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MICRO AND NANO-PLASTICS A NEW CONCERN FOR PUBLIC HEALTH?

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Plastic and its degradation products are growing and becoming a global emergency. In the "Plasticene era" the degradation of plastic, exacerbated by climate change, generates microplastics (MP) and nanoplastics (NP). Due to their small size, they are transported everywhere, and therefore we find them increasingly in the air, in the sea and in fresh water, in the soil, and bioconcentrated in the food chain. Food consumption is one of the most important human exposure pathways to MPs that have been found in all food. MPs, due to their oxidative stress and inflammatory effects, are a growing concern for human health. Furthermore, due to their hydrophobic surface, they act as a Trojan horse for other types of environmental contaminants that are known to be toxic and endocrine disruptors. MPs and NPs enter the human body mainly through ingestion of food, water and other beverages, as well as through inhalation and direct contact with the skin. They have been found in the placenta, urine, follicular fluid, atheromatous plaques, seminal fluid as well as in blood which transports them throughout our body. Several studies in mammals indicate that MPs smaller than 10 μm can cross cell membranes, posing potential health risks through oxidative stress, inflammation, immune dysfunction, neurotoxicity, altered metabolism, impaired cell proliferation, alteration of the gut microbiota, abnormal tissue development and carcinogenicity. Our studies on human populations have highlighted the negative role of MPs in male and female fertility, in dialysis subjects, in groups with bowel diseases and colorectal cancer and in subjects with major depression. The topic in question is currently at the centre of scientific research, posing an urgent need for prevention interventions at all levels and requiring legislative and cultural interventions to reduce plastics from production to consumption according to a One Health perspective in a Planetary Heart vision.