

Microplastics and COVID-19 in Africa: A Threat to the Environment (Public Health Concern)

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Highlights

Microplastic pollution is increasing in the face of Covid-19 in Africa.

- The unprecedented use of PPEs to prevent transmission of Covid-19 is threatening the environment.
- The waste generated from PPEs is not managed properly.
- Monitoring to ensure environmental safety and reducing the amount of microplastic waste generation by proper disposal is paramount.
- Africa needs the collective efforts of individuals, institutions, and industries to avert further environmental threats of uncontrollable plastic production and usage.

Since the emergence and declaration of the Covid-19 as a pandemic by the World Health Organization [1], various measures have been adopted worldwide to control the rapid spread of the virus, including in Africa. According to the World Health Organization, transmission occurs by direct contact with infected people or surfaces contaminated by the novel coronavirus. Various world countries declared a state of emergency, placing a ban on all forms

of social gathering by instituting the stay-at-home policy, travel restriction, self-isolation, social distancing, and proper personal hygiene practice by frequently washing hands with clean water and applying hand sanitizers. Also, wearing personal protective equipment (PPE) such as face masks is highly emphasized [2,3,4]. Such practice remained the best shield against the spread of Covid-19 until a vaccine was developed. This has triggered the massive usage and production of PPEs. There is a need to understand the emerging threat of "COVID waste" to our environment and address it as soon as possible. With Covid-19 emergence into the atmosphere that has already grossly bedeviled with plastic pollution and reckless waste disposal practices, concerns have been expressed about the upsurge in usage and manufacture of PPEs for citizens to comply with new regulations. The Covid-19 pandemic has invariably shown rapid expansion in manufacturing desperately needed plastic-made personal protective equipment, including disposable face masks (surgical and non-surgical), face shields, hand gloves, gowns, plastic containers for hand sanitizers, and protective gear. The increase in consumption and production of these materials has paved the way for a new environmental challenge and the large plastic waste in the environment.

These single-use plastic materials need to be appropriately discarded to prevent the spread of infection and protect the environment from pollution. PPEs need to be handled as well as infectious waste and, if not disposed of with care, pose a contamination risk to others who are either handling the waste or waste pickers that live off landfills and dumps. Therefore, such items used as a protective cover against the spread of the virus need to be handled by trained personnel. Plastic PPEs could be recycled in most African countries, by passing the material through the electro-thermal deactivation process. When the process is completed, such recyclable materials could be returned to the economy instead of being lost to hazardous landfill sites. Also, Africa has been fortunate not to witness large volumes of plastic medical waste in public spaces, such as several other beaches. This could be because Africans have tended to use reusable cloth masks instead of single-use plastic options. As a result of the pandemic, demand for these essential and single-use plastic materials (which help protect against the virus spread) such as masks, gloves, protective gowns, and face shields, now commonly known as “COVID waste,” has drastically increased. Approximately 89 million face masks were required to control COVID 19 every month. Also, gloves are going up to 76 million, 1.6 million goggles per month [5]. This has resulted in a phenomenal rise in the productions of PPEs (produced from Polymeric Nanofibers) worldwide. Although these single-used plastic materials were initially made for medical personnel and healthcare workers (HCWs) to prevent occupational hazards, the use of facemasks was adopted by non-medical professionals during the outbreak of SARS and PDM H1N1 in 2003 and 2009, respectively [6,7]. In the bid to stem the widespread of the virus, authorities have recommended the same to the masses.

Researchers advocate using face masks and other PPEs by the general public until the transmission mode of Covid-19 is clearly understood [8]. It has been argued that such precautionary measures could help reduce the number of times one touches the face/mouth/nose with unwashed hands, which could greatly lower the chance of infection [2]. Previous studies have shown the effectiveness of face masks in protecting against respiratory disease during religious activities [6,9]. The use of plastic polymers has considerable benefits to society. However, MP fragments, which largely ‘depend on the plastic age,’ come with harmful health and environmental impacts. This is usually a result of improper handling of the plastic waste derived from these materials. PPEs present unique problems. This is because of the troubles they cause to marine life when they get into water bodies. Recent studies have reported the presence of face masks in aquatic habitats [10], posing significant potential risk to the environment. Also, due to incorrect disposal procedures, more than 10 million face masks are dumped into the environment each month [11]. Moreover, the irony is that, while we produce and discard plastic in the fight against one public health crisis or the other, we may be slowly contributing to another situation, which might be more severe than the former. Face masks are generally manufactured from nanofiber plastic materials. “Use and through” polymeric (polypropylene, polystyrene) materials have been identified as a significant source of microplastics and microplastic pollution in the environment [12]. For instance, different packaging plastic materials, bottling plastic materials, and containers from the food processing industries are principal sources of microplastic pollution, such as fibers and particulate matter in the ocean, freshwater, and the marine environment globally [13].

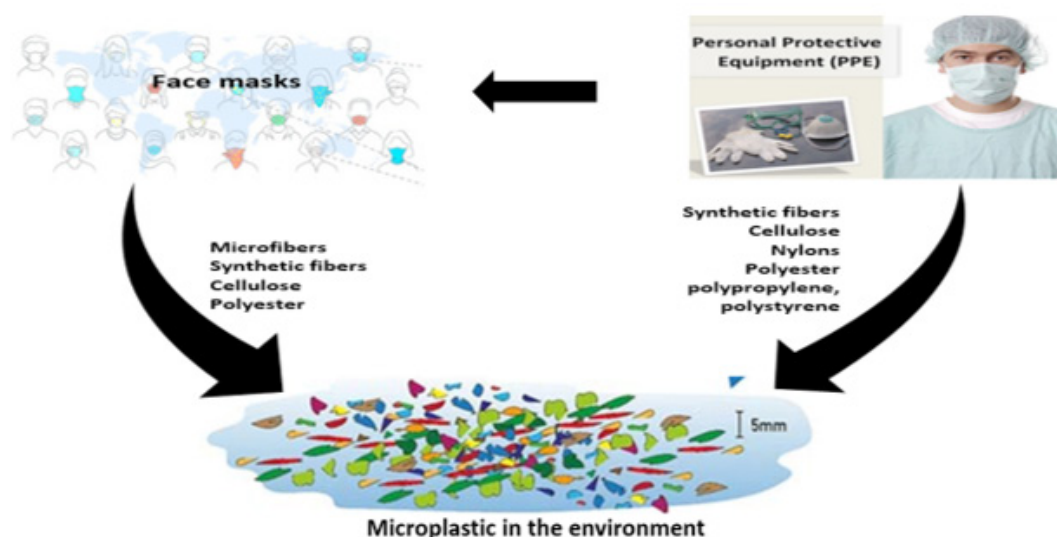


Figure 1: The environmental fate of microplastics release from PPEs.

In South Saharan African countries, to build a substantial body of evidence of the impacts of plastic on the environment and health, the Waste Research Commission (WRC) is funding leading research aimed at understanding the health and ecological implications of microplastic in freshwater resources. Therefore, there is a need for health workers and other users of plastic materials to ensure environmental safety by reducing the amount of waste generation and ensuring proper disposal. Many researchers believe that in 2050 there will be more plastic than fish in the ocean if drastic measures are not employed to control the rate of plastic production and their waste. Therefore, there is a need for collective efforts of individuals, institutions, and industries to stem the tide of plastic, which has become a menace that threatens our quality of life. However, contributory efforts are pertinent in Africa for averting further public health catastrophe and its public health consequences by seeking alternative materials (not made of plastics) to produce the Covid-19 PPEs and face masks.

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Conflict of Interest

There is no existing conflict of interest.

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