] express their feelings. Not all of us likes to express our feelings*." A staff member also expressed a need for access to professional psychological advice, especially when dealing with children from troubled backgrounds or difficult behaviour.

## DISCUSSION AND CONCLUSION

The purpose of this research was to explore and evaluate the psychosocial services offered at a Filipino care home for preparing residents for life after care in an effort to identify areas of improvement.

This study identified the main challenges faced by care-leavers as economic insecurity, lack of belonging, increased responsibility, and adapting to the 'outside world', echoing findings from other studies [2,8,9]. Such difficulties are also experienced by those leaving parental care; however, residential care-leavers often face these challenges alone upon turning 18 and aging out [10]. This study indicated that despite facing various challenges, care-leavers regarded the support they received while in care as effective in preparing them for independent life, even in some cases encouraging a sense of excitement for the opportunity to be independent. The strong community cultivated by the residential home allowed residents to stay connected even after they turned 18. Indeed, many previous residents worked at the home or continued attending the in-house church. It is likely that continued involvement in the home is an important component of care-leaver's social support system and may mediate the challenges associated with the transition to independent life.

This study brings attention to the needs of an oft-overlooked population, adding to the growing body of literature documenting the experiences of residential care leavers in the Philippines and beyond [2,9-11]. It was initiated with the intention of informing service expansion at the host organization, but whose findings and recommendations could be used to spark reflection and action at similar homes nationally. One such recommendation was to provide consistent access to psychological support or professional counselling to help address feelings of isolation and stress experienced by care-leavers, aligning with international advocacy for greater emotional support for children in alternative care [6].

This study had several limitations. As this research focused on just one home, the generalizability of findings and recommendations is limited. Additionally, participant selection relied on a staff gatekeeper within the residential home, potentially producing sampling bias. Therefore further research should focus on sampling from a larger, more diverse population to ensure greater representation and provide better insights into the needs of care-leavers.

This research on a traditionally unrecognized group about their experiences in residential services can help future generations of care-leavers through the identification of the strengths and weaknesses of services in a residential care home in the Philippines.

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OPINION EDITORIAL

# Equal Access to Beneficial Microbes: A Tool for Reduced Malnutrition

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Microbes are intrinsic to human health. Communities of microorganisms within the gut, termed the gut microbiome, have been linked to healthy infantile development, reduced incidence of stunting, reduced incidence of infectious dysentery, and improved weight gain [1-4]. Despite proven benefits, healthy microorganisms are still considered a luxury in low-and middle-income countries (LMICs) [1]. Here, we review importance of the healthy microbes and methods that can promote its accessibility in low-and middle-income countries and help achieve the UN Sustainable Development Goals. With greater exposure to malnutrition and infectious disease, but limited buying power, access to diverse microbes in LMICs proves to be especially beneficial [1].

With recent innovation in the field of microbiology, microorganisms are being cast in a different light to better understand disease and nutrition. Microbes are involved in the development and functioning of the gastrointestinal, immune, endocrine, and metabolic systems [5]. As an integral component of the gastrointestinal system, the microbiome serves to induce vitamin absorption, improve digestion, and remove toxins and pathogenic microorganisms [5]. For optimal health, the microbiome must have sufficient diversity to provide an array of health benefits.

Probiotics, defined by the World Health Organization as "live microorganisms which when administered in adequate amounts confer a health benefit on the host," can be used to restore gut microbial diversity [6]. Infants of low birth weight experienced improved weight gain after probiotic treatment, and similar weight gain improvements have been observed in other groups [4]. Thus, the heavily disrupted gut microbiome in individuals with malnutrition can be counteracted by probiotic intake [2]. With such essential roles in human health, Ishaq et al. suggested that humans should have a right to the access and use of healthy microbes [7]. This right is analogous to the right of humans to access environmental resources necessary for life, and would reduce "microbial inequality" [7]. However, manufactured probiotics remain a luxury that can only be afforded by a select few, and cost remains a barrier for equal access to beneficial microbes [1].

Alternatively, the process of fermentation, a food preparation method that involves organic decomposition by microbes, is an accessible process for all [8]. Fermentation can cultivate microorganisms with probiotic-like effects that can be found in a variety of foods including milk, cereals, and fruits [1]. While fermented foods have been consumed around the world for thousands of years, their microbial benefits have only been discovered recently [8]. The lactic acid bacteria strain that exists in many fermented foods meet and exceed regulatory microbial standards to confer the same benefits as found in probiotics [3]. A study by Alou et al. reviewed several metagenomics studies that identified a depletion of gut microbes in individuals with severe malnutrition [9]. Another study, by Smith et al., indicated that improving the microbiota by fecal transplant or probiotics could replace missing strains in Malawian twin pairs [10]. Gastrointestinal disease and malnutrition are morbidities dominating child mortality worldwide and may be alleviated through microbe supplementation. Fermentation provides a low-cost option to address the causal relationship between the gut microbiome and malnutrition. Thus, fermented foods can potentially be a solution to the nutrition crisis in LMICs.

Fermented foods are consumed globally, with at least some fermented foods being consumed by nearly every culture, but their health benefits are rarely promoted [8,11]. Thus, another method to improve access to beneficial microbes is through health policy and focus on health literacy. In Canada and the United States, food guides recommend yogurt and kefir as dairy products but do not provide further information about their benefits as fermented foods [8]. In Japan, fermented foods are only encouraged for “specified health uses” [8]. As of 2014, India was the only country to include fermented foods as a category in the national food guide, beginning in 2010 [8]. In India, children fed probiotic supplements experienced lower incidence of diarrhea and improve weight and height development compared to counterparts not receiving the supplement [12]. Further, stunting in India has decreased by 4% since 2015 [13]. With the exception of India, fermented foods are rarely promoted as a part of health literacy strategies such as food guides and recommendations. Inclusion of fermented foods or probiotics, where applicable, in health policy and food recommendations would encourage communities to consume traditional fermented foods with an increased understanding of their benefits. Further, inclusion of health-associated microbes in national health policy presents an opportunity to promote beneficial microbes that address health challenges specific to the location. Different gut microbiota compositions in different locations demonstrate the need for specific microbes tailored to these nations [1].

Improving the accessibility of healthy microbes is limited in LMICs, but locally sourced probiotics remain an exception. Today, many fermented foods are made using a starter culture to ensure reliability and reproducibility of microbes present in the food [8]. In 2004, Western Heads East (WHE) – a program established by staff, faculty, and students at Western University Ontario – collaborated with the Tukwamuane Women's Group to establish Africa’s first probiotic yogurt called Fiti, which means ‘Health’ in Kiswahili. Local women from Mwanza, Tanzania were then taught how to produce yogurt supplemented with probiotic Lactobacillus rhamnosus GR-1 and how to start their own community kitchens. Through funding by the International Development Research Center (IDRC), the freeze-dried bacteria was made available in sachets improving the accessibility of the probiotics and allowing the program to grow to over 200 yogurt kitchens in Tanzania, Kenya, and Uganda. The Fiti Probiotic Initiative addresses the social inequality that propagates malnutrition by providing low-cost probiotics to LMICs, training women to make probiotic yogurt, and promoting community health. Such organizations that connect LMICs with the resources necessary to propagate microbe accessibility provide the social infrastructure necessary for improved accessibility to microbes, and the foundation for the inclusion of microbes in health policy.

The study of the microbiota presents an opportunity for immediate action to catalyze change to address the UN Sustainable Development goals of zero hunger, economic growth and industry, sustainable communities, and reduced inequalities [14]. To increase access to healthy microbes would also parallel the World Health Organization global target goals of reduced incidence of stunting, low birth weight, and wasting by 2025 [15]. To reduce social inequality, microbial inequality must first be reduced. International policy and social programming must recognize microbial availability as a right as important as access to healthcare or nutritious foods. To have access to microbes is to reduce the global burden of malnutrition; internationally, the world must understand microorganisms as such.

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OPINION EDITORIAL

# Dire Need for Mental Health Education and Awareness in Uganda

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## THE PROBLEM

Mental health is widely neglected across the globe, and particularly so in low-income countries where funding and resourcing is scarce. In Uganda's culture, mental health is often overlooked due to spread of false information, and lack of education about mental health and the different types of disorders. The stigmatization of mental health is a barrier for individuals who are suffering to access the proper medical attention and social support needed from their community, family, and friends.

Uganda contributes less than 1% of its healthcare budget to mental healthcare, compared with countries such as the UK that contribute upwards of 10% [1]. Mental illness affects over one-third of the population in Uganda and less than half of those individuals seek treatment [2]. There is a lack of mental health personnel, services and treatments including psychiatrists, psychosocial interventions, psychotropic drugs, and psychotherapies [2], and overall the system is unable to meet current and growing demands for care [1]. There is an intricate link between the incidence of mental disorders and chronic poverty in Uganda, in which a vicious cycle of exclusion, poor access to services, low productivity, decreased livelihoods, and depleted assets exist [3]. There is also evidence that affected individuals and their families fail to become economically active [3]. Due to the high burden of diseases such as tuberculous, malaria, and HIV/AIDS, individuals also face emotional problems when coping with the physical and mental burden of these diseases. Medical staff are overwhelmed with the influx of these diseases and spend little time inquiring about the possible underlying emotional problems [1]. Further, mental health treatment in Uganda is limited as there is only one hospital in the country, known as the Mental Health National Referring Hospital in Butabika, that receives funding for mental health; however, the funding is still inadequate and the hospital does not have enough resources to support all the individuals with mental illnesses that need it [1,4].

An inquiry into why individuals with mental health problems do not seek support in Uganda discovered that seeking help is not only an individual action, but a social one, which must involve members of the individual's social circle [4]. Opposing views between spouses and other family members greatly influenced the help-seeking process. It was found that religious beliefs have a strong hold on views of help-seeking for mental health [4]. Notably, Christians tended to not believe that traditional healers are a means for treating mental illness [4]. In Uganda, some may believe that individuals who show signs of mental illness are bewitched or cursed by spirits resulting in these individuals being excluded from communities and being isolated [2]. This further contributes to stigma, as other individuals fear that they may also become ill if they come into contact with them [2]. Traditional healers are thought by some to be able to remove the curse from these individuals, but some medications they provide may cause physical harm and are not effective [2]. There have been reports that as many as 80% of those within Uganda's mental health hospitals had at some point received service from a traditional healer, delaying their medical care and exposed them to potentially harmful or coercive practices [1].

The National Mental Health Hospital at Butabika is struggling with discarded patients who are stigmatized in their communities and end up back at the facility [5]. Stigma also prevents individuals from obtaining employment, claiming state assistance, and accessing credit for equipment, land, or livestock [1]. This can also contribute to the delay in treatment because if one is unable to afford transportation or medication due to lack of employment, they will not be able to seek medical attention [1]. The employment of other members of the family may also be disrupted in order for them to care for the needs of the mentally ill individual [1,2]. Therefore, mental illness is a growing problem not just for the health of individuals and their families, but also for the economy.

## THE SOLUTION

It was noted in a study done by Petersen and colleagues that in Uganda there is a limited application of task shifting for identification and referral of mental illness [6]. There are only around 30 practicing psychiatrists and 230 mental health nurses in Uganda, which has a population of approximately 41 million people [7,8]. Therefore, with such a limited number of specialists it is important to task shift the identification process to nurses, doctors, and community health workers. Further, educating individuals who have a powerful influence in the communities can help de-stigmatize mental health. The study by Petersen and colleagues also noted that training community health workers in the village health teams was promising in improving identification and referral of people with mental illness [6]. The study also recognized that it wasn’t enough to just train the health workers at the health facilities, but to also train the community health workers as they are the ones that go into the communities [6].

It is mentioned by Copper and colleagues that there is a lack of educational programs and interventions at the community level for those who are mentally ill, despite research that has clearly shown how successful these outreach programs can be [5]. Thus there should be renewed efforts to educate individuals about mental health and illness to de-stigmatize mental health illness, provide universal treatment, and to empower individuals who are suffering.

In the study by Okello and Neema, it was shown that more discussion with patients resulted in patients providing explanations that included psychosocial dimensions of their illness that were linked to their social circumstances [4]. It was discovered that the doctors were only treating their physical symptoms and did not investigate the possible underlying psychological distress [4]. The study suggested that primary care providers need to receive training on how to recognize emotional problems and treat them appropriately [4]. To this end, healthcare workers need to be equipped to extract this information from patients, specifically that of the relationship between the somatic symptoms and emotional problems in order to effectively help them [4]. This, in turn, will treat the somatic symptoms in those patients whose physical ailments are often caused by emotional problems. This strategy will further help in alleviating the strain on the scarce health resources considering that these individuals who receive the correct treatment for their ailments, may not need to revisit the health clinics multiple times for the same unresolved conditions. This strategy is supported by a study by Petersen and colleagues which mentions that support in the form of knowledge and skills, is preferred over physical treatment alone [6].

Ultimately, the goal should be to create and implement an education program that will efficiently and effectively teach individuals about mental health and how mental illness is a medical condition that needs treatment, which will help to de-stigmatize mental health patients and provide individuals with the support they need.

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RESEARCH ARTICLE

# The Effectiveness and Challenges of E-learning in Surgical Training in Low- and Middle-Income Countries: A Systematic Review

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## ABSTRACT

E-learning encompasses the use of electronic media, online tools, and technologies in education and has been shown to be generally effective and satisfying for students, compared to traditional methods such as didactic lectures. Within surgical education, there is growing demand for e-learning platforms in low- and middle-income countries (LMICs). A systematic review was conducted to evaluate the effectiveness and challenges of e-learning for surgical trainees in LMICs. Out of 87 studies, five studies met the inclusion criteria and reported either neutral or positive improvements in cognitive and procedural skills, compared to baselines or controls for surgical trainees in LMICs. Using a qualitative synthesis approach, the researchers identified common challenges and barriers, such as low bandwidth, limited connectivity, and poor surgical details, which led to poor knowledge synthesis. This suggests that more emphasis needs to be placed on developing a strong online foundation that could be easily accessed and is user-friendly and intuitive, especially in LMICs. However, the research was limited by the lack of literature surrounding surgical e-learning interventions in LMICs and more research is required in this area.

## INTRODUCTION

E-learning represents learning facilitated by electronic technologies and involves accessing an educational curriculum outside of a traditional classroom, often in the form of interactive multimedia, audiovisual clips, and virtual models [1]. Current literature suggests that e-learning broadly encompasses a variety of teaching methods, such as virtual patient cases, online tutorials, and blended-learning styles that combine traditional didactic lectures with online components [2].

A major challenge within low-resource settings and low- and middle- income countries (LMICs) is that it is very difficult to increase the number of medical trainees, while preserving the quality of their training [3]. Often, this is due to the shortage of faculty in most medical schools in LMICs [4]. However, e-learning provides the opportunity to greatly improve the learning environment by teaching key concepts through readily available online resources and improving the medical faculty's availability. Of all LMICs, Brazil, Egypt, India, and South Africa have published the most articles on e-learning in medical education [5]. However, it is currently unclear whether surgical education provided through e-learning is effective in LMICs.

This systematic review aims to evaluate the effectiveness of e-learning for surgical trainees in LMICs by identifying changes in cognitive and psychomotor skills from baseline values such as traditional test scores and control groups without e-learning interventions. This review will also describe the challenges and barriers that were encountered with using various e-learning interventions to gain a better understanding of the possible recommendations moving forward.

## METHODOLOGY

Using the search terms 'global surgery' and 'e-learning', we searched for clinical studies in PubMed without restrictions from inception to July 2019, yielding 22 articles. Additionally, the reference lists of systematic reviews of e-learning interventions was also searched for surgical e-learning interventions in LMICs [3,5]. In total, 87 unique studies were identified (22 from PubMed and 65 from reference lists). Articles were included if: (i) they evaluated a surgical e-learning intervention, (ii) they were conducted in a LMIC as defined by the 2020 World Bank Data; (iii) study designs were experimental or observational (e.g. case-control, cohort, survey); and (iv) they reported clear outcomes.

Articles were excluded if: (i) they did not meet any of the four inclusion criteria; (ii) they were not primary literature; and (iii) they were not in English. 10 articles underwent a full review, and 5 articles met inclusion criteria. A PRISMA flowchart is available upon request.

Abstract screening and data extraction were conducted, and all outcomes and interventions were documented from included articles with respect to the following domains: country of study, participants, topic, type of e-learning intervention, psychomotor skills, cognitive skills, non-technical skills, challenges, and overall evaluations. Risk of bias (ROS) was conducted using the Newcastle–Ottawa Scale (NOS). The ROS is available upon request.

## RESULTS

From 87 unique studies, 56 studies were not primary literature, 1 was not in English, 12 were not conducted in LMICs, and 8 studies did not involve surgical e-learning, leaving 5 studies for inclusion, summarized in Table 1 [6-10]. Using the NOS for ROS, the 5 studies had total scores ranging from 5-8, with 2 studies being fair quality and 3 studies behind good quality. E-learning interventions include online modules with animations, video-conferencing of rounds, a web-based online course, the School of Surgeons educational website, and a blended-learning course [6-10]. All 5 studies demonstrated an improvement in cognitive skills after surgical e-learning and rated the e-learning intervention positively. Two studies utilized control groups with traditional learning interventions and compared it to e-learning interventions [7,8]. Mars found that there was no quantitative difference for knowledge acquisition between e-learning versus traditional learning, as measured by test scores [7]. Corrêa et al. found that students preferred teacher/traditional learning styles by a small margin as they were rated 10/10 compared to computer interventions of 9.5/10 [8].

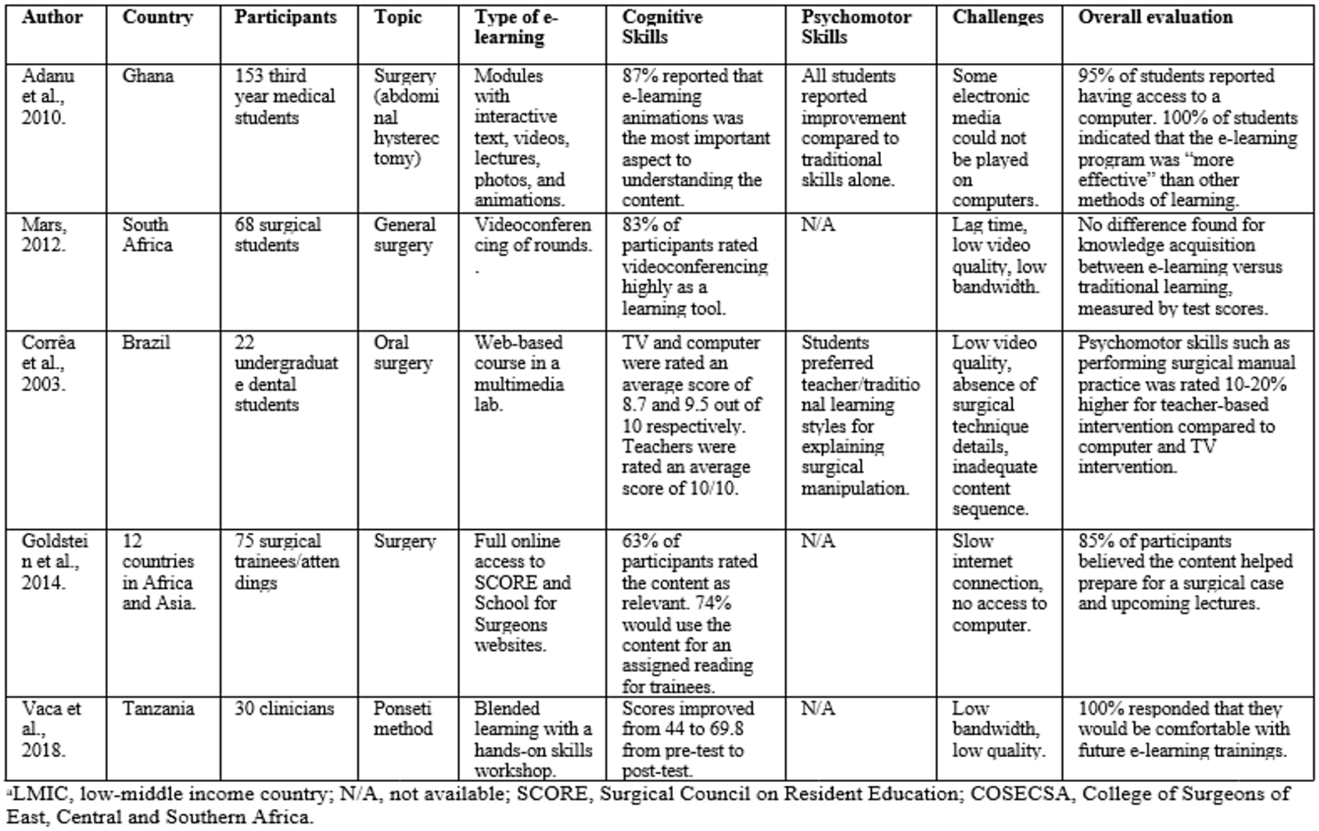
For psychomotor skills, only 2 studies reported students' perceptions [6,8]. Adanu et al. indicated that all students agreed the e-learning intervention improved their procedural skills; however, another study by Corrêa et al. found that students preferred teacher/traditional learning styles for explaining surgical manipulation, eliminating doubts, and correcting the surgical manual practice after exposure to both types of interventions [6,8].

Among all 5 articles, non-technical skills such as communication, situation awareness, decision-making, teamwork, and leadership were not tested or reported. There were similar challenges and barriers involved with the e-learning interventions: electronic media could not be played on some computers, costs of good bandwidth were very high and prohibitive, slow Internet connection speed led to lag time and decreased visual quality of videos and slides, absence of teachers/mentors, and absence of details in surgical techniques [6-10].

## DISCUSSION

Overall, these 5 studies showed similar cognitive improvements compared to the surgical e-learning interventions conducted in high-income countries identified by Jayakumar et al [3]. There was a comparable trend of improved test scores,

**Table 1.** Summary of e-learning surgical interventions in low- and middle-income countries (LMICs).



| Author | Country | Participants | Topic | Type of e-learning | Cognitive Skills | Psychomotor Skills | Challenges | Overall evaluation |
|---|---|---|---|---|---|---|---|---|
| Adanu et al., 2010. | Ghana | 153 third year medical students | Surgery (abdominal hysterectomy) | Modules with interactive text, videos, lectures, photos, and animations. | 87% reported that e-learning animations was the most important aspect to understanding the content. | All students reported improvement compared to traditional skills alone. | Some electronic media could not be played on computers. | 95% of students reported having access to a computer. 100% of students indicated that the e-learning program was "more effective" than other methods of learning. |
| Mars, 2012. | South Africa | 68 surgical students | General surgery | Videoconferencing of rounds. . | 83% of participants rated videoconferencing highly as a learning tool. | N/A | Lag time, low video quality, low bandwidth. | No difference found for knowledge acquisition between e-learning versus traditional learning, measured by test scores. |
| Corrêa et al., 2003. | Brazil | 22 undergraduate dental students | Oral surgery | Web-based course in a multimedia lab. | TV and computer were rated an average score of 8.7 and 9.5 out of 10 respectively. Teachers were rated an average score of 10/10. | Students preferred teacher/traditional learning styles for explaining surgical manipulation. | Low video quality, absence of surgical technique details, inadequate content sequence. | Psychomotor skills such as performing surgical manual practice was rated 10-20% higher for teacher-based intervention compared to computer and TV intervention. |
| Goldstein et al., 2014. | 12 countries in Africa and Asia. | 75 surgical trainees/attendings | Surgery | Full online access to SCORE and School for Surgeons websites. | 63% of participants rated the content as relevant. 74% would use the content for an assigned reading for trainees. | N/A | Slow internet connection, no access to computer. | 85% of participants believed the content helped prepare for a surgical case and upcoming lectures. |
| Vaca et al., 2018. | Tanzania | 30 clinicians | Ponseti method | Blended learning with a hands-on skills workshop. | Scores improved from 44 to 69.8 from pre-test to post-test. | N/A | Low bandwidth, low quality. | 100% responded that they would be comfortable with future e-learning trainings. |

[a]LMIC, low-middle income country; N/A, not available; SCORE, Surgical Council on Resident Education; COSECSA, College of Surgeons of East, Central and Southern Africa.

measured by an increase from pre-test to post-test scores or from baseline traditional learning scores. In a few instances, there was no significant improvement in test scores between the e-learning and traditional learning groups, suggesting that e-learning interventions were mostly either neutral or positive with respect to learning acquisition and retention [7].

However, the most similar outcomes were the positive reception and feedback to the e-learning interventions. Almost all participants reported that they enjoyed using the e-learning intervention and would recommend using it for other studies or recommend it to their colleagues [6-10]. They also believed the content helped them for upcoming lectures, surgical cases, and discussions with colleagues. Moreover, the e-learning programs were typically easier to access and could be replayed for enhanced understanding and retention.

Interestingly, while the surgical e-learning interventions were viewed almost entirely positively in the systematic review of surgical e-learning interventions in high-income countries by Jayakumar et al., the participants from LMICs reported several challenges. This suggests that while e-learning is a very useful resource and can provide similar or higher levels of knowledge and retention on surgical topics, care must be met in ensuring that students have high connectivity to the Internet and video resources [2].

With respect to procedural skills, all medical students in the study by Adanu et al., agreed that the e-learning intervention improved their understanding of the procedural skills [6]. However, in the study conducted by Corrêa et al, students preferred traditional teacher-based learning styles for "surgical manipulation" and "eliminating doubts" [8]. While e-learning could supplement some learning aspects of surgical procedures, direct observership is still required for conducting procedures. This could explain why blended-earning approaches are one of the most popular interventions as they combine learning facilitated by e-learning modules with hands-on workshops [5]. With respect to non-technical skills such as communication, collaboration, or teamwork, there was no available data found. This could be due to the difficulty in measuring and directly evaluating these non-technical skills [1]. While a common concern is that e-learning programs can lead to a lack of face time, professional isolation, decreased learning experiences, and fewer soft skills being developed, this still needs to be evaluated further [4]. Overall, the strength of evidence of this study is moderate as the ROS was low, but more studies are required. Limitations include lack of studies, particularly ones that examine non-technical skills, and trainee differences in experiences and expertise with using e-learning interventions.

## CONCLUSION

In this review, only 5 studies were found which evaluated the effectiveness of e-learning in surgical disciplines for trainees in LMICs. E-learning interventions reported neutral to positive test-scores and student satisfactions, but there were several challenges highlighted by technical issues such as low bandwidth, lack of connectivity, and poor IT resources. This suggests that more emphasis needs to be placed on developing a strong online foundation that could be easily accessed and is user-friendly and intuitive, especially in LMICs. With the high demand of healthcare workers and qualified medical educators in low-resource settings [3,4], E-learning can act as a tool to increase both the quality and quantity of medical and surgical educational programs. However, to do so requires in-depth stakeholder discussions and the development of an educational framework to ensure that these e-learning programs are sustainable and can be implemented into health systems. Our study identified that surgical e-learning interventions must have supporting IT resources in order to be effective, and when available, improves cognitive skills and is rated positively compared to traditional methods. Furthermore, blended-learning approaches may also be effective and should continue to be explored, as a means of combining lonline modules and hands-on workshops to augment psychomotor skills.

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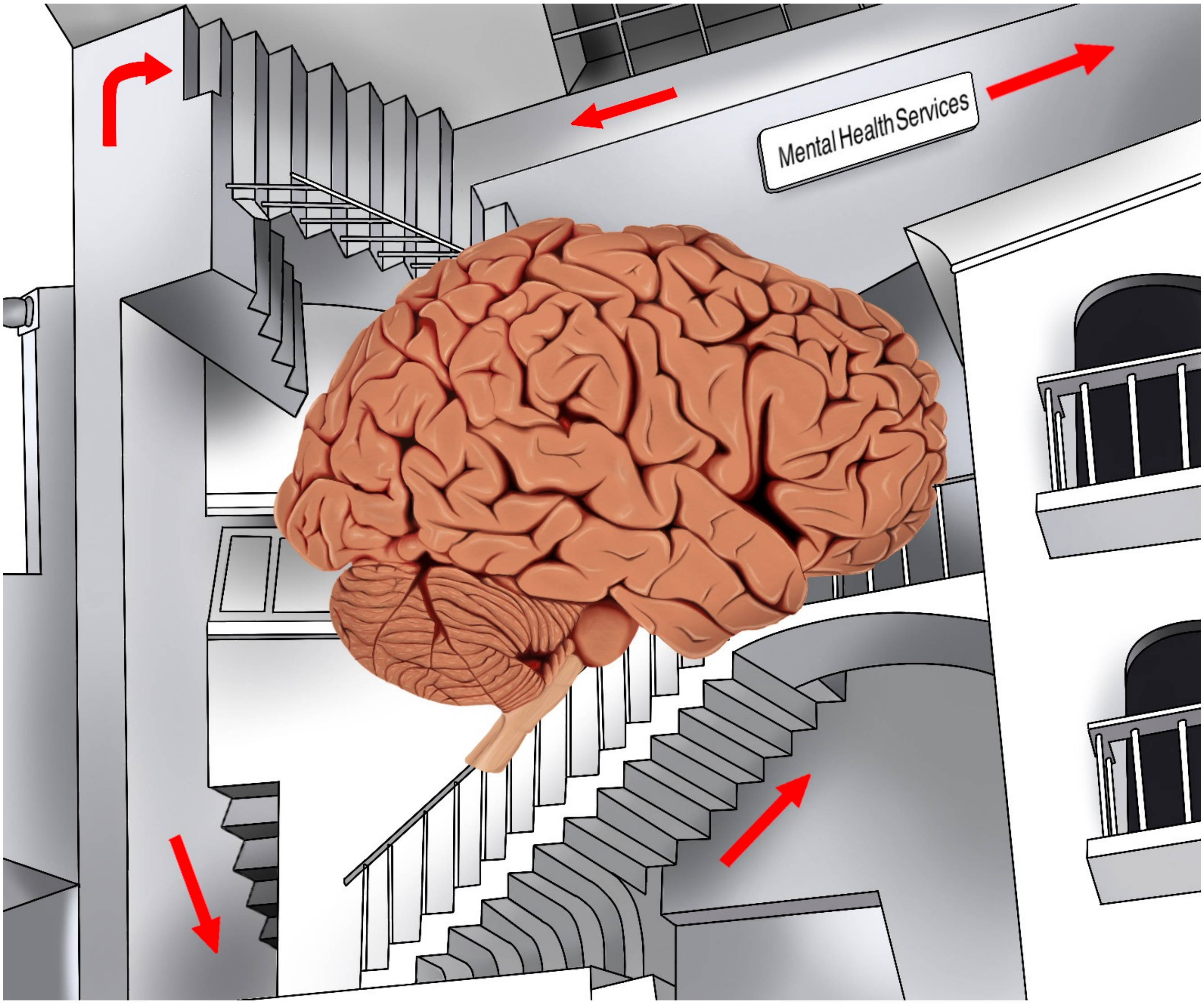

# Flight of Duality

*This piece was created to illustrate the lack of and difficulty in finding appropriate mental health services. The staircases represent the duality of hope and frustration when searching for professional help, while the focal point of the piece being the primary source of our psychological well-being is the human brain.*

*Art by Hunter Wagner*

# Reproductive, Maternal, Newborn, Child Health (RMNCH)

ZOOMING INTO CHALLENGES OF EQUALITY AND ACCESS AS THEY PERTAIN TO REPRODUCTIVE, MATERNAL, NEWBORN, AND CHILD HEALTH ACROSS THE GLOBE.

Photo Courtesy of Aastha Gulati

**OPINION EDITORIAL**

# Menstrual Hygiene Management in the Context of Displacement: Challenges and Next Steps

**Nicole Viscek**, McMaster University

Adequate menstrual hygiene management (MHM) is vital to the overall menstrual health and well-being of women and girls. When women and girls experience barriers to managing their menstruation, their ability to reach their full potential is limited [1]. Context plays a significant role in determining whether women and girls are able to access the appropriate information, materials, and services to adequately manage their menstruation in a dignified way. Accordingly, addressing menstrual health and hygiene must be a global health priority, especially for vulnerable populations including refugee or displaced women and girls, whose challenges regarding MHM are exacerbated. This article will shed light on the issue of MHM in the context of displacement, outlining the unique challenges displaced women and girls face in achieving adequate MHM and will follow with a brief exploration of existing literature on the global MHM response. The article will conclude with recommendations for further action, specifically in the area of research and evaluation of recent toolkits and guidelines to foster improved MHM program delivery and improve collaboration between multiple sectors.

Currently, we are living amidst the largest global displacement event in human history since World War II [2]. According to the most recent statistics, 70.8 million people comprised of refugees, internally displaced persons (IDPs), and asylum seekers, were forcibly displaced worldwide at the end of 2018, marking a new record high [3]. Ongoing conflict leading to threats of violence and persecution, as well as natural disasters and famine closely linked to climate change, all suggest an increase in future global displacement statistics [3,4]. Since women and girls comprise approximately half of the displaced persons worldwide, and the continuing rise in global displacement statistics over recent years continue to trend upward, the importance of addressing the issue of MHM in the context of displacement cannot be overlooked [3].

Poor menstrual hygiene has been associated with increased susceptibility to reproductive tract infections [5], which may increase risk of future reproductive health complications such as increased likelihood of acquiring STIs, pelvic inflammatory disease, and heightened risk of pre-term birth [6]. In addition to negatively affecting women's physical health, poor MHM may negatively affect educational attainment and cause psychosocial issues such as shame and embarrassment due to pervasive and enduring menstrual stigma/taboo [6,7]. Poor MHM is recognized to disproportionately affect marginalized and disadvantaged populations such as those living as displaced persons [8]. In the context of displacement, challenges to attaining adequate MHM may be unique to the stage and setting of a woman's migration journey, for example when in transit, or in rural, urban, or camp settings - but regardless of where these challenges exist, the inability to maintain adequate menstrual hygiene for proper health and well-being is recognized as a public health concern and a human rights issue [8,9].

The majority of the literature (both academic and grey literature) examining the challenges to MHM faced by displaced women and girls includes barriers to accessing at least one, if not all of the three main components that constitute MHM [10-17]; namely (1) access to MHM materials such as underwear, soap, (2) access to MHM infrastructure including sanitation facilities, and (3) access to MHM health and hygiene education [18]. For example, in Ugandan IDP camps, women and girls reported a lack of functioning locks on water, sanitation and hygiene (WASH) facilities resulting in safety and privacy concerns when needing to change their menstrual materials [13]. Displaced women and girls in Myanmar and Lebanon reported that distributions of MHM supportive materials could be infrequent leading to use of cloths rather than preferred disposable sanitary pads [12]. The literature has also demonstrated that challenges to access in these situations is further compounded by menstrual taboo/stigma [11-13,16]. Even when displaced persons find themselves in countries with reasonable healthcare access and supports, taboos around menstruation can hinder their willingness to seek help and discuss reproductive health issues related to menstrual bleeding with health care providers, as reported in a 2017 study of migrant women living in Canada and Australia [19].

There are also major challenges with regards to MHM program delivery in displacement settings. The literature has noted the lack of a coordinated multi-sector response resulting in confusion and lack of consensus amongst sectors on which MHM strategies would be most successful [12,14,18,20,21]. Efforts to develop and publish guidelines for MHM in the context of displacement have led to a number of new resources in recent years [20,22-26], with one of the most comprehensive and displacement-focused resources, the MHM in Emergencies toolkit [20], being released by Columbia University in 2017. Despite the availability of new toolkits and other resources on MHM, there is still no “gold standard” and further implementation and evaluation of their use in the field must be undertaken.

It is important to note that much of the literature that has outlined the challenges of MHM in displacement and subsequently informed the creation of current guidelines and toolkits was derived from research specific to displaced women and girls living in refugee or IDP camps. While extremely important, there is also a need to gain further insight into the challenges faced by women and girls that comprise displaced populations living elsewhere. For example, there are many displaced persons living in urban dwellings in cities along major migration routes, with the example of Athens, Greece, being a common choice of refuge for Syrian and Afghan migrants seeking shelter in the European Union [27]. Many grassroots non-governmental organizations (NGOs) in urban cities and elsewhere, step up to meet various needs such as those associated with MHM. Supportive partnership building is needed between academic institutions and grassroots NGOs to gain better understandings of challenges across a wider range of settings, as well as identify the use of and evaluate the effectiveness of toolkits and guidelines for MHM program delivery in the field.

Supportive partnerships have the potential to result in more sustainable funding avenues for NGOs and generate knowledge exchange useful for both academics and staff in the field. One such example can be highlighted through the pilot testing and evaluation of the MHM in Emergencies toolkit [20] in three refugee camps located in Tanzania [28]. The project was carried out through a partnership between Columbia University researchers, the International Rescue Committee (IRC) NGO and 13 local grass-roots organizations, ultimately leading to knowledge generation of the important components of introducing new technical guidance in the field, and improved clarity around organizational roles in MHM response [28].

MHM in the context of displacement therefore presents a unique opportunity for researchers to advance the progress made in this area of developing global health priority. Menstrual health and hygiene is vital to women and girls' health and well-being. Advancements in the area of MHM will help to meet the Sustainable Development Goals (SDGs) relating to healthy lives and well-being, gender equality and empowerment for women and girls, and water and sanitation, SDGs 3, 5, and 6, respectively [29]. Women and girls all around the world have a right to sufficient resources to adequately manage their monthly menstrual cycle in a healthy, safe and dignified manner.

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OPINION EDITORIAL

# Engaging South African Men in HIV Prevention: A Call for Gender-Sensitive and -Transformative Approaches

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## INTRODUCTION

South Africa (SA) currently has the highest human immunodeficiency virus (HIV) prevalence rate in the world. According to most recent estimates, approximately 20.4% of the nation's adult population is living with the disease, which is equivalent to 7.52 million people [1]. The steep trajectory of the HIV/AIDs crisis in South Africa has been attributed to a denialist government's lack of response and numerous missteps during the epidemic's early stages. Fortunately, this has changed in recent decades [2], and the South African government has made significant commitments to tackling HIV on a national scale. Today, SA has the greatest number of people on antiretroviral therapy (ART) in the world and has made universal access to treatment a top priority [2]. In 2016, it was reported that 56% of people living with HIV were in fact accessing ART [3]. However, despite these definite strides towards progress, there continue to be high rates of new HIV infections. These rates are most prominent amongst people aged 15-49, a group that comprises an important reproductive and working sector of the population [4]. Recent studies suggest that potential reasons for this may include a decline in condom use during sexual intercourse across several age groups, and a decline in knowledge levels about sexual and reproductive health [5]. These changes have also been accompanied by an increase in risky sexual behaviours [5]. Altogether, these findings point to a serious need for reconsidering HIV prevention approaches in the country.

## NEGLECT OF HETEROSEXUAL MEN

The neglect of heterosexual men in particular comprises a significant gap in HIV prevention. In SA, the focus of the HIV epidemic has been oriented towards women and children. In 1999, HIV/AIDs researchers Exner et al. labeled heterosexual men as "the forgotten group in the HIV epidemic" [6]. Historically, due to their perceived secondary status in a highly gendered society, as well as a general lack of sexual autonomy and biological susceptibility, women have been deemed more vulnerable to HIV [6]. In contemporary research, this conceptualization of women has sometimes been referred to as the "vulnerability paradigm" [7].

Consequently, most HIV-related public health efforts, including testing, care, and treatment, has specifically targeted women, especially those of child-bearing age [8]. Thus, while men are understood to be active HIV transmission agents, they have not always been engaged as active agents in prevention efforts. This is a reality that persists into today. Regrettably, the social conditioning and gender roles that increase risks of HIV infection, have been deemed immutable and not adequately targeted in HIV prevention efforts [7]. Due to these factors, the HIV risk of heterosexual men in SA has remained largely unaddressed.

This is problematic for multiple reasons. First, while men experience many risks related to HIV infection, prevention resources are primarily affixed in healthcare centres and hospitals. Unfortunately, these settings tend to be underutilized by men [8]. Extensive research has been conducted, evaluating

major differences in health seeking behaviours between men and women. Overall, it was demonstrated that South African men were less likely to seek out medical care when compared to their female counterparts [9]. Similarly, they also tend to be more advanced in their disease progression when finally seeking help [10]. Men have also been shown to be less likely to undergo HIV testing and know about their disease status compared to women [11]. Testing can be seen as threatening traditional norms of masculinity [11].
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Secondly, HIV infection in young South African men has been associated with a number of risky health and sexual behaviours [8]. For instance, a significant number of men have reported substance abuse with alcohol, marijuana, methamphetamine and methaqualone [12]. Polysubstance abuse is also well established as a major factor in risky sexual behaviour [13]. South African men also report high levels of concurrent sexual relationships, low levels of condom usage, and repeat incidences of sexually transmitted infections [14]. Through these behaviours, South African men increase not only their own HIV risk, but also that of their female partners.

## MOVING TOWARDS GENDER-INFORMED PREVENTION

Due to discouraging trends in health-seeking behaviours, coupled with the propensity for engaging in risky sexual behaviours, men should be considered important targets for HIV prevention. In SA, the prevention landscape has been dominated by clinical and medical approaches to reduce the rates of HIV transmission. These include condom promotion, voluntary circumcision and pre-exposure prophylaxis (PEP) [15-17].

However, behavioural or combination approaches, which have not yet been adequately developed offer a unique opportunity to halt risky sexual behaviours by considering broader social and community level contextual factors, such as gender roles and inequalities [18].

In order to successfully engage heterosexual men in HIV prevention, I suggest the use of gender-sensitive and gender-transformative programs that not only acknowledge dangerous gender norms, but also openly challenge them. While programs employing similar methods, namely Stepping Stones and the Sonke Gender Justice Network, have operated in SA, this type of prevention is still in its nascent stages and requires further development [19].

Fortunately, in 2014, the Joint United Nations Programme on HIV/AIDS (UNAIDS) also developed a gender assessment tool (GAT) for countries wishing to implement national-scale HIV responses [20]. The main objectives of the GAT are to assess the HIV epidemic in a country; and develop a context-specific response to the epidemic, with a gendered perspective and acknowledgment of persistent definitions of masculinity.

## CONCLUSION AND RECOMMENDATIONS

In order to truly curb the rates of new infections, as well as reduce HIV related mortality, South African men need to be targeted in prevention efforts, including state-led programming. I suggest four major recommendations in order to engage heterosexual men in HIV prevention strategies. First, it is important that HIV-prevention programs abandon a gender-neutral approach, and consider the implications posed by differing social structures and norms for men and women. In particular, gender-theories should help inform the development of prevention programming for heterosexual South African men, as they can provide significant insights and context into their risky sexual behaviours. A useful tool for developing such programs is the new gender assessment tool (GAT) created by UNAIDS.
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Second, it is important that gender-transformative and gender-sensitive programs are monitored and evaluated on a regular basis. Specifically, researchers should assess i) how changing notions around masculine norms and educating men about gender ideology will impact their behaviours and ii) whether such changes in behaviour are long-term and withstanding.

Third, the development of HIV prevention programs should be an interdisciplinary process. As demonstrated by literature, combination prevention efforts (employing biomedical, behavioural and structural approaches) are preferred due to their long- lasting impact on reducing HIV incidence [21]. Implementing such successful combination prevention programs, that are also gender-transformative in nature, requires a maximizing of synergies across several fields including biology, medicine, psychology, sociology, politics, and epidemiology, etc.

Lastly, while this article addressed the HIV landscape in South Africa as a whole, it is important to acknowledge that the nation is heterogeneous in nature. Norms of masculinity and femininity are heavily reliant on socio-cultural surroundings, which differ with region, class, ethnicity, and religion. In order for a prevention program to be successful, it is important that a thorough analysis of the context in which it will operate is done during the development stage. I think that these measures will altogether help address the dire need for gender nuanced HIV prevention approaches needed to address the challenge of HIV in South Africa.

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RESEARCH ARTICLE

# The Risk of Bias in Randomized Controlled Trials

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## ABSTRACT

Randomized controlled trials (RCTs) are vulnerable to internal and external bias, particularly when examining complex health behavioural interventions. The effects of postnatal education interventions on parent's knowledge of caring for their newborn in low-and middle-income countries (LMICs) is a growing area of study. Therefore, the aim of this review was to assess the risk of bias (RoB) in such studies. MedLine, CINAHL, and SCOPUS were searched from January 2000 - October 2017 using key words such as RCT, parent-targeted, postnatal, education, interventions, and LMICs. Two reviewers screened title and abstracts and full text of eligible studies. Outcomes of interest were RoB measured using the Cochrane RoB tool, as well as intervention fidelity and contamination bias. Data were descriptively analyzed with 29 RCTs included. Highest risk of bias was in participant (55%) and personnel (76%) blinding with the lowest risk of bias in random sequence generation (76%), and attrition bias (72%). Overall, 89.7% of studies on postnatal parent-targeted education interventions in LMICs had a high RoB score in at least one domain. While difficult to avoid such biases, opportunities can be sought to minimize these during the design and conduct of future studies in this area.

## INTRODUCTION

The goal of evaluating health behavioural interventions is to offer strong evidence that changes in the desired outcome are attributable to the intervention, holding other factors constant [1]. While randomized controlled trials (RCTs) hold promise and rigor in evaluating interventions [2,3], they are vulnerable to bias. Systematic errors occur due to a flaw in the RCT design, conduct, or analysis, resulting in either an over- or under-estimation of the effect size [4]. Given social and gendered norms, available resources and capacity, or nuanced confounding factors that may influence the implementation and effectiveness of interventions, there can be a potential risk of bias (RoB) when conducting global health intervention trials in low-and middle- income countries (LMICs).

Recently, there has been an increase in the number of parent-targeted postnatal educational interventions in LMICs, with the goal of enhancing parents', particularly mothers', knowledge and ability to care for their newborn at home [5]. Parent-targeted postnatal educational interventions are "structured interventions where parents are provided with education or information related to caring for their newborn that is meant to change behaviour and improve newborn outcomes" (p.61-62) [5,6]. For the purpose of this study, parent-targeted postnatal educational interventions must have been related to improving one or more essential newborn care behaviours (e.g., breastfeeding, skin-to-skin contact) that began after birth and before six weeks postnatally [5].

Despite the increasing use of these interventions, the quality of RCTs is yet to be examined. Therefore, the objective of this review was to examine the RoB in RCTs of parent-targeted postnatal educational interventions in LMICs using the Cochrane Collaboration RoB tool.

## METHODOLOGY

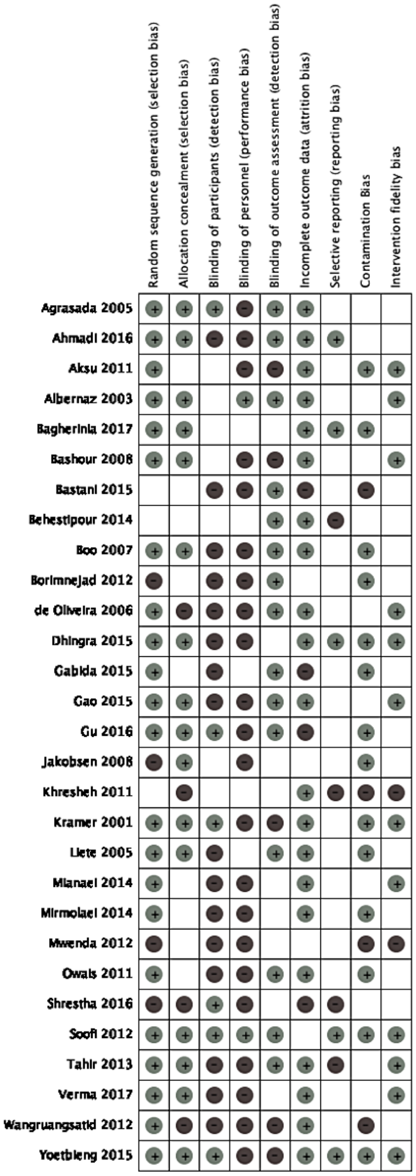
This analysis is based on RCTs identified through a scoping review [5]. Full details of the search, inclusion and exclusion criteria, and data extraction procedure are available in the original study [5]. The Cochrane Collaboration RoB standardized tool was used [7]. When considering the risks in parent-targeted postnatal intervention and global health research more broadly, and following other studies evaluating RCTs in LMICs [9,10] and on behavioural interventions [11,12], two additional bias domains were added: contamination bias [7] and intervention fidelity bias [8].

## RESULTS

The original search identified 77 studies and after non-RCTs (n=45) and secondary analyses (n=3) were excluded, 29 RCTs remained. The number of publications increased over time: 2 between 2000 and 2004, and eleven between 2015 and 2017. Most of the studies were randomized at the individual level (n=24, 82.8%) with five cluster RCTs (17.2%).

Figure 1 illustrates the RoB for each of the studies and Figure 2 illustrates the RoB graph as percentages across included studies. Among all the studies, 26 (89.7%) had a high RoB score in at least one domain with an average of 2.3 domains with a high risk of bias (range: 0 - 6).

Most studies had a low RoB for random sequence generation (72.4%) but only 51.7% had low RoB for allocation concealment. Biases occurred due to poor concealment, sequence generated by odd/even number, or the use of non-sequentially numbered or opaque envelopes.



| | Random sequence generation (selection bias) | Allocation concealment (selection bias) | Blinding of participants (detection bias) | Blinding of personnel (performance bias) | Blinding of outcome assessment (detection bias) | Incomplete outcome data (attrition bias) | Selective reporting (reporting bias) | Contamination Bias | Intervention fidelity bias |
|---|---|---|---|---|---|---|---|---|---|
| Agrasada 2005 | + | + | + | − | + | + | | | |
| Ahmadi 2016 | + | + | − | − | + | + | + | | |
| Aksu 2011 | + | | | − | − | + | | + | + |
| Albernaz 2003 | + | + | | + | + | + | | | + |
| Bagherinia 2017 | + | + | | | | + | + | + | |
| Bashour 2008 | + | + | | − | − | + | | | + |
| Bastani 2015 | | | − | − | + | − | | − | |
| Behestipour 2014 | | | | | + | + | − | | |
| Boo 2007 | + | + | − | − | + | + | | + | |
| Borimnejad 2012 | − | | − | − | + | | | + | |
| de Oliveira 2006 | + | − | − | − | + | + | | | + |
| Dhingra 2015 | + | + | − | − | | + | + | + | + |
| Gabida 2015 | + | | − | | + | − | | + | |
| Gao 2015 | + | + | − | − | + | + | | | + |
| Gu 2016 | + | + | + | − | + | − | | + | |
| Jakobsen 2008 | − | + | | − | | | | + | |
| Khresheh 2011 | | − | | | | + | − | − | − |
| Kramer 2001 | + | + | + | − | − | + | | + | + |
| Liete 2005 | + | + | − | | + | + | | + | |
| Mianaei 2014 | + | | − | − | | + | | | + |
| Mirmolaei 2014 | + | | − | − | | + | | + | |
| Mwenda 2012 | − | | − | − | | | | − | − |
| Owais 2011 | + | | − | − | + | + | | + | |
| Shrestha 2016 | − | − | + | − | | − | − | | |
| Soofi 2012 | + | + | + | + | + | | + | + | + |
| Tahir 2013 | + | + | − | − | + | + | − | | + |
| Verma 2017 | + | + | − | − | | + | | | + |
| Wangruangsatid 2012 | + | − | − | − | − | + | | − | |
| Yoetbieng 2015 | + | + | + | − | − | + | + | + | + |

**Figure 1.** Risk of bias summary: Authors' judgements about each risk of bias item for each study.

Over half had high RoB for lack of blinding participants (55.2%) and personnel (75.9%). For detection bias, only 51.7% had a low RoB. Due to the nature of postnatal education as structured, interactive interventions, double-blind trials are not always possible as mothers are aware of whether they received education or not. Many of the studies used a single-blind RCT design which meant participants were unblinded to their group allocation.

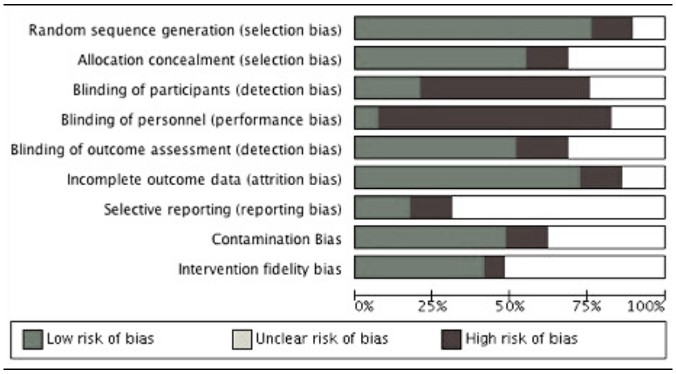


**Figure 2.** Risk of bias graph: Authors' judgements about each risk of bias item presented as percentages across all included studies.

Regarding attrition bias, over two-thirds were low RoB (72.4%) due to good reported follow-up rates, balanced withdrawals across groups for similar reasons not related to treatment or use of intention-to-treat analysis. However, a challenge was that attrition resulted in loss of power during analysis and inability to draw strong conclusions. Nearly all studies (n=26, 89.7%) stated their power calculations for their sample sizes but only 18 (69.2%) maintained this sample size at the final data collection point. For reporting bias, only four studies (13.8%) were considered low RoB as most trials were not registered or were retrospectively registered after data collection began.

While almost half of the studies had low risk of contamination bias (48.3%), 37.8% had an unclear risk. Low risk of contamination bias occurred where interventions did not have an in-hospital component or used cluster RCTs to reduce the likelihood of one group becoming aware of information available to the other group.For the studies that did have an in-hospital component, measures were taken to reduce contamination such as the use of private rooms for training. However, this was not always clearly stated.

For intervention fidelity, 48.3% had an unclear risk due to unclear reporting on maintaining the same intervention across participants. 41.4% had low RoB as they provided statements that training for implementers was provided.

## DISCUSSION

The variation in RoB for RCTs on parent-targeted postnatal education interventions in LMIC is not new [13–15]. Previous studies suggest that RCTs on non-communicable diseases using pharmacological and non-pharmacological treatments published in middle income countries were more likely to have a higher RoB and be of lower quality compared to those published in high income countries [15]. In Sub-Saharan Africa, 76% of RCTs on pharmacological and non-pharmacological treatments had at least one domain at high RoB [14].

The areas of greatest concern were in blinding of participants and personnel. The strength of RCTs lies in the successful randomization of participants which allows for the groups to be as similar as possible at the beginning to determine the effects of the intervention at the end [4]. It is challenging to conduct a double-blind trial for a postnatal educational intervention as the personnel working on the study may be required to provide the intervention based on the allocation and thus will be aware which participant is receiving which intervention. While double blinding for this type of intervention is a challenge, it is important and possible to blind outcome assessors and those doing the analyses.

It is important to consider ways to reduce risk of contamination bias, particularly in global health RCTs in LMICs where overcrowding in hospitals increases the possibility of cross-contamination and can threaten the validity of the control group [1]. Ideally, the intervention would be delivered uniformly to all participants without cross-contamination, yet this may not happen due to the interactive nature of postnatal educational interventions [11].

Challenges exist in conducting RCTs in resource/infrastructure limited LMIC settings and there may be a need for additional resources (such as training, funding, infrastructure) to help achieve the expected level of rigor. It also raises the question that if these elements of rigor are not possible, what alternatives should be considered? Guidelines such as the Medical Research Council's management of global health trials provide important recommendations for the conduct of RCTs specifically occurring in LMICs [16]. Consideration is needed in relation to the availability of research infrastructure where additional training for personnel involved in the RCT may be required [17]. Also, there is a need to recognize the healthcare workforce challenges faced in many LMICs where healthcare providers might not have time to dedicate to research [17].

Beyond specific design measures that can be used to reduce RoB, minimizing risks can also occur through collaboration and partnership between researchers from high income countries experienced in RCTs and LMIC researchers. Capacity development of personnel in LMICs is needed to strengthen the workforce, minimize RoB, reduce risk of exploitation of participants, ensure ethical standards are met, build the project towards sustainability, ensure cultural awareness, and meet local needs [18,19]. Collaboration can help overcome some of the barriers to conducting RCTs in LMICs, including the capacity of healthcare providers to engage in research in addition to their clinical care; finance, resource, and personal constraints; as well as identifying and collaborating with gatekeepers, all of which may impact bias.

## CONCLUSION

Overall, 89.7% studies on postnatal parent-targeted education interventions in LMICs had a high RoB score in at least one domain. While difficult to avoid such biases, opportunities can be sought to minimize these during the design and conduct of future studies in this area.

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OPINION EDITORIAL

# The Tale of Two Practices: An Overview of the Discourse Surrounding Genital Mutilation

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## INTRODUCTION

A contemporary issue affecting children globally is genital mutilation, defined as the "non-therapeutic alteration of children's genitals" [1]. The nature of these practices in females and males largely differ due to their respective social contexts. Dominating Western perceptions often view female genital cutting (FGC) as a human rights violation, whereas notions of health benefits have crafted a positive lens for male circumcision (MC) [2-4]. This commentary will explore the differential discourse surrounding FGC and MC practices.

## HISTORICAL BACKGROUND

It has been proposed that FGC originated in Ancient Egypt due to the discovery of circumcised mummies [5]. The practice is theorized to be associated with preserving a girl's purity, a requirement for marriage [5]. FGC is also believed to protect the femininity and sexual propriety of young girls and women to assure monogamy in marriage [5,6]. Another theory suggests that the practice signals the emergence of adulthood [6]. Finally, FGC is perceived to improve a woman's hygiene, whilst increasing her fertility [6]. The practice can be further propagated by religious leaders, making the religious basis for FGC an issue of contention [7].

Similarly, there are different theories of origin for MC. One theory suggests that the spread of circumcision originated from a heliolithic culture [8]. The prevalence of circumcisions in Ancient Egypt is supported by inscriptions on the sarcophagus of Ankh-ma-Hor [9]. Another theory proposes that circumcision originated in different cultures independently [8]. Depending on the culture or religion, circumcision can be performed at various stages of life [8]. In some African tribes, babies are circumcised at birth, and in Judaism, circumcision is performed on the eighth day after birth [9]. In Islam however, circumcision is generally performed in adulthood as a "rite of passage" [9].

## CURRENT SITUATION

FGC is defined as the removal or injury of the female external genitalia for non-medical reasons [10]. In 2015, approximately 44 million girls under the age of 15 have experienced FGC [11,12]. Over half of the affected individuals have been from Indonesia, Egypt, and Ethiopia [11]. Notably, some West African countries have seen large decreases, while countries, like Yemen and Iraq, have experienced increases [11]. In 1997, an official international statement was issued, calling for the abandonment of FGC [12]. The practice is now banned in 26 African and Middle Eastern countries and 33 countries with migrant populations that practice FGC [4]. Despite the steady decline in FGC, there is concern that rates could increase over the next 15 years due to population expansion and other contextual factors [11,13].

MC is a surgical procedure involving the removal of the penis foreskin [14]. Globally, approximately 64% of newborns receive circumcision [15,16]. MC is conducted universally in areas such as the Middle East, West Africa, Central Asia, Canada, and Turkey. In the U.S., controversy over the practice of circumcision persists [9]. The 2007 Federal Prohibition of Genital Mutilation Act was passed to protect populations, such as young boys and intersex individuals, from genital mutilation [9]. Similarly, Australia has banned circumcisions in public hospitals, and laws in South Africa prohibit this procedure for minors unless performed for religious or medical reasons [14].

## DIFFERENTIAL DISCOURSES

There is a global focus on FGC due to the associated health complications, which range from short-term consequences like infections and shock to long-term issues such as psychological problems [4,12]. The World Health Organization has led global efforts by educating communities on the severity of this issue [17]. The creation and implementation of resolutions within the United Nations have led to the production of policies as a means to assess the efficacy of anti-FGC programs [17]. Programs implemented in countries, like Somalia, acknowledge the cultural significance of FGC and work to alter the perceptions of traditionalists and uplift the social status of females, without genital cutting [18]. Ultimately, the health consequences have created an image of severe human rights violations that requires aggressive intervention.

MC differs from FGC due to the documented positive health outcomes of circumcision. In 2007, the American Academy of Pediatrics concluded that the health benefits of circumcision outweigh the risks of complications [19]. Health benefits from properly conducted circumcisions include decreased risk of urinary tract infections, sexually transmitted diseases, and penile problems and cancers [15]. Additionally, the Center for Disease Control reported that newborn circumcised males reduced their risk of acquiring HIV by 15% [15]. This is due to the foreskin being susceptible to cuts, allowing for bacteria and viruses to penetrate [15]. The Joint United Nations Programme on HIV/AIDS stated that countries experiencing a high prevalence of the disease should increase access to circumcision resources [15]. In particular, circumcisions performed on young children have been documented as a cost-effective preventive method for HIV infection in Sub-Saharan Africa [20]. Thus, these positive impacts have shaped the image of MC as medically beneficial.

However, these narratives have narrowed perspectives on FGC and MC. The Western mindset views FGC as an incredibly harmful practice that must be eradicated. Alternatively, MC has failed to recognize the controversy surrounding unsafe circumcision. The discourse surrounding FGC fails to account for its interpretation in various social contexts and instead views the issue through a Western lens [1]. Cultural interpretations of FGC often regard the practice as a rite of passage for beautification [21]. By contrast, global activism has misconstrued the view of female sexuality in these cultural contexts and instead imposed Western conceptions of female sexuality [22]. Since the perception of FGC took root in Western feminism, it is viewed as a human rights violation [22]. Promoting FGC as oppressive may place Western ideals at a higher moral ground, while ignoring perspectives of FGC survivors [21,22].

For MC, the perceived health benefits have created a narrative that fails to recognize the harms of certain MC procedures. MC is usually associated with safe procedures and sterile environments [23]. However, this negates that boys may also be victims of unsafe cutting. The full complexity of MC is not considered due to the one-dimensional discussion around MC [23]. While MC has been co-opted as a medical procedure to aid in the reduction of certain health conditions, the practice of unsafe procedures can cause long-term genital health issues.

## CONCLUSION

This commentary provides an overview of genital mutilation by examining various aspects of FGC and MC. Overall, the perception of health impacts for female and male cutting are fundamentally separated in society, which has resulted in conversations around these matters to only consider one type of narrative.

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OPINION EDITORIAL

# Addressing the Maternal Health of Female Sex Workers and the Health of their Children: A Call for a Family-Centered Approach to Vulnerable Families

**Heather Thompson,** Global Health Promise; **Brian Willis**, Global Health Promise

## INTRODUCTION

Awareness of the unmet health needs of marginalized populations is increasing: even prominent journals such as the Canadian Medical Association Journal and Lancet have focused recently on vulnerable populations. However, while many marginalized groups have been receiving attention from the global health community, two significant populations remain largely neglected: female sex workers (FSW) who become pregnant, and children of FSW. These two groups are also among the most stigmatized people globally, which contributes to their ongoing neglect in research, funding, and programming.

FSW are a heterogenous population including women who are trafficked and women who turn to sex work for economic reasons, which is often to earn money to feed and raise their children [1]. FSW and their children live in every country, and even those in the richest countries are marginalized and suffer greatly [2]. Most FSW share similar challenges including poverty, stigma, and discrimination, all of which contribute to significant barriers to health services [3]. This includes barriers to quality antenatal care and safe delivery.

Currently, most of the focus on FSW is on HIV and there is little awareness of their health needs when they are pregnant, or their needs as mothers. There is even less awareness about the health and social needs (including school) of tens of millions of children whose mothers support them through sex work. The lack of research and data on the maternal health of FSW reflects the fact that these women are rarely viewed as mothers in either research or policy decisions. Many FSW experience severe stigma in their communities, often avoiding services and thus leading to adverse health outcomes for themselves and their newborns.

Regardless of how societies, international NGOs, global funders, and governments, view FSW and their children, we must recognize that they are families too. This perspective is critical to providing comprehensive care to FSW and their children. In this Opinion Editorial, we call for family-centric care for FSW their children and for all services they require to be healthy, and to enjoy the same rights as all other women, children, and families.

During the novel coronavirus pandemic, this approach to providing support to very marginalized women and their children is now of even greater need. Many of these families were already experiencing high levels of food insecurity, serious health problems, and barriers to healthcare, and the pandemic will only intensify this crisis. NGOs, government agencies, and UN organizations must take collective action to ensure that during the pandemic these families are protected, and are able to access and receive the services that they need.

## LACK OF DATA ON FSW WHO ARE PREGNANT OR MOTHERS, AND THEIR CHILDREN, IMPACTS POLICIES AND PROGRAMS

Globally, most female sex workers (FSW) are mothers. For example, studies report: 74.8% of FSW in South Africa had at least one child; 82% of FSW in Kenya are mothers; 51% of FSW in Russia have children; and 68% of FSW in Canada have children [4-7].

However, there is little recognition of FSW as mothers. Although most FSW are mothers, many studies of FSW do not even mention which of the participants in the studies are mothers, while other studies that do include data on FSW with children, often will only focus on one isolated health issue, (e.g., HIV), ignoring potential differences between FSW in the study who are mothers and those who are not [8,9].

The failure to disaggregate the results between FSW who are mothers (some of whom may have five or more children) with study participants who do not have any children, may influence their interpretation. We don't know if, or how, motherhood affects other health outcomes in these women , and overall many studies disregard the potential impact of motherhood on these women's health. This lack of data compromises our ability to understand if the risk to FSW from health issues, such as violence, HIV, or mental health issues, could be related to the number of children that they raise.

Why is this a problem? We rely on studies to guide policies and programs. This is especially critical for policies and programs for very vulnerable and marginalized populations, such as FSW, who are at high risk for many serious health problems, such as HIV or mental illness.

## MATERNAL HEALTH OF FSW: A RESEARCH, PROGRAM, AND POLICY BLIND-SPOT

Currently, care and research of FSW globally is often viewed through an HIV-focused lens. Maternal health of FSW and the health of their children is often ignored. A holistic, family-centered approach addressing the concerns of these vulnerable mothers for their families is critical to improving their health.

Although the majority of FSW become pregnant and are mothers, there are few studies on pregnancy among FSW [10]. Equally important, there are few studies on their pregnancy outcomes, including maternal morbidity and mortality [11]. There has been a great global effort to reduce maternal mortality, which has been effective in many countries. However, there is still a lack of data and understanding on the toll of maternal mortality among FSW.

During our discussions with FSW at Global Health Promise, we often hear many reports of pregnant FSW who work until they go into labour and then return to work within hours or days of giving birth. Many also report delivering at home without a skilled attendant. Moreover, the death toll we observe from unsafe abortion is shocking. Many of the NGOs we work with have been appalled by our programmatic data, as no one has previously addressed maternal health issues specifically in this population to realize the high rates of mortality that occur. FSW who become pregnant and their children are among the most vulnerable populations in the world, yet there is little focus on their maternal health and the health of their children. Globally, the funding targeted to FSW is generally focused on HIV and while prevention and treatment of HIV among FSW is clearly important, so too is quality antenatal and intrapartum care for pregnant FSW, as is health care for their children.

Based on our work with FSW and their children, we strongly suspect that their all-cause and maternal death rates are much higher than other mothers and children in developing countries. However there is such a lack of research and focus on this extremely marginalized group that it's difficult to know the true scale of the problem. Although these issues are not well known among researchers, funders, or service providers, they are obvious to FSW and their children.

There is even greater lack of data and awareness about the health and social well-being of tens of millions of children of FSW. In a literature review we conducted on studies of FSW and their children over the past three years, only 1.9% of all the studies specifically focused on the children. [Willis; unpublished].

Maternal health of FSW and health of their children falls in a gap for research and services: there is funding for research and services related to HIV among FSW, but this does not include research on maternal health of FSW or services for pregnant FSW. Based on our experience, most maternal health programs do not specifically target services to FSW as do HIV programs. Two factors for this lack of targeted services to FSW by maternal health programs include an assumption that FSW are cared for by HIV programs, and a lack of data that provides the evidence about the unmet maternal health needs of FSW. This must change: maternal healthcare for FSW, healthcare for children of FSW, and protection from abuse and sexual exploitation are all critical human rights and must be prioritized. A holistic, family-centered approach would help prevent this siloed approach.

The lack of data on maternal health of FSW means that sex worker led NGOs do not have the information they need to advocate for maternal health of FSW and provide services. These services could include accompanying pregnant FSW to the hospital for clinic visits or during childbirth. Just as donors support sex worker NGOs to address HIV prevention and treatment, they must also fund them to address maternal health of FSW. We must also ensure that sex worker organizations are fully engaged in the research on maternal health of FSW and on children of FSW.

## BARRIERS TO CARE: STIGMA AND SILOES

Because many FSW are stigmatized and rarely viewed as mothers, there is a risk that they will not receive the maternal health services they require as well as be ignored in research on maternal health.

Our nonprofit, Global Health Promise focuses on the maternal health of FSW and the health of their children. Over the course of our work we have talked to hundreds of FSW in numerous countries about their maternal health and the health of their children. Many women report stigma, discrimination, and other barriers when seeking antenatal care. These mothers also report programs that do provide care to them, primarily for HIV, do not provide antenatal care nor have any funding for services for their children. A handful of women even expressed that they wished they had HIV, in order to access better services for themselves and their children.

Many pregnant FSW are stigmatized in all aspects of their daily lives, including in healthcare facilities. FSW report that healthcare providers often humiliate them when they seek prenatal care and during labour and childbirth. This treatment violates WHO recommendations on respectful maternity care, which state that all women should be entitled to care during pregnancy and childbirth that maintains their dignity, privacy and confidentiality [12]. This treatment is not only a violation of the human rights of FSW according to the WHO, but also increases their risk of maternal morbidity and mortality when they choose to give birth alone or with an unqualified traditional birth attendant, rather than endure the disrespect or even refusal of care they all too often experience in medical facilities.

Many children of FSW experience marginalization due to the situation of their mothers. As with their mothers, this treatment not only violates their rights to receive care, but also increases their risk of death when their mothers wait too long to seek medical care, or seek treatment from an unqualified health provider in order to avoid healthcare facilities where they and their children are often mistreated. Although these issues are not well known among researchers, funders, or service providers, they are obvious to FSW and their children. By talking to FSW about their families' needs, the importance of often-ignored issues is clearly illuminated.

## PROGRAMMING AND SERVICE NEEDS OF FSW AND THEIR CHILDREN

We propose that the health of FSW and their children must be viewed in a family-centered context. Rather than viewing FSW primarily from an HIV perspective, we must recognize FSW as mothers with maternal health needs, and that their children need care too. We should provide comprehensive health to these families.

This family-centered care for FSW and their children should be provided in a location and time that is convenient for mothers and be staffed by providers who treat the FSW with respect and dignity.

Moreover, in our discussions with FSW, barriers to antenatal care include the time it takes to wait for an appointment. For pregnant women who are married and have a husband who will provide meals, waiting for hours in an antenatal clinic may not be a barrier to care. For many FSW who are single mothers and must earn money to feed their children everyday, waiting for hours in a clinic may not be an option.

We recognize the need to locate clinics for HIV testing and treatment where they are convenient to the population that must access them and the staff treat clients with respect. The same approach is needed for clinics for FSW where they can receive reproductive health care, antenatal care, support during labor and delivery, postpartum care, and well- and sick-child care.

The need for clinics to care for the children of FSW was underscored by visits to HIV testing centers in a country in Africa during 2019. While asked about the care of the children of the FSW who received HIV testing in the clinic, the staff reported that the mothers often ask the staff for care for their children. The funding for this clinic, we learned was limited to HIV testing and treatment for adult FSW, not for their children. So the staff have to tell the mothers with sick children to take the children to another clinic but, they report, most mothers cannot afford to take the children to another clinic so just go to a local pharmacy to have the children diagnosed and treated.

## CONCLUSION

Female sex workers, especially those who are pregnant, and their children, are among the most marginalized populations in the world. They are marginalized by donors, funders, and service providers. The funding and service priority is on HIV for FSW and there is virtually no funding to research for the unmet needs of pregnant FSW or their children, or funding to provide prenatal care to pregnant FSW in a targeted fashion, as there is with HIV prevention and treatment.

Societies, researchers, and funders focus on FSW only as sex workers. This must change. We must recognize that there are millions of mothers and mothers-to-be who support themselves and their children through selling sex. These mothers know that they are mothers: the world needs to know that too.

We propose that the health of FSW and their children must be viewed in a family-centered context. Rather than viewing FSW primarily from an HIV perspective, we must recognize FSW as mothers with maternal health needs, and that their children need care too. We need to provide comprehensive health to these families.

FSW and their children are families. They are further marginalized when the focus of funders and government is only HIV among FSW, ignoring other aspects of these women's lives, including pregnancy, childbirth, breastfeeding, childcare, and the education of their children. To truly help mothers who support their children through sex work and their children, we need to address their situations through a family-centric perspective and listen to these mothers about the needs of their families.

The need to address the unmet needs of these families has never been greater. The COVID-19 pandemic will result in more food insecurity for FSW and their children, leading to many FSW to engage in high risk behavior in order to secure food for their children. The stress of the pandemic will likely also increase depression among many FSW, including those who are pregnant and have recently given birth. During a study we conducted in eight countries during 2019, there were many reports of FSW who committed suicide, including during pregnancy and in the postpartum period. We must act quickly to protect these families not only from the direct impact of the novel coronavirus, but also from the indirect impacts of the pandemic.

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# Inescapable

*Each month, womxn and girls in countries all over the globe are faced with a dearth of sanitary products, infrastructure, and support to manage their recurring menstrual cycles. The consequences are not under their control - inescapable and turbulent - though they often must learn to manage on their own, like a strong sailor in a storm.*

*Art by Rachel Toutant*

# Global Health in Our Backyard

A SPOTLIGHT ON CRITICAL HEALTH CHALLENGES IN CANADA WITH FOCUS ON VULNERABLE AND UNDERSERVED POPULATIONS AND ENVIRONMENTAL THREATS.

Photo Courtesy of Melissa Leak

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RESEARCH ARTICLE

# Evaluating Implementation Factors of Indigenous Communities in Northern Ontario for eConsult

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## ABSTRACT

The creation of innovative platforms is of limited benefit if not implemented properly with careful consideration of regional contexts. Digital health platforms can be a tool that may improve access to quality care for residents of Northern Ontario. The health innovations framework of Chaudoir et al. [1] was used to address patient, provider, organization, and system level factors relevant to the implementation of electronic consultation (eConsult) in the North West Local Health Integration Network (LHIN) for Indigenous communities. An environmental scan was conducted through a systematic literature search of three databases and grey literature. For the implementation of eConsult in Indigenous communities in Northern Ontario, it was recommended that: (1) an Indigenous care expert should be consulted to include features that ensure the provision of culturally competent care to patients; (2) further investigation into the role of nurses and nurse practitioners in Indigenous communities should be conducted; (3) the possibility of partnering with provincial Aboriginal Health Access Centres and the Northern Ontario School of Medicine should be explored; (4) the gain of federal government funding and support; and (5) the function of eConsult should potentially extend to act as a centralized source of public health information. Extreme regional diversity is prevalent across Northern Ontario, and additional analyses should be done at a more local level prior to the implementation of eConsult.

## INTRODUCTION

Complex sub-regional differences exist in Northern Ontario, including the proportion of urban, rural, Indigenous, and Francophone populations [2-7]. These differences result in unique health access challenges [7]. If properly implemented, digital health platforms are a tool that may improve access to quality care for residents of Northern Ontario. Electronic consultation (eConsult) is a web-based platform that facilitates communication between primary health care providers (HCPs) and specialists. The platform provides primary care providers quick access to specialist consultation and referrals, can improve patient quality of care, and mitigates unnecessary specialist appointments [8]. Formally known as the Champlain Building Access to Specialist Care through eConsult (BASE) Project, eConsult was initiated in 2009 by Dr. Clare Liddy and Dr. Erin Keely in the Champlain Local Health Integration Network (LHIN) in Southern Ontario [8]. Results from over a decade of use in this region indicate that eConsult can reduce specialist wait times, improve timely access to care, enable physician learning, and facilitate continuity of care [8]. The success of eConsult spurred the provincial government to invest in expanding the service across Ontario. This paper evaluates patient, provider, organizational, and systems level factors as informed by the Chaudoir et al. [1] framework for innovation implementation.

## METHODOLOGY

A passive environmental scan was conducted using three databases and a grey literature search [9]. Analysis of included literature was informed by the five-factor framework of Chaudoir et al. [1], including patient, provider, organizational, structural, and innovation level components of the implementation setting. Innovation level components were excluded from this analysis because it required the comparison of existing operations of a single organization to eConsult and was not within the scope of this environmental scan.

Databases searched included MEDLINE, EMBASE, and Ovid Health Star. A keyword search was applied. Studies included were focused on locations within the North West LHIN or the North East LHIN, published in 2009 or later, and contained two or more Chaudoir et al. [1] framework factors relevant to health innovation implementation. The initial search yielded 206 articles, 35 met the inclusion criteria. The grey literature search included a search of the Ontario Government, Ontario Ministry of Health and Long-Term Care, Government of Canada, and Northeast and Northwest LHIN Healthline websites.

## RESULTS AND DISCUSSION

**Patient level factors** impacting innovation implementation for Indigenous communities in Northern Ontario included historical factors, potential mistrust of HCPs, cultural and spiritual beliefs, and polarized attitudes towards web-based care in communities. Centuries of discriminatory policies, forced relocations, residential schools, and forced sterilizations have created severe health inequities [7], leaving communities with long-lasting and intergenerational trauma [10,11]. Yet these effects vary drastically across communities. Some Indigenous people have a distrust for health professionals, which is reinforced by racism prevalent in some health care institutions in Northern Ontario [12].

Cultural and spiritual beliefs must be considered when delivering quality care [13], such as the belief that wellness is comprised of the connections between people, communities, generations, and the land. Providing culturally competent care to Indigenous patients is essential and should be considered in eConsult implementation [6,9,10].

Lastly, communities may have negative attitudes towards web-based initiatives as they may be perceived as detracting from the community's own capacity building and physical or staff resourcing. Moreover, there are issues with technology and internet access, privacy concerns, and some prefer to leave the community to receive care [16]. Patient level factors highlight that it is crucial to listen to Indigenous community members' needs and values, involving them in the implementation process.

It is recommended that an Indigenous care expert be consulted to determine how eConsult can facilitate the delivery of culturally competent care.

**Provider level factors** concern the attitudes, beliefs, and perceived level of autonomy of HCPs who will implement the innovation in their practice. For Indigenous communities, there are typically three types of HCPs: nurses, physicians, and nurse practitioners [7]. It is crucial to evaluate the role of each patient-facing provider in order to determine how eConsult may be the most beneficial and potentially facilitate continuity of care. **Physician factors** found to positively impact implementation include being able to provide culturally competent care, establishing positive patient relationships, and communicating effectively with patients [12-14]. **Nurse practitioners** play a key role in multiple care settings, such as at Aboriginal Health Access Centres (AHACs) [2,15]. However, minimal sources regarding provider factors of nurse practitioners in Northern Ontario were obtained in this environmental scan. **Community health nurses** work in expanded roles and can be responsible for providing acute, emergency, routine, and preventative care, in addition to coordinating on-site and off-site team interventions [21]. Some nurses at remote stations reported feeling ill-equipped to effectively treat patients because they lacked access to further training [22].

For provider level factors, it is recommended that further analysis be conducted into the roles of community nurses and nurse practitioners in how they facilitate the chain of care within Indigenous communities. eConsult may be a viable platform that can fill in gaps in communication and continuity of care.

**Organizational level factors** include constructs relevant to the organizational environment where the innovation will be implemented. Indigenous patients encounter multiple organizations on their care journey, including community Band Offices, AHACs, and small and large hospitals. Band offices are federally funded organizations located on reserves, offering local primary care for residents from a registered nurse or nurse practitioner. Locum physicians may make visits to the office and are provincially funded. Provincially funded AHACs are usually located near a northern urban centre. They provide culturally competent care to Indigenous patients who live both on and off reserves and have existing electronic medical record infrastructure [23]. Depending on where patients are located, secondary care may be accessed at small hospitals that are linked with medium to large hospitals through network clusters that comprise the multi-specialty physician network [24]. Large hospitals may support smaller isolated hospitals by means of a satellite network. When considering the continuity of care between organizations, patients from non-isolated Indigenous communities have more concerns about access to post-clinical services than isolated communities, due to the lack of clarity in where follow-up should be sought [22]. Factors relevant to eConsult implementation, including fragmented funding, discontinuous organizational structure, high staff turnover, and absences of reliable patient transportation services, make coordinated care extremely difficult for Indigenous patients [2,11,17-20].

At an organizational level, it is recommended to investigate partnering with AHACs to implement eConsult due to their provincial funding and existing capacity for providing culturally competent care.

**Structural level factors** include social, political, and economic considerations. For Indigenous patients, primary care is typically federally funded, whereas secondary care is provincially funded [7]. This economic dichotomy creates complexity and deficits in service provision while neglecting some services entirely [9,23,24]. Politically, there is a trichotomy (federal, provincial, local) that governs health care provision, leading to fragmented sources of information. This was apparent by the local confusion and contradiction during the 2009 H1N1 influenza pandemic [28]. Lastly, Indigenous communities suffer from human resource shortages of trained health care professionals [28]. Factors influencing implementation of eConsult include economic and political fragmentation of both funding sources and governance, a deficit of policies mandating culturally competent care, and shortages of human health resources.

From a structural perspective, it is recommended to consider extending the function of eConsult to serve as an integrated health information source to provide consistent health information to solve the issue of contradictory health information from regional, provincial, and national authorities.

| Factor | Recommendation |
|---|---|
| *Patient* | Engage Indigenous care experts to determine how eConsult can facilitate delivery of culturally competent care. |
| *Provider* | Conduct further analysis into the roles of community nurses and nurse practitioners in how they facilitate the chain of care within Indigenous communities |
| *Organization* | Investigate partnering with AHACs to implement eConsult |
| *Structural* | Consider extending the function of eConsult to serve as a unified health information source |

**Figure 1.** Five recommendations for the implementation of eConsult in Northern Ontario informed by analyses of the patient, provider, organizational, and structural level factors.

## CONCLUSION

Analyses of the patient, provider, organizational, and structural level factors were used to make five recommendations for the implementation of eConsult in Northern Ontario (see Figure 1). Significant regional differences exist for each community. Northern Ontario presents a broad, fragmented, and complex implementation landscape that has many challenges, and it is recommended to invest in understanding local contexts when implementing eConsult.

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OPINION EDITORIAL

# Public Health Issues Facing Canada: A Spotlight on Ontario

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## INTRODUCTION

The mental health crisis, opioid epidemic, and burgeoning household food insecurity are all three key and related challenges that will significantly challenge the state of public health in Canada over the next decade. This paper uses Ontario as a spotlight to investigate how these challenges have manifested, and will present plausible solutions and strategies to address the intersection of these challenges.

## MENTAL HEALTH

Each year, mental health and addictions affect 1 in 5 Canadians [1]. By the age of 40, 1 in 2 Canadians will have experienced a mental health condition [1]. In Ontario, the mental health epidemic is systemic and can be traced back to governmental policies created during the late 1980s regarding social housing, social welfare, and homelessness [2]. Though social housing was initially under federal jurisdiction, in the 1990s it was transferred to the provincial governments then further transferred to individual municipalities after 1995 [2]. At the same time, the provincial mental health care system was subjected to a drastic process of restructuring and deinstitutionalization and saw a transition towards community-based mental health care [2]. This move saw patients within the mental health institutions moved to facilities/ services that did not have the adequate funding and resources [2]. Altogether, this changeover to community-care and the province's transfer of responsibilities and cancellation of pre-existing affordable housing developments, forced large groups of psychiatric survivors into states of homelessness. The literature shows that stable and affordable housing is a crucial part of an individual's recovery as it provides the stability needed to pursue education, employment, or other activities [1,2]. The lack of affordable and stable housing for recovering individuals may have exacerbated the mental health burden on an already vulnerable population.

The mental health burden has major implications for the healthcare system, with years of life lost due to premature mortality estimated to be 1.5 times more than that of cancers and "more than seven times that of all infectious diseases" [3]. Despite the significant mental health burden on the Ontario healthcare system, the provincial government announced in 2018 that there would be major cuts to the mental health budget [4]. This announcement was met with public outrage as in fact more and not less funding is needed to address the burden of mental illness in the province [4].

## OPIOID CRISIS

Substance abuse, specifically the opioid crisis, is of increasing national public health concern. From January 2016 and June 2019, more than 13,900 opioid-related deaths occurred nationally [6]. Moreover, as of early 2019, fentanyl and fentanyl analogues accounted for 80% of all opioid-related deaths [6].

Ontario is one of the epicentres of the opioid epidemic in Canada. In 2017, more than 1,250 Ontarians died from opioid-related causes [7]. This represents an increase of 246% from 2003 [7]. Autopsies revealed that of all the opioid types present at death in 2017, fentanyl accounted for over 60% [7].

The origins of the opioid crisis can be traced back to governmental policies made during the 1990s. In 1996, Health Canada approved "OxyContin", a version of oxycodone produced by Purdue Pharmaceuticals, to be prescribed as a pain-reliever [8]. Between 1999 and 2003, the number of OxyContin-related deaths steadily increased as it was an easily accessible drug for unprescribed consumption. Due to increase in OxyContin-related deaths, Purdue decided to replaced OxyContin with OxyNEO in 2012 to reduce the ease of ingestion, but provincial drug-plans stopped paying for both drugs that year [8].

The resulting decrease in OxyContin and OxyNEO supply, resulted in prescriptions for alternative painkillers such as fentanyl [8]. With the cost and accessibility of fentanyl being lower than heroin, opioid and heroin users began turning towards this more potent form [9]. The emergence of more potent opioids, such as carfentanil, in illegal markets highlight the escalation of the crisis in Canada [9].

Currently, naloxone is the only "opioid antagonist" available, that can counter effects of opioid overdoses however there is an insufficient quantity due to limited funding available for harm reduction policies [9,10].

## HOUSEHOLD FOOD INSECURITY

In 2008, over 12% of Canadian households experienced food insecurity, with an additional 450,000 households being affected by 2011 [11]. Proper nutrition is a prerequisite to good health, essential for proper growth and development, and a significant factor in preventing many chronic diseases including cancer, heart disease, and diabetes [11]. Income is one of the main barriers to accessing sufficient nutritious food, which is now being recognized as a risk factor for poor health.

Of note, renters make up two-thirds of the food-insecure households in Canada. 1 in 4 households that rent their accommodations are food-insecure [12]. Owning a home is a protective factor during food insecurity emergencies as it facilitates the availability of funds to address job loss or sudden illness [12].

Ontario has the highest number of severely food insecure households compared to all other provinces and territories [12]. In Ontario, 64% of Ontarians who rely on social welfare were also food insecure [12]. There is evidence that food insecure low income households can be aided through public policies like Canada's pension plans or the Universal Child Care Benefit (UCCB) via direct financial aid [12].

## RECOMMENDATIONS.

Upstream approaches to addressing the mental health crisis are critical, and there are already some promising policy directives being put into effect to do this. An example of this is the 2018 National Housing Strategy, which approaches the housing crisis with a systemic lens by involving all levels of government and partners from various sectors, to aid those in greatest housing need while maintaining the creation and implementation of policy related to housing [13]. From a provincial perspective, there should be continued funding for the Investment in Affordable Housing (IAH) program that is scheduled to end March 31, 2020. The program currently allows the Ministry of Ontario to operate with Local Health Integration Networks, community care access centres, and local mental health services to integrate affordable housing [14]. The dismantling of this program without a proper contingency plan may result in the policy gap environment that contributed to negative health outcomes discussed.

For the opioid crisis, one recommended policy strategy is the reinforcement of evidence-based harm reduction policies such as the use of supervised consumption sites (SCS) and needle exchange services [10,15]. Additionally, a cost-effective strategy is providing naloxone kits for individuals working with or in proximity with those at risk of opioid overdose [9]. Although, the aim of SCS are to treat overdoses preemptively, whereas naloxone kits prevent real time overdoses, both address the opioid crisis by improving public health outcomes while accounting for the rights of vulnerable populations.

Finally, with regards to tackling Ontario food insecurity, the first line of action recommended is increased surveillance. The Government of Ontario opted out of participating in the Canadian Community Health Survey, a nationwide annual survey looking at households with food insecurity, for 2015 and 2016 [16]. Without sufficient data, the issue of food security cannot be fully understood, hindering the implementation of evidence-based policies. Ontario should opt back into the next available Canadian Community Health Survey as an initial step towards addressing this topic. This decision would provide a measure of the problem, which would enable program and policy experts to plan and implement action accordingly [17].

## CONCLUSION

The burden of mental illness, the opioid crisis and food insecurity on Ontario's healthcare system mandate coordinated and decisive action and policy change [3]. To tackle these issues, upstream and evidence-based interventions such as support for affordable housing care, harm reduction measures, and population surveillance are needed. Unchecked, these three challenges will greatly intensify the societal burdens and increase healthcare costs. This paper brings awareness to these areas and proposes recommendations with the ultimate goal of improving the health and well-being of all Canadians.

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OPINION EDITORIAL

# Striving Towards Symbiosis: Addressing Sustainability of Global Health Placements

**Noa Lashevsky**, McMaster University

## INTRODUCTION

In an ever-globalizing world, there is an increasing need for global health (GH) research and development efforts that aim to address social and health inequities locally and globally [1]. Students engaging in GH placements can offer great prospects to the field; however, the lack of sustainability of such placements is frequently debated [2,3].

For my undergraduate thesis, my research partner and I developed a six-week theatre program for Indigenous youth in Hamilton, Ontario. The objective was to foster a supportive space for youth to explore their powerful, yet often silenced, voices using creative theatre games. With every session, the reciprocity of trust grew as the youth confided in me and I in them. They shared their stories of resilience, intergenerational trauma, how various social systems – such as schools, families, and shelters – continue to fail them, and how this very community centre we visited had become their safe haven.

By the end of the six weeks, the openness and engagement of the youth, alongside their sentimental farewell ceremony, reflected the success of the program. In fact, the youth requested for us to visit soon. Unfortunately, as commonly seen in student placements, this never happened – for one reason or another, I never returned to the centre. This observation led me to question: how can we address the lack of sustainability in short-term GH placements (GHPs)?

In this opinion piece, I will briefly delve into the current state of sustainability in GHPs and consider how to enhance the symbiotic partnerships they set out to achieve.

## THE ISSUE AT HAND

It is well-documented that GHPs enhance the outcomes that organizations could achieve on their own [2,3]. Some benefits include: generating awareness and funding, driving smarter policy development, and expanding stakeholder engagement [2-4]. Sustainability of GHPs, on the other hand, has been heavily contended in the literature [3-6]. Although various guidelines for sustainability have been developed, contextual factors can hinder their effectiveness and/or implementation [7]. Continuous advancement of neo-colonial agendas, alongside deeply embedded institutional and economic hierarchies, may prevent the truly sustainable partnerships proposed by such guidelines while further disempowering already marginalized communities [7].

For example, a protocol incorporated by many GH programs is the “pre-departure” form, where students outline their objectives, resources to be used, plan for demonstrating their learning, and projected target dates to complete the above-mentioned tasks [8]. While these outlines help students visualize their goals, they may “perpetuate an overly simplified view of global development” [9]. These objectives are often determined with little to no consultation from host communities, leading to activities that do not meet locally identified needs [3,10]. In fact, the mere nature of pre-departure forms can be controversial if they are not fluid nor adaptable to the host community throughout the duration of the placement. Students may risk developing "culturally incongruent programming" and creating "parallel systems that disrupt established local services and redirect scarce local resources, which fosters dependency instead of building capacity" [10].

## CONSIDERATIONS

In order to develop symbiotic partnerships and align objectives, students should accustom themselves to their host community to better understand their culture, environment, and physical and socio-political infrastructure. As a result, students would be better able to address the host population's needs, which would then inform and shape their learning objectives. As suggested by Ouma and Dimaras [9], "a disorderly or 'chaotic' approach to acquiring impactful change, coupled with a focus on building solid human relationships, rather than following a set of rigid goals or tasks" is fundamental when striving to develop and maintain truly sustainable partnerships [9]. The authors highlight that flexibility is necessary to "avoid being locked into goals that may be artificial" so that students and local hosts can "create something of value that is mutually beneficial" [9].

In order to integrate fluidity, I propose that we turn rigid checklists into open-ended questions that would be discussed amongst collaborating parties, as well as explored individually by participants through reflections before, during, and after the termination of the placement. These questions could include:

1. Who are you and with whom are you working?
2. What are your/ their skills and objectives?
3. What are the barriers to meeting the proposed outcomes? What could be done to mitigate and overcome these barriers?
4. How can you engage with the host community to optimize your presence and mitigate the potential harm of your absence once you complete the placement?
5. What measures can be taken to facilitate and integrate continuous feedback between you and the community?

The last question listed is perhaps the most fundamental to my proposal. Engstrom and Jones [11] highlight how an iterative feedback process is necessary in order to address unexpected events and developments that are inevitable in any work environment [11]. In other words, in order to successfully adapt and shift the trajectory of practicums to align with the changing needs and skills of both both parties, ongoing communication about shared objectives is imperative [12].

## CONCLUSION

In the case of my thesis, my partner and I funnelled considerable time and resources into developing an innovative, yet temporary, program. Had we taken the time to learn more about the community's objectives and needs, we could have worked to bolster its existing drama programs, which would continue to run even after our departure. As critiqued in the literature and exemplified through my experience, the limited time spent by volunteers in host communities can generate unsustainable outcomes and potentially strain overstressed organizations [9,13]. Although countless sustainability protocols for GHPs have been developed to mitigate this issue, certain limitations may compromise their effectiveness. The crux of this paper however, is not to suggest we forego existing protocols or GH work as a whole. In fact, this work is essential in narrowing the gap of health inequities locally and globally. Rather, I hope to challenge and prompt further dialogue on *how* we employ such frameworks. By incorporating reflexivity and flexibility into our practice, we can begin to unravel and thus address the deeper challenges to forming truly symbiotic GH partnerships.

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OPINION EDITORIAL

# An Innovative Approach to Improve Canada's Infectious Disease Pandemic Rapid Response in Marginalized Communities

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## INTRODUCTION

It appears that the occurrences of infectious disease pandemics are increasing globally. Developed countries like Canada, despite their medical advancements, are not immune or sufficiently prepared to prevent and control future pandemics. Studies demonstrate that infectious disease pandemics often begin in one country and spread to others through increased human movement during international travels [1]. For instance, the 2013-2016 Ebola Virus Disease pandemic began in Guinea and later spread to other countries within and beyond West Africa through transnational travel. Similarly, the 2003 Severe Acute Respiratory Syndrome (SARS) outbreak, began in China and spread to several other countries, including Canada [2].

Following the SARS outbreak, the Canadian government established the Public Health Agency of Canada (PHAC) to improve Canada's nationwide infectious disease preparedness [2]. The establishment of PHAC, along with several other measures, appears to have positively impacted Canada's overall infectious disease preparedness, demonstrated by a recently published 2019 Global Health Security Index report. The index rated Canada as one of the 'most prepared' countries for detecting and responding to an infectious disease pandemic, ranking fifth among the 195 included countries [3].

However, due to the fragmented structure of Canada's healthcare system, rapid response performance remains suboptimal in marginalized communities [4]. Canada's lack of sufficient protocols for rapid response in marginalized communities, where there is a dire need, limits Canada's overall infectious disease pandemic preparedness [3]. Infectious disease reporting times in remote marginalized communities are inferior to reporting times in urban communities [5].

Additionally, the retention of healthcare workers in rural communities compounds Canada's rapid response capabilities, as many physicians only work in these regions on a temporary basis. These concerns, if not addressed, have the potential to impair nationwide infectious disease response in the case of a future global pandemic. Therefore, this paper contributes to the discourse on how Canada can improve its infectious disease rapid response measures by strengthening healthcare workforce retention. This will enable Canada to improve its response to future infectious disease pandemics in marginalized communities.

## EMERGENCY PREPAREDNESS

Emergency preparedness and response planning exists “as two phases within a broader cycle of health emergency management” [6]. Preparedness includes effective infectious disease surveillance to detect any public health event of global health significance, followed by a response phase to control the event before it spirals out of control [6].

A major aspect of a country’s infectious disease preparedness includes a strong healthcare workforce [6,7]. In Canada, marginalized communities experience a significant amount of inequalities regarding access to several social amenities, including healthcare services, when compared to other geographical areas [8]. For instance, although the federal government is responsible for healthcare financing in First Nations and Inuit populations, the provincial government takes on the responsibility of funding care for the Métis population. As a consequence of these differences in federal and provincial funding, a lack of coordination and equal treatment exists between these communities [8]. Although PHAC was established to improve response times across Canada, responses to an outbreak in these communities have not seen a measurable improvement [5]. Moreover, Indigenous people’s poor access to essential healthcare services further complicates access to current data on health service utilization, making it more difficult to develop responsive health policies [9].

## THE UNITED STATES OF AMERICA’S APPROACH

In comparison, infectious disease preparedness of other developed countries, such as the United Kingdom and the United States (U.S.), can be attributed to their effective implementation of a nationwide public health legislation. For instance, in 2013, the U.S. government introduced the Pandemic and All-Hazards Preparedness Reauthorization Act (PAHPRA) to strengthen their national health security strategy [4]. The implementation of the PAHPRA may have contributed to the U.S.’s efficient and effective response to public health emergencies during the 2016 Zika virus outbreak. Furthermore, the Center for Disease Control (CDC) utilized a Strategic National Stockpile (SNS) of medicines and supplies to ensure nationwide access to preventative supplies for at-risk populations, such as pregnant women in the U.S. whose unborn children were susceptible to congenital microcephaly if infected with the Zika virus [5]. The SNS is a large supply of life-saving pharmaceuticals and medical supplies for public health emergencies in the U.S [10]. Additionally, the CDC provided regulatory programs centered on the safety of healthcare providers and researchers in contact with the virus, thereby creating a safe environment for healthcare workers in the event of an outbreak. These programs, created by the U.S., ensured that up-to-date guidelines were available to all responders during the outbreak, a strategy that Canada can adopt for its marginalized communities [9].

## POLICY SUGGESTIONS

Based on the narrative outlined in the previous section, this paper proposes some measures to improve healthcare worker preparedness within marginalized communities located in Canada. For one, Canada should prioritize the recruitment and retention of healthcare workers in marginalized communities, in order to address geographical disparities. An instance of this would be to adopt a strategy to retain qualified Indigenous healthcare workers within their own communities, which may be more effective than recruiting and deploying new doctors from other areas [11].

Although the federal government offers financial incentives to attract young doctors to work in these rural communities, additional incentives such as hardship allowances, can work to retain them [12]. Canada should also ensure that the recruitment of rural doctors is in collaboration with local community leaders [13]. Similarly, Canada’s provincial governments can adopt the U.S. policy of creating up-to-date guidelines in collaboration with rural communities, in order to determine suitable responses for each individual area. Collaborative policies have an advantage of making communities self-sufficient, whilst improving these communities’ infectious disease preparedness, thereby creating acceptable policies that align with their culture

[8,12]. Establishment of these policies can provide effective communication between rural communities and among all levels of the healthcare system, which will ultimately ensure an improved rapid response system across Canada [13].

## CONCLUSION

The outlined recommendations aim to mitigate the current gaps in Canada's rapid response approach within remote marginalized Indigenous communities. We conclude that Canada's rapid response to infectious diseases can significantly be improved through collaborative efforts between remote Indigenous populations and creating incentives to attract and retain healthcare workers in marginalized communities.

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**OPINION EDITORIAL**

# The 2005 Kashechewan Water Crisis as a One-Time Disaster and Ongoing Crisis

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Not all Canadians have access to safe drinking water [1]. First Nations, in particular, experience challenges related to the quality of their water supply on their land reservations [2,3]. The Kashechewan First Nation community, located in Northern Ontario where James Bay meets the Albany river, frequently experiences poor water quality [4,5]. One of the most severe incidences was during October 2005, when *Escherichia coli* (*E. coli*) was discovered in the community's drinking water [6,7]. This resulted in the worsening of pre-existing skin ailments and the evacuation of the sickest people [6,7].

News media reported on the presence of *E. coli* in the Kashechewan First Nation community's water supply, outlining how two groups of individuals made sense of the situation differently. The two groups of individuals, also known as the discourse coalitions, were: (1) government institutions; and (2) the Kashechewan First Nation and individuals representing the community. Investigating how health crises are framed by discourse coalitions is important because the framings may impact what the problem is attributed to (cause of the problem), what kind of interventions are invited, and what the interventions do not address [8]. This paper will explore how government institutions and the Kashechewan First Nation describe the Crisis, what they attribute the problem to be, what kind of intervention their framing invites and what these interventions would not address.

Government institutions, including the Ontario provincial government, the Canadian federal government, and Health Canada were quoted, cited, and referenced in media articles discussing the Crisis as a one-time disaster, an event "start[ing] [at] a moment in time" [2,4-6,9-12]. News writers often began their articles by discussing the water test performed by Health Canada. This was framed as the start of the Crisis when acknowledgement of the water issue was unavoidable [12]. Notably, one article presents both a date and time associated with Health Canada results: "[o]n the morning of October 14, 2005 ...[a]t 1:35 p.m. that day, Health Canada sent Chief Leo Friday a fax that the water was contaminated with *E. coli*" [13]. The explanation was that the contaminated water supply and aggravation of skin ailments was attributed to a lack of chlorine in the water and dysfunction of the coagulant used to remove water discolouration.

The interventions invited by this framing were to apply the coagulating agent and increase chlorine in the water to "shock levels" [4,10]. This framing also invited other interventions when the problem of skin ailments remained, even after the water was treated. For example, "[t]he federal government decided to transport about 1,100 of the 1,900 residents of the James Bay reserve to other communities" [6], and "mov[e] some residents to hospitals for treatment" [6].

Consideration was not given as to why "chronic skin conditions" [10] existed in the community. This may be because the framing describes the Crisis in relation to the water test, which occurred when community members already had skin ailments. Thus, when interventions addressed chlorine and coagulant levels in the water, government institutions focused on avoiding the further aggravation of the skin conditions, instead of investigating why the chronic conditions were occurring. As such, this framing leaves out how to address issues that have likely been accumulating over a long period, often associated with slow disaster [14].

The Kashechewan First Nation and individuals representing the community were also quoted in the same media articles [2,4-6,9-12]. However, in contrast to the government's framing of the Crisis as a one-time disaster, the Kashechewan First Nation framed the contamination as an ongoing crisis occurring over a long period of time, or "slow disaster" [14]. For example, Mike Krebs, an Indigenous rights activist remarked that the "[c]ommunity has been on a boil-water advisory from Health Canada for over 2 years, and numerous such advisories ha[d] been in place for decades" [2]. This suggests possible issues with the Kashechewan First Nation's water supply prior to October 14, 2005 when their water tested positive for *E. coli.*

Furthermore, the Kashechewan First Nation and individuals representing the community described accumulating factors that they associate with the Crisis. For example, physicians familiar with the community attribute the community's serious health problems to their "long history of overcrowding and squalor, not any recent change in water quality", which suggests "discontent with far deeper roots than [October 2005's] *E. coli* spike" [10]. Additionally, unemployment rates on the reserve as high as 87% [2] were attributed to "a legacy of an historic federal government policy isolating [I]ndigenous people on remote reserves and den[ying them] the opportunities for economic and social development" [2]. Thus, the Kashechewan First Nation attribute the problem to accumulating overcrowding, unemployment, and isolating government policy.

The first 'intervention' this discourse coalition advocated for, as highlighted in media articles, was for residents to remain on the reserve. A physician remarked that "an evacuation was not necessary on purely medical grounds" [10] and recommended that "residents continue boiling water – as they had been for years" [10]. Perhaps, the physician did not think that the evacuation intervention proposed by government institutions would address the Crisis framed as a slow disaster because an evacuation would not explicitly address overcrowding or unemployment on the reserve, nor seek to provide new opportunities lost due to government policy.

The second intervention suggested by Jonathon Solomon, who was born in Kashechewan, was to relocate the community closer to a bigger community to reduce isolation and improve access to employment and school opportunities for youth [10]. Unemployment rates, which were identified as an issue that the problem was attributed to, could decrease with this intervention. This framing failed to address the *E. coli* found in the water because of its focus on: (1) how "injury" developed; and (2) the accumulating factors, such as unemployment and overcrowding, which contribute to chronic skin ailments aggravated by contaminated water [14].

In conclusion, the 2005 Kashechewan Water Crisis was framed by government institutions as a one-time disaster with episodic quality and by the Kashechewan First Nation and individuals representing the community as a "slow disaster" [12]. Government institutions attributed the problem to a lack of chlorine and a dysfunctional coagulant, which invited an increase in chlorine levels and coagulating agent along with an evacuation of the sickest people as interventions. In contrast, the Kashechewan First Nation framed the Crisis as a slow disaster influenced by overcrowding, unemployment, and government policy, which hindered economic and social growth over several years [14]. Interventions carried out by government institutions failed to address why the chronic skin ailments existed among the Kashechewan First Nations and thus failed to address the Crisis as a "slow disaster". This is an important discussion as investigating how health crises are framed in news media challenges readers and global health practitioners alike to critically reflect on approaches to managing these situations and their underlying assumptions. Being aware of dichotomizing discourse coalitions allows for a greater understanding of how and why different interventions are proposed and implemented. The next time you encounter news media discussing a health crisis, like the 2005 Kashechewan Water Crisis, will you evaluate how it's framed?

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OPINION EDITORIAL

# A Review into the Approach of Mental Health Issues Among First-Generation Immigrants in Canada

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It is an unfortunate reality that in modern society, mental health has become a pervasive challenge, especially among immigrants [1,2]. The unique circumstances of this population necessitates that the traditional approach to mental health care needs to be altered, to accommodate socio-economic differences, cultural barriers, and general post-migratory attitudes. Socio-economic factors influence how people settle into new environments, cultural barriers can help with environmental adjustments, and a welcoming post-migratory environment contributes towards acceptance, ultimately limiting the effects of mental illnesses on immigrants and their offspring [3-5].

It is unfair to categorize all newcomers to Canada under the umbrella term of "immigrant". There are multiple categories among the people who aim to make Canada their home, and with each category comes differences in socio-economic backgrounds [4,6,7]. The social determinants of a person's status in a country plays a significant role in their mental health [3]. Factors such as income, social support, and physical environment affect health in general, but immigrants, refugees, and racially discriminated people are typically at a greater disadvantage in these aspects [4,8]. Immigrants suffer in new environments with language and comfort issues [4,7]. In particular, a study by Weiser and colleagues [9] depict immigrants as more likely to live in impoverished metropolitan communities than the native population. Consequentially, a higher risk of mood disorders are associated with those who are at a greater socio-economic disadvantage [10]. Healthcare is not standardized around the world and is varied depending on the population. The cultural influences of an individual's home country affect how they view mental illnesses and how they choose to approach them [8,11]. It is the duty of mental healthcare providers to minimize the stigmatization towards mental health and to create a culturally relevant environment where a patient can express their issues without the fear of miscommunication or judgement. The *Diagnostic and Statistical Manual of Mental Disorders* (Fifth Edition) provides basic instructions for clinically relevant considerations between a provider and their patient [5]. Although, it must be noted that the generality of the considerations set in place does not accurately represent the cultures of all Canadian immigrants, therefore potentially limiting the standard of care towards mental illnesses. The Canadian healthcare system must place a greater emphasis on the comparison between the attitude towards mental health in other countries versus our own, particularly the past experiences of the patient and doctors [7,11].

Socio-economic factors affect more than just the health of the immigrants themselves: barriers in language and culture increase the risk of misdiagnosis [12,13], and studies show that clinicians are likely to misdiagnose people based on preconceived stereotypes [10]. A study conducted in the U.S. by Flores et al. [12] revealed that interpretation errors committed by unofficial translators had a 77% chance of causing clinical consequences, as opposed to a 53% chance by professional interpreters. Most people also tend to downplay the severity of their psychosocial stressors in a clinical setting; people focus on their physical symptoms as opposed to mental symptoms [8]. This results in a greater number of misdiagnoses as the physical symptoms of most mental disorders are associated with physical ailments [8,13]. An average of 31 medical interpretation errors occur per clinical visit ranging from omission (52% of total errors) to addition (8%), but all concluding in misdiagnoses [12]. These issues could stem from a cultural displeasure towards discussing mental health, but are mostly rooted in miscommunication. In the literature, the best practice suggested is the use of professional translators in place of people who are merely proficient in the language of question [8,10]. Professionals limit disparities between the patient's message and the health care provider's interpretation [8,13]. The potential implication of third-party translators as a norm in immigrant care would better communication as the patient no longer needs to worry about external involvement. Translators interpret both cultural concepts alongside care [8]. Impartial translators also minimize the biases that nurses could impart. This is key since nurses often serve as make-shift translators, which may be useful for basic communication, but could create opportunity for bias in communication when a patient's preferences are incongruent with what the nurse believes to be best for their health [8,13]. Implications of an impartial, professional translator is a step in the positive direction towards a more competent immigrant mental health program.

Post-migratory factors and general attitude towards immigration also plays a major role in migrant health [2,5]. Bourque et al. [5] proposes that post-migratory conditions are more important than pre-migratory conditions. A major post-migratory factor is time. The initial period of migration is vital as it is the most vulnerable period for new immigrants [1,3,6]. Canada, despite having a population of around 20% immigrants [3], still severely lacks ethnic-based and culturally competent mental healthcare [10]. Literature also suggests that discrimination is a significant post-migratory factor, where it plays a direct role in the decline of mental health of immigrants [2,4,7]. The ability to establish oneself is important as well. People with refugee status are at a much higher risk for mental disease because of the uncertainty of their accommodations and their inability to immediately stabilize their situation [4,6]. Among all classes of immigrants, refugees are most likely to be placed in lacklustre communities [4,6]. In a study by Anderson et al. [4], among the general population, the rate of psychotic disorders was 55.6/100000 person-years, as opposed to 72.8/100000 person-years among refugees. The attitude of a community and the feeling of exclusion play a key role in anyone's mental health. In a meta-analysis conducted by Bourque et al. [5], almost all of the incident rate ratio data indicated a higher rate of schizophrenia and similar disorder among immigrants than among natives. The government should make a point to address post-migratory factors, and adjustment programs need to cater to the unique needs of immigrant populations.

Canadians need to note the socio-economic issues, diagnoses issues, and post-migratory factors prevalent among immigrants. These issues have frequently been cited as a hindrance to immigrants adjusting to unfamiliar environments and a barrier to their expression of mental distress [1-4]. Solutions including mental health education, translators, adjustment programs, and further research on immigrant-based care are a good start to ensure the future success of our country.

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OPINION EDITORIAL

# Care or Punishment: A Critique of the Treatment of Mentally Ill Persons in Canadian Prisons

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## INTRODUCTION

In the 18th-Century, John Howard, High Sheriff of Bedfordshire, travelled around Europe to study firsthand the conditions in prisons and made the following observation: "*The insane, when they are not kept separate, disturb and terrify other prisoners. No care is taken of them, although it is probable that by medicines, and proper regimen, some of them might be restored to their senses, and usefulness in life*" [1].

Although Howard's description of people with mental illness as "insane" and "terrifying" was harsh, he clearly saw that prisons were unsuitable for incarcerating people with mental illnesses who had broken the law. Little has changed today with regard to the situation of those living with mental illness in prisons. Each year thousands of mentally ill people are locked up, often in segregation, as punishment for crimes which they committed due to their medical condition. Rather than caring for them, we punish them. Prisons are not the place for people with mental illness; instead they should be placed in forensic psychiatric facilities, or, if possible, rehabilitated in their communities.

## MENTAL ILLNESS IN PRISONS

The World Health Organization defines mental illness as a disorder causing some combination of "abnormal thoughts, emotions, behaviour and relationships with others. Examples are schizophrenia, depression, intellectual disabilities and disorders due to drug use" [2]. High rates of mental illness among incarcerated people is an issue in correctional facilities worldwide. A 2012 review of 33 000 incarcerated people globally showed that one in seven suffered from major depression and psychotic illness [3]. A 2017 Correctional Services Canada study found that 79.9% of women in federal prisons suffer from various mental health disorders, most commonly alcohol/substance use (76%), anxiety (54.2%), and antisocial personality disorder (33.3%) [4]. One study of incarcerated youth (under 18) in British Columbia found that 79.3% of males and 93.9% of females had at least two diagnoses of mental illness [5]. Clearly, those with mental illness are over-represented in correctional facilities globally.

## CAUSES AND CONSEQUENCES OF INCARCERATION

A major cause of the over-representation of people with mental illness is the revolving door between Canadian prisons and the streets. An American systematic review of studies examining the relationship between homelessness and the criminal justice system found that people who are mentally ill experience more challenges finding work, housing, and healthcare [6]. Individuals living on the street and without work, in turn, are more likely to end up in prison [7].

Once incarcerated, the correctional system places mentally ill individuals into strict and stressful environments that leave them struggling to survive. Individuals who break facility rules may end up with extended sentences or be placed in solitary confinement. A 2002 survey estimated that 19% of mentally ill incarcerated people in state prisons in the United States had been charged with violating a facility rule, compared to only 9% in the general incarcerated population [8]. A study of state prisons in the United States, found that incarcerated people with mental illness were twice as likely as those without mental illness to have been injured in an altercation while in prison [6]. Mentally ill people whose illnesses may cause manic behavior, depressive episodes, or other symptoms incompatible with strict prison behavioral requirements often end up in segregation [9].

The story of incarceration is all too common for mentally ill individuals, who often find themselves first on the streets, then in courts, and then in prisons when they should be in treatment centers or healing in their communities. This systemic problem has severe human consequences, which will become clear in the following case studies.

## CASE STUDIES

Take the example of Soleiman Faqiri, a 30-year old man with schizophrenia who was incarcerated at the Central East Correctional Centre in Lindsay, Ontario on December 4th, 2016. On December 12th, court prosecutors ordered that he have a mental health assessment done. Before this could occur, his condition deteriorated; he smeared feces over himself and refused to eat. Instead of ordering his transfer to a hospital, prison leadership sent him to the prison's maximum-security segregation unit on December 15th. That same day, he was killed by 20-30 correctional officers who were called in when he refused to re-enter his cell [10]. A video shows the officers restraining his wrists and ankles and covering his head with a spit hood before beating him and spraying him with pepper spray. Minutes later, guards returned to his cell to find him dead [11].

Another infamous case is that of 19-year old Ashely Smith. A seriously ill young woman, Smith had been transferred to various facilities across Canada since age 15, always in solitary confinement with little opportunity to see her family [12]. Smith eventually died by suicide while on high suicide watch. Though cameras clearly show her tie a ligature around her neck, no guards entered her cell because they had been ordered by senior management to not intervene while she was still breathing [13]. A jury ruled her death a homicide, recommending that severely mentally ill women no longer be held in prisons [13]. The jury cited a lack of training of staff as a cause of her death, recommending that a case study of her death be used in all further staff mental health training [13].

## ALTERNATIVE OPTIONS FOR CARE

These lives could have been saved if these individuals had been placed in secure treatment facilities—or, if possible, had been allowed to return to their communities—instead of prisons, where staff are clearly unequipped to deal with mentally ill patients. Canada's correctional system has failed to prioritize the basic human rights of those with mental illness in its 'care' [14]. Abusive treatment by guards and lack of sensory stimulation may serve to worsen their conditions and lengthen the time it will take them to reintegrate safely into the community [15].

The alternatives to keeping a mentally ill offender in custody are: 1) treating them at a specialized secure treatment facility, or 2) treating them in the community. Secure treatment facilities, such as British Columbia's Forensic Psychiatric Facility, provide specialized psychiatric support to people found by a court to be not criminally responsible for their actions [16]. Unfortunately, only the most severely ill patients are sent to psychiatric facilities. The rest end up in prisons, where they often face any number of the challenges described above. Alternatively, mentally ill offenders could be sentenced to probationary periods in their home communities. One such program, the Community Mental Health Initiative, assigns mental health specialists to monitor mentally ill individuals released from correctional facilities, while providing specialized mental health training to half-way house staff and parole officers [17]. Although this program was designed to reintegrate patients after their imprisonment, it could potentially be used as a means for preventing mentally ill people from entering prison in the first place.

## FINANCIAL COSTS

Canada's over-reliance on incarceration as opposed to rehabilitation is not only unjust, but also financially inefficient because the government must pay for those with mental illness to be institutionalized long-term. The government spends, on average, $114 587 per year for each person in custody (and more than $463 045 per year for a person in segregation), while the government spends only $31 000 per person rehabilitating in the community [18]. Instead of allocating funds to pay for lifetime suicide watch (e.g., surveillance, extra security personnel), they could be used for rehabilitative resources such as home-based psychiatric care and specialized halfway homes which would help treat mentally ill offenders in their communities. For those who must remain institutionalized, the Canadian government needs to provide funding to expand prisons and better train staff to accommodate severely mentally ill people [11].

## CONCLUSIONS

It is morally incumbent on The Correctional Service of Canada to take radical steps to improve the treatment of mentally ill people in the criminal justice system. Mental illness is a medical problem, not a problem of bad judgment. Punishment merely prolongs the endless cycle of violence that sustains the penal industry at the expense of individuals' well-being. The current system sets up severely mentally ill people for failure by placing them in highly stressful and often isolated environments, worsening their conditions, and lengthening their time in high-security environments. Financially, the system is inefficient, as it pours millions of dollars into security and observation, which worsens the situation and makes even more security 'necessary'. It disposes of people, punishing them for actions which are often symptoms of illnesses out of their control. Whichever way you look at it, we must change the system so that there are no more Soleiman Faqiris or Ashley Smiths. Every life is important, and every life deserves a chance at healing.

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OPINION EDITORIAL

# Offshore Development Contamination in Canada's Arctic: A Threat to Food Quality and Safety?

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## INTRODUCTION

Due to the warming of the Arctic and ensuing ice melt, the accessibility of oil and gas reserves on the continental shelf has increased. These undeveloped reserves have one of the world's largest quantities of oil and, though a moratorium currently exists on offshore oil drilling in the Canadian Arctic, it seems inevitable that oil drilling projects will expand in the future [1]. There are many risks associated with offshore oil drilling, and Arctic communities will bear the brunt of these risks.

For thousands of years, the harvest, sharing, and consumption of country foods (also known as traditional foods) have had important nutritional, health, psychosocial, and cultural benefits [2-5]. Over the last several decades, the Indigenous peoples of Northern Canada have experienced rapid socioeconomic and environmental changes that have resulted in a significant nutrition transition. The nutrition transition is characterized by increased consumption of high energy, low-nutrient market foods and a decrease in nutrient-dense country food [2]. Notwithstanding, country foods remain a vital food source, and a diet consisting of these foods results in better health outcomes.

As 62% of Inuit are food insecure, further change in the access or quality of marine country food resources (such as beluga or ringed seal) may exacerbate food insecurity in the Arctic [6]. Furthermore, the altered accessibility and quality of these country foods may result in increased consumption of nutritionally inadequate market foods, thus increasing susceptibility to the double burden of malnutrition, where individuals consume too many calories but inadequate nutrients [1,6]. Currently, a gap in knowledge exists in the explicit evaluation of the environmental and health impacts of oil and gas development [7]. Moreover, few studies have investigated the possible health and food security impacts on coastal Indigenous peoples who rely on marine resources to survive. Therefore, this paper conceptualizes the possible effects of polycyclic aromatic hydrocarbon and oil spill contamination on marine country food quality and safety, with the aim of sparking dialogue about the possible environmental-human health risks that development poses to Arctic coastal Indigenous communities.

## POLYCYCLIC AROMATIC HYDROCARBONS (PAHS)

Contamination of the marine environment is a large concern when considering the impact of oil development on the safety and quality of country food. In the exploration phase, drilling can pollute the marine environment through drill cuttings and accidental blowouts (by-products of exploration) [8]. Heavy metals, naturally occurring radioactive materials, and hydrocarbons may be released in the local and regional environment throughout this phase. In the production phase, well-drilling, well-production, and operational wastes further pollute the local and regional marine environment through produced water (which can contain heavy metals, hydrocarbons, high levels of salt, organic and inorganic material), drilling fluids, cuttings, and hydrocarbons. Drilling fluids and drill cuttings have the capacity to be stored in sediments, making them highly available for bottom-feeding benthic communities [8,9].

Contaminants are of particular concern to humans, due to carcinogenic effects, are PAHs [9-14]. High contamination of PAHs in blood and tissue samples has been documented in various fish species exposed to petroleum development [11-15]. The bioaccumulation of hydrocarbons present in organs and consumable tissue poses a serious risk to the food web. Bioaccumulation of PAHs is not only limited to fish but can also be seen in large marine mammals with high metabolisms. Indeed, PAHs have been measured in the blood of orcas after consuming fish contaminated by PAHs [16] and in the tissue and blubber of belugas, a key source of country food [17,18]. It can be deduced that exposure to PAH through water and food significantly increases the risk of cancer to individuals living in close proximity to oil and gas development projects.

## OIL SPILLS

Oil spills are additional environmental contamination risks that have been shown to have detrimental impacts on the marine ecosystem through the release of large quantities of hydrocarbons, heavy metals, and bacteria. After the 2006 Jiyeh Oil Spill in Lebanon, a high bacterial contamination rate was found in oysters that are consumed raw by humans globally [19]. A decade after the Gulf War Oil Spill in 1991, high concentrations of zinc and copper, which were largely associated with the spill, were found in the muscle tissues of crabs [20]. In Spain, following the 1992 Aegean Sea Oil Spill, acute hydrocarbon contamination was recorded in salmon and turbot species of fish [21]. Finally, seven years after the 1989 Exxon Valdez Oil spill, otters continued to show evidence of hematological changes due to oiling [22]. Evidently, oil spills contaminate key food species acutely and chronically. In a subsistence-based community, the impact of environmental contamination due to an oil spill could considerably affect the accessibility and quality of marine country food, and therefore, Arctic food security.

## CONCLUSION

The drivers of food quality and safety in the Arctic are complex, and food contamination can occur through many pathways. This article focuses on the potential impacts of oil and gas development on the quality of Arctic marine country food. Specifically, it theorizes the conceivable impacts of PAHs and oil spill contamination on marine country food. Given the considerable importance of country food to the livelihood and well-being of Arctic Indigenous communities, research should aim to address the possible stresses that offshore drilling development may have on food security and food systems before any exploration begins.

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OPINION EDITORIAL

# Decriminalization of Drugs as a Harm Reduction Approach in Canada?

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## INTRODUCTION

Ten lives are lost every day in Canada from opioid-related causes of death [1]. 94% of opioid-related deaths in 2018 were accidental and preventable [2]. Worldwide, opioid-related deaths account for most drug-related deaths with 27 million people suffering from opioid addiction and dependency (OAD) [3,4]. Of particular concern with OAD is fentanyl, a synthetic opioid that is 50 to 100 times more potent than morphine and was first detected in the Canadian illicit drug market in 2013 [5]. This Opinion Editorial will suggest that current drug policies criminalize individuals living with addiction and forces Canadians with OAD to turn to illicit sources. By decriminalizing drugs, criminal penalties associated with drug use and possession would be eliminated [6]. From a harm-reduction (HR) lens, decriminalization rejects forceful, punitive, abstinence-based approaches to drug use and rehabilitation [6].

This paper offers a brief history of the "War on Drugs" that emerged in the United States of America and Canada in the 1970s to 1980s, compares the social and economic implications of drug criminalization versus HR policies, and provides a case study of Portugal.

## HARM-REDUCTION (HR)

In Canada there is a shortfall in current harm reduction approaches and methods regarding treatment and care for individuals with substance use disorders (SUDs) [7].

HR is an effective evidence-based, client-centred approach to helping individuals suffering from addictions and SUDs by reducing associated health and social-harms [8]. HR does not require an individual to stop using a drug in order to receive care therefore, the practice fundamentally rejects criminalization. HR policies and interventions include safe-injection sites, free naloxone kits, needle exchange programs, and opioid replacement therapy. These approaches incorporate evidence-based social theories, such as social conflict theory, emphasize human rights, and are evidence-based [9].

Other efforts in HR focus on using heroin-assisted treatments (HATs) as an alternative solution for individuals who do not respond well to standard OAD treatments or therapies, such as oral methadone. HAT provides synthetic, injectable heroin, eliminating the risk of opioids laced with fentanyl as found in illicit drug markets [10,11]. Presently, Canada shows sizeable provincial variation in implementing HR policies, with some jurisdictions implementing limited or zero policies [12]. As SUD is a national concern, HR policies should be considered on the federal level.

## HISTORY

The initial "War on Drugs" (WOD) was declared by US President, Richard Nixon, in 1971 when prison sentences were uncompromisingly increased for individuals charged with drug possession [13]. The WOD in Canada followed the footsteps of the US. Extensive economic resources, personnel, and the development of prisons were used to combat illicit drug use, all of which failed to produce the desired outcomes [14]. The WOD effects were paralleled in Canada when then Prime Minister Brian Mulroney declared a national drug strategy in the 1980s with stricter criminal legislation including the ban of drug paraphernalia sales and strengthening police enforcement to tackle illicit drug use [15]. Yet, despite governments spending trillions of dollars to enforce the criminalization of drug possession, the global illicit drug market capital is an estimated US$652 billion annually [16].

## IMPLICATIONS OF DRUG CRIMINALIZATION

Since the 1970's, Canada's drug policies have remained focused on the criminalization of drugs, despite the mounting evidence of this approach being ineffective in reducing crime and drug use [17]. Approaching drug policies from a criminal-law perspective increases the level of social and economic harm done to individuals with a SUD while doing little to address the supply and demand of drugs [18]. Each year, there is an estimated CAD $11.1 billion cost to the overall healthcare system due to SUDs [19]. Considering the present opioid problem, the opportunity is ripe for the Canadian Government to take action to decriminalize illicit opioid use, shifting the focus toward addressing core issues related to SUDs and addictions such as access to health and social services, homelessness, and social support [20].

The criminalization of illicit substances in Canada has led to adverse health outcomes, forcing users to turn to the unregulated illegal market where opioids like fentanyl and heroin are sold, causing significant repercussions to health, safety and well-being of users and the public. Unregulated heroin laced with fentanyl is a high potency drug that has caused preventable overdoses throughout the country [16].

During the prohibition eras of alcohol and marijuana, the Canadian Government learned that the social, economic, health, and criminal harms outweighed the benefits of such bans, resulting in decriminalization of alcohol in the 1920's and cannabis in 2018 [16]. Criminalization of drugs not only facilitates stigmatization of individuals who have an addiction, but also disproportionately targets marginalized and vulnerable populations such as ethnic minorities and people of lower socioeconomic status [20].

Some positive change may be underway. In a bid to tackle the opioid problem, Health Canada created "End the Stigma" campaign in 2019, which aims to decrease stigmatization towards individuals living with OAD by encouraging viewers to learn more about OAD [21]. Decreasing stigma is a necessary component for increasing support of public health interventions with a recovery-oriented approach like HR.

## HARM-REDUCTION INTERVENTIONS: CANADA

HR approaches are particularly useful for reducing fatal overdoses and providing a scaffold to access other services [22]. Canada's first supervised injection facility (SIF), Insite, was opened in September 2003 after a Vancouver-based NGO, Portland Hotel Society, built a discrete facility using a vacant looking building to limit public resistance [23]. Upon evaluation of Insite, results showed it had reduced public drug use by injection, publicly discarded syringes, and injection-related litter [24]. From 1996 to 2011, syringe sharing fell from 39.6% to 1.7% due to the increased distribution of sterile paraphernalia, which reduced the spread of infectious diseases [25]. Insite was cost-effective, with the associated savings from the SIF exceeding the cost of facility operations [26]. Insite was found to provide a societal benefit of roughly CAD$6 million per year after accounting for program costs [27]. As of today, there are over 40 published peer-reviewed papers showing the overwhelming public health benefits of Insite [28].

## DECRIMINALIZATION: CASE STUDY OF PORTUGAL

Insite is a great provincial pilot initiative of HR however, Canada should look towards countries that have enacted national level harm reduction policies - Portugal is a leading example. In the 1990's Portugal was facing an increase in intravenous heroin users who were obtaining drugs from illegal markets [29]. A barrier in addressing the heroin problem was the marginalization and social exclusion of drug users due to its criminalization. Eventually, public sectors like law and health identified criminalization as perpetuating the problem [29].

In 2001, Portugal's Government decriminalized the possession and use of all illicit drugs, paving the way for the incorporation of further HR strategies [29]. This drastic paradigm shift to HR is likely related to Portugal having the highest rate of HIV/AIDS in intravenous drug users in the European Union [30]. HR policies that were introduced shifted the notion of drug use from a criminal offence to administrative offence, introduced shelters, drop in centres, and needle exchange programs [30]. This led to reduced consumption of illicit drugs, reduced burden of drug offenders in the criminal justice system, increased utilization of drug treatment programs, reduced mortality rates from opioids and infectious-disease-related deaths, and reduction in social-stigma against individuals with SUDs [29]. Taking elements from the Portuguese model, Canada could address OAD and SUDs through federally mandated decriminalization of illicit drug use and personal possession.

## CONCLUSION

The lack of support for individuals with addictions can partly be attributed to stereotypes perpetuated by the criminalization of drug use and possession. Addressing SUDs using HR approaches has been shown to decrease social harms and healthcare costs [18,19]. Federal decriminalization could result in more public support and political will at the provincial and territorial level for HR efforts and shift the focus to core issues related to SUD. This could change the narrative surrounding OAD and SUDs so those with SUDs are not seen as criminals but, instead, people whose health outcomes could be improved through HR interventions.

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# De/captivated

*The piece relates to the decriminalization of drug use in Canada, with the intended meaning favouring liberation from drug addiction as opposed to further captivation. The piece visually represents the idea that those who suffer from drug addiction are already held captive by their addiction. Commonly administered drugs for rehabilitation, such as buprenorphine/naloxone and mirtazapine, are placed on the open cuff, while misused addictive substances, such as cocaine, are on the closed cuff. When facing addiction, further captivity should not be enforced, rather the goal should be for the patient's liberation via a variety of alternative methods, including, but not limited to, rehabilitative drugs.*

*Art by Manda Ruth Novokmett*

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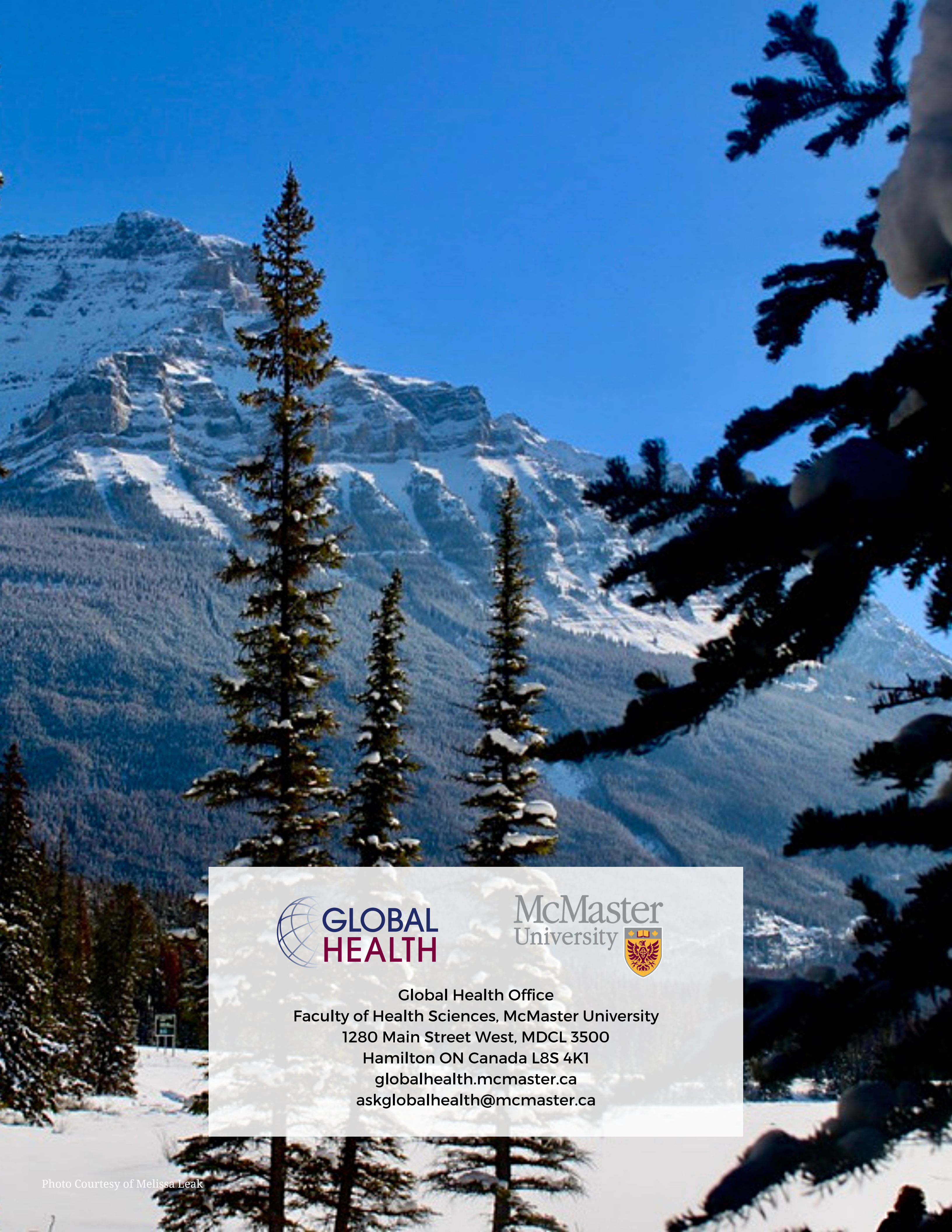

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