Discarded pandemic face masks could harm wildlife for years to come

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Entanglement is a significant threat to the health of birds, especially those which spend a lot of time at sea. Credit: Trish Loli Brewster

While no longer as prevalent as they once were, the billions of face masks and gloves that were produced during the pandemic are making plastic pollution an ever-greater issue.

The impacts of COVID-19 go far beyond the disease itself, and are set to stay with us for centuries to come.

A study using community science observations from around the world found that disposable face masks and plastic gloves could pose an ongoing risk to wildlife for tens if not hundreds of years. Entanglements were one of the most prevalent threats, with some animals being killed after becoming caught in the plastic debris.

Dr. Alex Bond, the principal curator and curator in charge of birds at the museum, was a co-author on the paper published in *Science of The Total Environment*.

"Ultimately, we really don't know how big a problem pandemic waste could be," Alex says. "As many areas of the world had restrictions on non-essential movement, we will never be able to know the true extent of the issue, but this study gives us a snapshot into the sheer diversity of species that were affected."

While the study captures only 114 observations from around the world, it is likely that it represents just a fraction of the much larger impacts of COVID-19 waste on wildlife.

With an estimated global demand of over 129 billion masks per month at the height of the pandemic, the effect of pandemic waste will become more pronounced as even more plastic works its way into our ecosystems.

"We filter out most litter in our environment, as it represents examples such as crisp packets or cigarette butts that we've seen for years or decades," Alex adds. "When PPE [personal protective equipment] flooded our waste management systems in the early days of the pandemic, it was a lot more obvious because it was new."

"Now we don't even flinch when we see a blue face mask on the ground. It's rapidly become part of our everyday experience of waste in our environment."

How did the COVID-19 pandemic affect plastic pollution?

When COVID-19 was declared a pandemic in March 2020, it kickstarted what the scientists describe as an "unprecedented increase in the production and use of single-use plastics."

The market value of the PPE industry jumped by around 200 times in the first year of the pandemic as legal requirements were introduced in countries around the world to stem the spread of the virus.

Some of these requirements specified particular types of face mask and other protective gear, most of which was single use. From March to October 2020, this caused the amount of abandoned face masks to increase by more than 80 times to represent almost 1% of all dumped litter globally, and as much as 5% in the U.K.

Some of these masks even made their way to uninhabited areas, with 70 face masks found on the beaches of the Soko Islands believed to have washed ashore from nearby Hong Kong.

Disposable gloves, meanwhile, initially jumped to around 2.4% of dumped litter globally in April 2020 but then dropped back to 0.4% as the year progressed.

As levels of litter increased, wildlife struggling with pandemic-related debris became more common. For instance, the RSPCA raised concerns after rescuing a gull which was having difficulty walking because of a

mask tangled tightly around its legs.

The litter has also been linked to wildlife deaths, with one of the first believed to be an American robin found dead in Canada in April 2020 after becoming entangled in a face mask. Later that year, a face mask eaten by a Magellanic penguin in Brazil is believed to have led to the bird's death.

Even if not the direct cause of death, litter can weaken wildlife and make them more susceptible to fatal injuries. For instance, a gull in Rotterdam was struck by a car while tangled in a mask, which is believed to have limited its ability to escape.

Aside from birds, COVID-19 masks and gloves have also affected bats, crabs, hedgehogs and a variety of other wildlife.

The researchers behind the current study wanted to investigate the ways in which this debris has affected wildlife, and how community scientists could help investigate at a time when international travel was heavily restricted.

How were wildlife affected by COVID-19 waste?

The researchers used data from a variety of sources, including unpublished scientific reports, community science platforms and social media networks. The witnesses were then contacted to gain as much information about each pandemic waste incident as possible.

In total, the researchers gathered 114 sightings, of which 83% involved birds. Mammals were the next most exposed to COVID-19 waste, in 11% of sightings, while 3.5% of sightings featured invertebrates and 2% involved fish.

The results reflect existing research which shows that birds are at particular risk of entanglement from plastic, with an estimated third of seabird species and a tenth of freshwater species known to have been caught in synthetic items.

As a whole, entanglement reflects around 42% of the impact of pandemic waste on wildlife, but this is only slightly more than the 40% of sightings which saw masks and gloves used to build nests.

"Many birds build nests and they generally build them out of filamentous items, whether that's grass, twigs, moss or spider silk," Alex says. "Unfortunately, a lot of rubbish has the same characteristics, particularly objects like masks that have strings to loop around the ears. When that is incorporated into nests, it presents a significant entanglement risk to both adults and their chicks."

Though the study was limited to English language searches, and social media platforms that aren't as dominant in some nations of the world, the research provides an insight into how the pandemic will continue to affect the environment.

With disposable face masks estimated to take up to 450 years to decompose, the waste left behind by the response to COVID-19 will have to be considered in any future attempts to tackle global plastic pollution.

In this fight against waste, the study demonstrated that community scientists could be relied upon as allies to help find and alert others to the problem.

The researchers called for greater efforts to develop more streamlined community science platforms to help people from all walks of life to assist scientists and policymakers in the battle against plastic pollution

while making the field more equitable.

More information: Justine Ammendolia et al, Tracking the impacts of COVID-19 pandemic-related debris on wildlife using digital platforms, *Science of The Total Environment* (2022). DOI: 10.1016/j.scitotenv.2022.157614

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