

Researchers ask, how sustainable is your toothbrush?

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Researchers at Trinity College Dublin have examined the sustainability of different models of the most commonly used oral health product—the toothbrush—to ascertain which is best for the planet and associated

human health.

Although the toothbrush is a widely recommended healthcare device worldwide, there is currently little quantitative data available for its impact on the planet. The research study, in collaboration with Eastman Dental Institute at University College London, is published in the *British Dental Journal* today (Tuesday, 15th September 2020). It represents the first time a life-cycle assessment (LCA) has been used to measure environmental consequences of a healthcare product.

Healthcare is a major emitter of environmental pollutants that adversely affect health, but awareness of these effects remains low both in the industry and in the general consumer population. There is currently little evidence or guidance regarding the sustainability of specific healthcare interventions, services or devices.

Researchers considered different manufacturing models of the toothbrush and measured the environmental impact (carbon footprint) and human health impact (DALYS) of the toothbrush. The electric toothbrush, the standard plastic brush, the plastic brush with replaceable head, and the bamboo brush were used. The team found that the electric toothbrush was comparatively harmful for planetary health.

The findings highlight the [human health](#) burden of the toothbrush manufacturing process. The electric toothbrush causes 10 hours of disability measured in Disability-Adjusted Life years or DALYS mainly for the people associated with the process of making and producing the devices. This is five times higher than a normal plastic brush.

The team found that the most environmentally sustainable toothbrush was not bamboo, as could perhaps be popularly believed, but a hypothetical continually recycled plastic toothbrush.

This simple comparative LCA showed that a plastic manual replaceable head toothbrush and bamboo manual toothbrush perform better than traditional plastic manual and electric toothbrushes in every environmental impact outcome measure used in this study. These results could be used to inform individual consumer choice, oral health recommendations, procurement of toothbrushes for public health programs, and toothbrush manufacturers. Using LCA to inform healthcare policies and recommendations will help healthcare providers move towards a more environmentally sustainable system.

Dr. Brett Duane, Associate Professor in Public Dental Health at Trinity College and lead researcher said, "There are billions of toothbrushes used and discarded every year. Our research shows that electric toothbrushes are actually harmful for the planet and to the people involved in the manufacturing process and distribution. There is not a lot of evidence to show they are more effective unless you struggle to clean your teeth with a normal toothbrush. We have also shown bamboo toothbrushes are not the answer. Using them just stops land from being put to better use such as helping biodiversity, or in growing forests to offset carbon emissions."

The ideal [toothbrush](#) is one which uses plastic which is recycled in a continuous process. Plastic brushes which can be recycled don't take up a lot of land and they don't need lots of water to grow. The important thing here is to keep the plastic in the recycling chain. We need a system where plastic toothbrushes can be collected like batteries and then recycled into new products. If the [plastic](#) escapes the recycling chain, it needs to be able to be easily and naturally broken down into harmless products.

Manufacturers, consumers, health professionals, and health policy makers should consider environmental sustainability as well as money and people's [health](#) when recommending products. Governments and

industry should consider how they could support recycling programs. More funding is also required to support sustainability research in this area."

Provided by Trinity College Dublin

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