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Accumulation of plastic waste during COVID-19

Tanveer M. Adyel

+ See all authors and affiliations

Science 11 Sep 2020:
Vol. 369, Issue 6509, pp. 1314-1315
DOI: 10.1126/science.abd9925

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As lockdowns took effect to slow the spread of coronavirus disease 2019 (COVID-19), the global demand for petroleum collapsed. As a result, oil prices plummeted, making the manufacture of virgin plastics from fossil fuels less expensive than recycling (1). This cost incentive, along with lifestyle changes that increase plastic use, has complicated the challenge of overcoming plastic pollution.

During the pandemic, personal protective equipment (PPE) has driven increased plastic pollution. In response to high PPE demand among the general public, health care workers, and service workers, single-use face mask production in China soared to 116 million per day in February, about 12 times the usual quantity (2). The World Health Organization has requested a 40% escalation of disposable PPE production (3). If the global population adheres to a standard of one disposable face mask per day after lockdowns end, the pandemic could result in a monthly global consumption and waste of 129 billion face masks and 65 billion gloves (4). Hospitals in Wuhan, the center of the COVID-19



Medical waste generated by COVID-19 protocols has overwhelmed waste treatment facilities in Wuhan, China.

PHOTO: CHINE NOUVELLE/SIPA/NEWSCOM

Individual choices during lockdowns are also increasing plastic demand. Packaged take-out meals and home-delivered groceries contributed an additional 1400 tons of plastic waste during Singapore's 8-week lockdown (7). The global plastic packaging market size is projected to grow from USD 909.2 billion in 2019 to 1012.6 billion by 2021, at a compound annual growth rate of 5.5%, mainly due to pandemic response (8).

This global health crisis puts extra pressure on regular waste management practices, leading to inappropriate management strategies, including mobile incineration, direct landfills, and local burnings (9). Improper disposal of just 1% of face masks translates to more than 10 million items, weighing 30,000 to 40,000 kg (10). Waterlogged COVID-19-related plastic has been observed on beaches and in water (11), potentially aggravating the challenge of curtailing microplastics.

At the regional and national levels, prioritization of human health over environmental health has led to the delay or reversal of policies aiming to reduce single-use plastic (9). As a result, demand for recycled plastic material has dropped, the profit margins of recycling have decreased, and the environmental footprint of plastics has increased (9). We need urgent and coordinated commitment to circular economy approaches, including recycling practices and strict policies against plastic pollution. Companies should continue efforts to curtail virgin plastic use and increase plastic recycling to live up to their corporate social and environmental responsibilities. Without a concerted effort to protect the environment during and after the pandemic, we are unlikely to meet the United Nations' Sustainable Development Goals (12).

[Google Scholar](#)

2. ↩ F. Bermingham, S.-L. Tan, "Coronavirus: China's mask-making juggernaut cranks into gear, sparking fears of over-reliance on world's workshop," *South China Morning Post* (2020); www.scmp.com/economy/global-economy/article/3074821/coronavirus-chinas-mask-making-juggernaut-cranks-gear. [Google Scholar](#)
3. ↩ "Shortage of personal protective equipment endangering health workers worldwide" (WHO, 2020). [Google Scholar](#)
4. ↩ J. C. Prata, A. L. Patrício Silva, T. R. Walker, A. C. Duarte, T. Rocha Santos, *Environ. Sci. Tech.* **54**, 7760 (2020). [Google Scholar](#)
5. ↩ M. Zuo, "Coronavirus leaves China with mountains of medical waste," *South China Morning Post* (2020). [Google Scholar](#)
6. ↩ S. Cutler, "Mounting medical waste from COVID-19 emphasizes the need for a sustainable waste management strategy" (Frost & Sullivan, 2020). [Google Scholar](#)
7. ↩ S. Bengali, "The COVID-19 pandemic is unleashing a tidal wave of plastic waste," *The Los Angeles Times* (2020). [Google Scholar](#)
8. ↩ "COVID-19 impact on packaging market by material type, application and region—global forecast to 2021," *Business Insider* (2020). [Google Scholar](#)
9. ↩ A. L. P. Silva et al., *Sci. Total Environ.* **742**, 140565 (2020). [Google Scholar](#)
10. ↩ "In the disposal of masks and gloves, responsibility is required" (World Wildlife Fund, 2020); www.wwf.it/scuole/?53500%2FNello-smaltimento-di-mascherine-e-guanti-serve-responsabilita [in Italian]. [Google Scholar](#)
11. ↩ G. Stokes, "No shortage of surgical masks at the beach" (Oceans Asia, 2020). [Google Scholar](#)
12. ↩ United Nations, "Sustainable development goals" (2015); www.un.org/sustainabledevelopment/sustainable-development-goals/. [Google Scholar](#)

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Science
Vol 369, Issue 6509
11 September 2020

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