

# Experts urge action on medical test kit waste

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Spiraling use of throwaway medical testing kits is driving a major environmental impact that must be urgently addressed, experts say. Their research is published in the journal *Lab on a Chip*.

The researchers have begun talks with manufacturers and medical

agencies about how so-called single-use diagnostics can be produced more sustainably. The team says biodegradable alternatives to fossil-derived plastics should be used to manufacture kits, including those that test for COVID-19.

Thought should also be given to where they are made, the packaging being used and what happens to them once they have done their job of diagnosing illness.

## **Biological sources**

Greater use of paper and plastics derived from biological sources could transform the global market for point-of-care tests, which is set to rise from \$43 billion this year to \$72 billion by 2024.

During the COVID-19 pandemic, several billion single-use diagnostics were used each year—on top of 412 million malaria tests, 3 million tuberculosis tests and 2.4 million HIV tests.

Devices usually made of unsustainable [plastics](#) must often be incinerated to reduce infection risk, creating an additional release of greenhouse gas, and potentially other pollutants. Some diagnostics also contain [toxic chemicals](#) like cyanide derivatives, which are damaging to environmental and [human health](#) if not disposed of properly.

## **Innovation needed**

Lead researcher Maiwenn Kersaudy-Kerhoas, of Heriot-Watt University, acknowledges there is already some innovation happening in the field, but more is needed.

"Point-of-care [diagnostic tests](#) carry great promise for health, but the

pandemic highlighted how much medical waste is produced, and of course, it exacerbated the problem," says Professor Kersaudy-Kerhoas. "There is an urgent need to find solutions that reduce the carbon footprint of these devices. It's up to engineers, manufacturers and clinicians to work together to make this a priority."

## **Health care transformed**

The use of single-use diagnostics, or point-of-care tests, has exploded and transformed health care around the world. Such tests are used in hospitals and GP surgeries, in the field and in people's homes, providing quick and reliable results.

They carry great promise for global health, including meeting urgent needs for testing and diagnosis in places with limited laboratory facilities.

## **Extreme heat**

Researcher Alice Street, of the University of Edinburgh's School of Social and Political Science, says some of these tests need to be incinerated above 800 degrees Celsius.

"They are not designed for under-resourced systems or countries where they can usually be of most use," says Dr. Street, who is an expert in diagnostic devices. "In some areas, they will be placed in municipal waste dumps or burned where the [toxic substances](#) within could leach into the ground, or be carried in fumes that are inhaled by people locally."

Professor Kersaudy-Kerhoas and Dr. Street are part of an international team of scientists, manufacturers and end-users from Spain, France,

Ethiopia and South Africa.

**More information:** Alfredo Edoardo Ongaro et al, Engineering a sustainable future for point-of-care diagnostics and single-use microfluidic devices, *Lab on a Chip* (2022). [DOI: 10.1039/D2LC00380E](https://doi.org/10.1039/D2LC00380E)

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