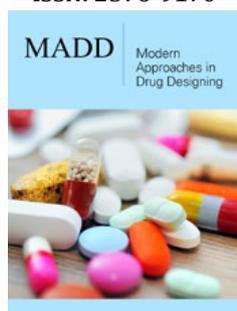


# Global Warming, Antibiotic Resistance and COVID-19

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## Abstract

Our world is currently faced with three major problems: Global warming, antibiotic resistance and COVID-19. Global warming is mainly caused by the emission of “greenhouse” gases such as CO<sub>2</sub>, methane (CH<sub>4</sub>) and nitrous oxide (N<sub>2</sub>O). Global warming has manifested itself in the melting of ice caps, glaciers, rising sea levels, flooding, intense unseasonal rainfall, intense hurricanes, drought or periods of extremely dry weather, higher heat index etc. It has affected the entire world, of which the Caribbean is of no exception. These include destruction of country infrastructure and economy, flooding etc. For example, on September 1, 2019, the eye of Hurricane Dorian made landfall on the Abaco Islands with maximum sustained winds of 185mph (295km/h), making it the strongest hurricane on record to affect the Bahamas. The effects of Hurricane Dorian in the Bahamas in 2019, were amongst the worst experienced for any natural disaster in the country. Hurricane Dorian struck the Abaco Islands as a Category 5 hurricane and a day later hit Grand Bahama Island at the same category. Damage amounted to US\$3.4 billion, and there were at least 74 deaths in the country. Antibiotic resistance, results from indiscriminate use of antibiotics and is on the rise. It mostly occurs with the use of synthetic analogues and thus research in herbal medicines and commercialization should intensify. Coronavirus disease 2019 (COVID-19), is a contagious disease induced by severe acute respiratory syndrome, coronavirus 2 (SARS-COV-2). The first case was identified in Wuhan, China, in December 2019. Since then, it has become a pandemic. To date 117,764,619 million cases have been reported, with over 2,613,747 deaths and 66,737,497 recovered cases. In Guyana, as of March 10, there are 8,847 confirmed cases, 204 deaths, with 8,200 recovered cases. To date, four vaccines have been approved for the fight against COVID-19.

**Keywords:** Global warming; Antibiotic resistance; COVID-19, Greenhouse gases; Herbal medicines; Commercialisation

## Introduction

Our world is currently faced with problems arising from Global warming, antibiotic resistance, and COVID-19. Whether you are in the United States, Europe, Caribbean, or any part of the world, there is need to take note of Global warming, antibiotic resistance, and COVID-19. Global warming, also referred to as climate change, is the observed century-scale rise in the average temperature of the Earth’s climate system and its related effects [1-3]. There is an urgent international need to curb the emission of greenhouse gases such as carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>) and nitrous oxide (N<sub>2</sub>O). Also, to synthesize environmentally friendly Pharmaceutical drugs that are non-halogenated in nature. The latter would prevent the destruction of the Ozone layer. Carbon dioxide is one of the main contributors of global warming. CO<sub>2</sub> traps heat, even though it is a natural component of the atmosphere. Carbon dioxide enters the atmosphere mainly from the burning of fossils fuels via industry, the use of vehicles, deforestation, and fires. The current worldwide status is that there is a chemical in balance in the level of CO<sub>2</sub> in our International atmosphere which has resulted in Global warming. The carbon cycle is no longer a cycle. Global warming has manifested itself in the melting of ice caps, glaciers, rising sea levels, flooding, intense unseasonal rainfall, intense hurricanes, drought or periods of extremely dry weather, higher heat index etc. The temperature of our planet has risen by 1-2 °C. The artic is warming several times faster than most of the planet. Ice is melting on land and at sea. The release of fresh water into the oceans has changed and will continue to change the course of currents that play a vital role in climate. The volume of water in ocean has risen. Satellite data imagining shows the perennial ice cover has decreased by 9% over the decade [4-9].

Global warming has seriously affected the lives of many worldwide. Examples include the serious catastrophic hurricane, Ivan who has devastated 90% of Grenada in 2004 and the one that affected lives in Florida in 2004. Guyana and Venezuela experienced unexpected

flooding in 2005, another manifestation of Global Warming. Also, the flooding experienced in New Orleans, Louisiana, USA in 2005. Several intense regular hurricanes recently have seriously affected lives in the Caribbean and the USA. Hurricane Dorian's destruction in the Bahamas, in September 2019 is noted. On September 1, the eye of Hurricane Dorian made landfall on the Abaco Islands with maximum sustained winds of 185mph (295km/h), making it the strongest hurricane on record to affect the Bahamas. The effects of Hurricane Dorian in the Bahamas in 2019, were amongst the worst experienced for any natural disaster in the country. Hurricane Dorian struck the Abaco Islands as a Category 5 hurricane on September 1, and a day later hit Grand Bahama Island at the same category. Damage amounted to US\$3.4 billion, and there were at least 74 deaths in the country [10-14].

The world needs to mitigate Global Warming. Our planet is in a chaotic state. The Caribbean has been mostly seriously affected. The Caribbean Diaspora can significantly help in preventing Global warming in the Caribbean and the rest of the world. This includes the formation of an International Caribbean Diaspora Committee on Anti-Global warming which can strongly petition against countries such as the USA and England (of which a large percentage of a Diaspora reside), China, Japan and some of the European countries via the United Nations to forcibly ensure that protocols such as the Kyoto and Montreal, under the United Nations Framework Convention on Climate Change (UNFCCC) be followed seriously so as to ensure that the CO<sub>2</sub> level and other Greenhouse gases is below the threshold limit. An eminent member of the Committee on Climate Change can visit the Caribbean yearly to give lectures and provide update on the progress of the Committee. In addition, to meet with the President and Government ministers to render advice on Global warming. Policies such as reforestation, the use of renewable energy in place of fossil fuels, significant improvement in our sea defence infrastructure should become a reality for Guyana and Small Island State. The committee should also endeavor to secure financial aid via international bodies and their own for fellow Caribbean countries in wake of natural disasters such as hurricanes, flooding etc. that results from Global Warming. It is predicted that the temperature of the earth will rise to 6 °C in the next century, if global warming is not prevented and what more catastrophic that will be [15-18].

Antibiotic resistance (AR or AMR) is the resistance to antibiotics by bacteria. There has been a worldwide increase in antibiotic resistance due to indiscriminate use of the antibiotics i.e using the incorrect antibiotic against the incorrect bacterial strain. Bacterial strains developed a range of mechanisms to protect against the drug. These include the production of enzymes that will destroy certain prime selective groups in the drug molecule that are necessary for it to act. For example, bacteria produce the enzyme,  $\beta$ -lactamase that will destroy the  $\beta$ -lactam ring of penicillin. The latter is necessary for the antibacterial effect of the drug, penicillin. Other methods bacteria have evolved to protect against the drug, include an increase efflux of the drug across the bacterial membrane, the protection of bacterial ribosomes via processes such as methylation, induced by the enzymes methylase, decrease influx of the drug across bacterial

membrane. All these processes are facilitated by indiscriminate use of selected antibiotics. Antibiotic resistance is mostly induced against synthetic antibiotics. Herbal natural antimicrobials seem to suffer less antimicrobial resistance, in comparison to the synthetic analogue. In this regard, the continued rise in herbal medicinal research in the Caribbean is anticipated.

Coronavirus disease 2019 (COVID-19), is a contagious disease induced by severe acute respiratory syndrome coronavirus 2 (SARS-COV-2). The first case was identified in Wuhan, China, in December 2019. It has since spread worldwide and became a pandemic in March 2020. Added to this, is the emergence of a mutant SARS-COV-2-viral strain (B.1.1.7) in the UK in December 2020 and SARS-COV-2-viral strain (B.1.1.7) and B.1.526 viral strain in the New York, USA in March 2021. COVID-19, is spread between people during close contact via small droplets, produced by coughing, sneezing, talking, and singing. It's also airborne, requiring particulate matter for transmission. A person can become symptomatic or remain asymptomatic. COVID-19 can be prevented by social distancing and the wearing of cloth face masks, surgical masks, respirators, or other face coverings to control droplet transmission. Even though a vaccine, manufactured by Pfizer and Moderna and approved by FDA, is now commercial, the entire world awaits widespread inoculation. COVID-19 has affected humanity in many facets: health, socially, economically and in education. In health, a tremendous burden has been placed to save patients life as the number of mortality and morbidity cases increases across the globe. To date, 117,764,619 million cases have been reported with over 2,613,747 deaths with 66,737,497 recovered cases. In Guyana, as of March 10, there are 8,847 confirmed cases, 204 deaths, with 8,200 recovered cases the economy of every country has been affected, as there have been severe job cuts, lockdown, decrease in world trade, border shut down etc. Production and productivity have significantly fallen across the globe in every sector. In the education sector, many universities, primary and secondary schools around the globe have resorted to online teaching, as opposed to "Face to Face" teachings. While this, to a large extent, is effective at the University level, it is not so at primary and secondary schools. COVID-19 has dramatically changed the social fabric of societies around the globe. Social gathering is prohibited, as denounced by the World Health Organisation (WHO) and the United States Centre for Disease Control (CDC). Many restaurants and other business places have been operating within the curfew periods. Church gathering have also been prohibited. Now, we must adhere to protocol enacted by WHO and CDC, in addition to get inoculated from anti-COVID-19 vaccine from Pfizer, Moderna and Oxford AstraZenica. Other anti-COVID-19 vaccines available are Chinese Sinopharm, CanSinoBio and Russia Sputnik V vaccines [19-21].

## Conclusion

Our world is faced with three major problems: global warming, antibiotic resistance and since March 2020, the ongoing COVID-19 pandemic. Thus, there is an urgent need to mitigate all three. Scientific organizations, such as the American Chemical Society, Royal Society of Chemistry, Third World academy of Sciences, TWAS and the Caribbean Academy of Sciences (CAS) governments

and other governmental organization, should advocate for the realization of all international policies on global warming, such as Kyoto, Montreal Protocols, etc. Research in the use of herbal medicines should continue to proliferate in the Caribbean, taking into consideration that herbal medicines will induce less antimicrobial resistance and with regards to COVID-19, strict adherence to WHO and CDC protocols and further research into natural antivirals across research institutes.

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