

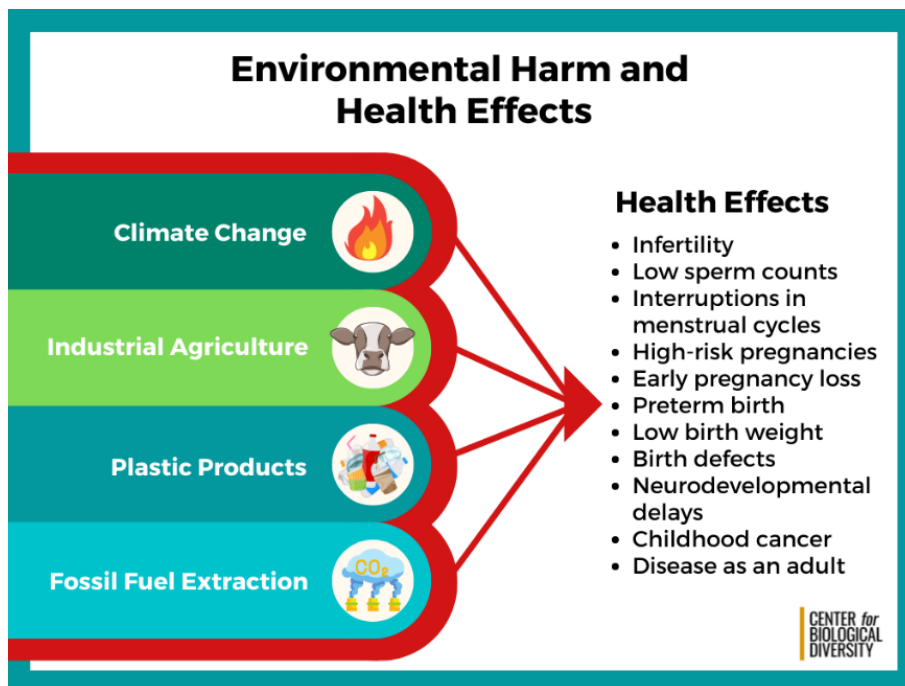
About This Paper

Our health and the environment are deeply interconnected. The exploitation of people, animals, and nature drives the environmental crises we face today and damages the health of the most marginalized people. Reproductive health, specifically, is affected by poor environmental quality, making it difficult for parents have healthy pregnancies and raise their children in safe and healthy communities. Improving environmental conditions results in positive public health outcomes and is essential for achieving reproductive justice.

Many invisible environmental threats — such as toxic chemicals in the air and water and extreme temperatures — impede reproductive justice and cause harm to pregnant people, fetuses, infants and children. This paper explores how the production of plastic products — driven by capitalism — effects reproductive health.

This is just one chapter in a much larger report, [The Influence of Environmental Toxicity, Inequity and Capitalism on Reproductive Health](#). The report seeks to help people understand the links between environmental harm and reproductive harm more clearly. It also explores the role capitalist systems play in undermining reproductive and environmental health and hopes to demonstrate that in order to achieve reproductive justice we must overhaul extractive and exploitative systems to help people and the planet thrive.

By exposing the connections between plastic products and negative reproductive health outcomes such as infertility, low sperm counts, interruptions in menstrual cycles, high-risk pregnancies, early pregnancy loss, birth defects, preterm birth, and low birth weight, we hope to increase awareness of the invisible threat of plastic products, illuminate the role of capitalist growth models in causing harm, and propose solutions for mitigating the ongoing reproductive injustice caused by this environmental crisis.



Visit [the website](#) to view the full report, including the chapters on fossil fuel extraction, industrial agriculture and climate change.

Plastic Products

The Issue

Plastic material goods are riddled with dangerous chemicals, including endocrine-disrupting chemicals (EDCs), that lead to harmful exposure during their lifecycle. Unfortunately, not all products are tested for the presence of EDCs. The factory production of plastics emits toxic pollutants into neighboring water, air and soil, while individuals everywhere are exposed to chemicals when using these products in their homes and workplaces. And disposal of these products does not make them disappear. Plastics can take hundreds of years to decompose, during which time they break down into microplastics in landfills or oceans. Burning plastics through harmful technologies such as gasification and incineration also releases toxic chemicals into the environment, which then can lead to [exposure of humans and wildlife](#).

To produce plastic goods, fossil fuels must be extracted from the land and transported to factories. At the factories, they are mixed with additional toxic additives to create different shapes, sizes, and colors of plastic particles, before being sent to other factories to become products and packaging. The processes that create plastics from fossil fuels release toxic particles into the air that build up in humans and ecosystems. Once produced, these toxic-laden products [enter the homes and workplaces of people around the globe](#).

When people use products made of plastic materials, they can be exposed to toxic chemicals via [ingestion, inhalation, and skin absorption](#). Many of these products [contain a range of harmful EDCs](#), including bisphenols (BPAs), phthalates and per- and polyfluoroalkyl substances (PFAS). BPAs and phthalates are often referred to as “everywhere chemicals” because of their ubiquitous nature. They are used to harden or soften plastic, respectively, and [can be found in](#) everything from children’s toys, canned food liners, plastic containers, baby’s teething products, personal care products, and even flooring or pipes.

PFAS is an umbrella term for a vast range of chemicals known as “forever chemicals” because [they do not degrade over time](#). This means that all PFAS already in existence will never disappear. PFAS are especially dangerous because they are persistent and [bioaccumulate in people](#). Unfortunately, they are widely used in domestic products, such as food packaging, nonstick cookware, cleaning products, cosmetics, shampoos, stain-resistant items, and water-repellent clothing. Their widespread use has caused [PFAS to pollute water, fish, soil and dust](#). With an estimated 6 million Americans drinking PFAS-contaminated water and nearly 99% of Americans [having PFAS in their blood](#), the chemical is already extremely widespread. Researchers have also discovered a wide range of links between PFAS and health concerns in wildlife, from immune-based diseases in turtles and dolphins to [hormonal changes in the brains of polar bears](#).

As plastic degrades over time, miniscule pieces of plastic called microplastics become fragmented from the original item. These microplastics then contaminate oceans, land, and air, becoming easily ingested by people, animals and ecosystems. These microplastics are long lasting and [remain in the soil for over 100 years](#). Technologies that break down plastic waste through heat are similarly dangerous, releasing toxic chemicals, such as dioxins, mercury and acid gases, which then get absorbed by the surrounding air, water and soil. These toxicants can travel long distances and [accumulate in plants, wildlife and humans](#). In fact, [about two-thirds of](#)

[all plastic ever produced remains](#) as tiny particles in oceans, soil, air, and human and animal bodies.

Toxic plastic pollutants are extremely durable, mobile, and ubiquitous and [it's almost impossible to completely eliminate exposure](#). EDCs easily move from plastic production, consumption and disposal sites through communities and into homes. Factories emit air, water and soil pollution, which enters homes through inhalation, drinking water and food. Simultaneously, individuals unknowingly purchase products made with phthalates, PFAS and BPAs, and are exposed through daily activities like cleaning a home, ordering takeout, or putting on makeup.

From 1950 to 2015, it was estimated that [global plastic production increased](#) from 2 million metric tons to 380 million metric tons. In the years since, the toxicity of the products has not diminished, and fossil fuel extraction has only increased the health risks associated with plastic production. This paper aims to provide a brief, introductory overview of the relationship between the lifecycle of plastic material goods and reproductive justice. It does not intend to cover the complex, comprehensive harms caused by this industry.

Reproductive Health Harms of Plastic

Reproductive harm is possible throughout the lifecycle of plastic products. The process of transforming fossil fuels into plastic releases toxicants into the air that have been [linked with developmental problems and low birth weight](#) for the offspring of industry workers or community members in neighborhoods adjacent to plastic manufacturing factories and reproductive cancers in adults. The products that come from these processes are equally harmful.

BPAs are linked to breast and reproductive cancers, endometriosis, reproductive challenges and early puberty. In young children [BPA exposures before and after birth are](#) linked to changes in brain development and behavior. Similarly, [prenatal exposure to phthalates](#) can lead to asthma, allergies, cognitive and behavioral problems, and can also affect reproductive development of boys and reduce fertility for men. This is because [phthalates lower sperm count](#), create less mobile sperm, and lead to overall birth defects in the male reproductive system. Male genital deficiencies [have also been linked with phthalate exposure](#). Soft plastics, which are largely made of phthalates, are strongly linked with endometriosis, a leading cause of infertility for those with a female reproductive system.⁶⁷ Like other EDCs these toxicants travel through the placenta of a pregnant person and expose the baby in utero to harmful chemicals.

PFAS are particularly damaging, with [exposure to even low levels affecting fertility and birth weight](#). While the industry claims otherwise, PFAS accumulates in people, with [detections in breast milk](#) doubling nearly every four years for women in the United States. Its longevity in breast milk contaminates nutritional sources for babies and exposes them to health risks during a critical time in their development. The existence of PFAS and other plastic toxicants in breast milk and the placenta violates the reproductive justice requirement for a safe and healthy environment.

How Plastic is Linked to Capitalism and Inequity

In many ways plastic products are the embodiment of capitalism: mass-produced cheaply and viewed as disposable. Their harms — and the harms caused by their manufacturing processes — [are well documented](#), but industry persists with large-scale production regardless of its

effects. While alternative, toxics-free items and processes exist that would limit harm to workers and consumers, they are currently more expensive to produce and thus [unappealing to corporations](#) that operate in a growth-driven capitalist model.



[Workers especially are at risk](#), facing health harms and possible death due to exposure to toxic chemicals. And since the United States does not require death and injury reporting for the contract workers who do the most dangerous jobs in these factories, the risks of working in plastic production are [underrepresented in safety data](#). For example, 15 workers who died in one BP plastic production factory explosion in Texas were contract workers, [so their deaths were not recorded in the company's safety records](#).

If growth continues to be held up as the primary measure of economic health, humans will continue to be exploited — and the environment pushed past its carrying capacity — to generate private profit.

Impacts on Workers

Workers in the factories producing plastics are repeatedly exploited by being exposed to the toxic chemicals used in plastics and often are left without adequate protections or information about the harms from those chemicals. Workers who process these EDCs, or make the products containing them, are more likely to be exposed by inhalation, skin absorption, or swallowing. [Inhalation is the most common method of exposure](#), increasing a person's likelihood of developing health issues. This is further complicated by low salaries, with the average non-supervisory worker in the U.S. plastics production system [making between \\$29,000 and \\$40,000 annually](#).

Women working in factories where plastics are created [are exposed to toxics that can cause breast cancer](#) and increased risk of reproductive challenges. Plastic manufacturers often aim to minimize costs by offering employees high-deductible healthcare plans, increasing health-insurance premiums, and including a spousal surcharge, making it inaccessible for many factory workers and/or their families [to seek care for their work-related health problems](#).

Impacts on Communities

In addition to the harm done to workers, fenceline communities are exposed to toxicants from the production of material goods. The communities located nearest to industrial factories are generally communities of color and low wealth. Fully 46% of U.S. housing projects are [within a mile of industrial factories that emit toxics](#). More than [60% of all people living in housing projects](#) in the United States are Black or Hispanic families, and all are low wealth. These marginalized groups are specifically chosen as ideal neighbors for industrial practices because it's presumed those living there [don't have the ability or resources to challenge the industry](#). [The impacts of plastic production on these communities](#) are only exacerbated by food insecurity, unequal access to healthcare, and poor education.

Working at or living near industrial factories can be particularly dangerous due to the occasional occurrence of so-called factory accidents. Fires, explosions, and chemical releases can increase the risk of exposure to toxics and force a 'shelter-in-place,' in which nearby communities must take shelter inside a room in their home with no or few windows to avoid exposure to pollutants. Unfortunately such events are not uncommon, with one plastic refinery in Louisiana reporting [more than six incidents per month](#). These incidents can also be triggered by [extreme weather events](#) which are becoming more common with the ongoing climate crisis. Fenceline communities are often further exploited as the dangers of nearby factories are withheld from them, [inhibiting them from evaluating risks and participating in decisions about harm mitigation](#).

Impacts on Individuals

While fenceline exposure increases risk for marginalized communities, all individuals are exposed to toxicity through plastic production processes and consumer practices. In addition to the acceleration of climate change caused by fossil fuel extraction to produce plastic, plastic products also find their way into homes around the world — and predictably, less privileged groups are those most harmed. Women are particularly at risk, with cosmetics and beauty products marketing specifically targeting them. A [2004 study](#) found that women are exposed to more than 100 chemicals each day (although not all plastic specific) through beauty and hygiene products and packaging. [Black, Indigenous and women of color are targeted even more](#), as many beauty and personal-care products with notably high levels of EDCs, such as hair relaxants and skin lighteners, are specifically marketed to them. While alternatives to toxic material goods exist, such as natural beauty products, they also tend to be more expensive. Thus low-income individuals are least likely to be able to afford these alternatives, exposing them to greater harm than their economically privileged peers.

The exploitation of factory workers, fenceline communities and consumers helps sustain the plastic industry. By disregarding the safety of workers and communities, factories can continue production of toxic products to maximize profit. Additionally, with more toxic products sold at cheaper costs, low-income individuals have little choice but to continue purchasing them, maintaining their exposure to harm and the demand for toxic material goods as part of market capitalism.

Case Study: Endometriosis



As the prevalence of endometriosis grows, researchers are considering potential causes. While several studies over the past two decades have shown links between phthalates and PFAS and endometriosis, results were most recently replicated in a 2018 study that showed phthalates to be a likely cause of endometriosis.

Affecting [up to 10%](#) of reproductive-aged female-bodied people, endometriosis is a common cause of infertility⁹⁰ and can lead to [severe and chronic pain](#), irregular bleeding, [disruption of one's career](#), and [interruption of social functioning](#).

Beauty products, cosmetics and personal care products are prominent sources of EDCs that are directly marketed to young women. Specifically, phthalates have been shown to contribute to growing rates of endometriosis in young women. [Phthalates are used in the soft plastics that often hold cosmetics and personal-care products](#), thus also contaminating the product that is then directly applied to the body.

Endometriosis has been shown to directly impede women's professional lives, making it less likely for them to work in their preferred profession, more likely to make health-related decisions about work, and [more likely to experience loss of productivity or require more sick leave](#) as a result of symptoms. So the effect of toxicants in plastic and other products goes beyond physical health, directly impeding the economic freedom and mobility of the women most affected.

Examples of Solutions

Ban and Regulate Chemicals

Banning toxic chemicals like BPAs, PFAS and phthalates has been challenging on the federal level, but efforts continue. In 2008 Congress banned eight phthalates commonly found in toys and children's products through the Consumer Product Safety Improvement Act. [In 2012 the FDA banned one bisphenol \(BPA\) in children's items](#), including baby bottles, sippy cups, and infant formula cans. However, BPAs, phthalates and PFAS chemicals deemed harmful tend to be replaced with alternatives that have similar properties but less research proving their danger. For example, the U.S. Food and Drug Administration recently reviewed PFOS and PFOA, which are chemicals similar to PFAS. While the FDA decided PFOA and PFOS could not be used in food packaging, [companies have substituted other PFAS chemicals for the same uses](#). Instead

of recycling the same damaging compounds, manufacturers must utilize alternatives with different chemicals that are not derived from, or composed of, harmful toxics.

The Toxics Substances Control Act, or TSCA, requires that every new chemical is assessed for safety and only approved once the manufacturer can show they are unlikely to present risk. But the system is far from perfect, and the EPA continues to approve new PFAS that have not yet been proven unharmed. Of the 400 recently approved PFAS, [less than half were tested](#) for toxicity to humans and the environment. The law also requires that the EPA review all existing chemicals, so many chemicals currently used in plastics processing are undergoing risk assessments that may restrict their use in the future. Overall banning and stricter regulation of these chemicals is an important next step.

Increase Transparency and Engagement of Risk

The EPA has attempted to increase communication between factories and fence-line residents with Local Emergency Planning Committees, or LEPCs. These committees develop an emergency response plan, review the plan at least once annually, and provide information to residents about chemicals in the community. There is [one LEPC](#) for each of the more than 3,000 designated local emergency planning districts. However, lack of funding, data, and support staff has limited the ability of LEPCs to adequately inform communities about potential hazards and instead created an [additional bureaucratic obstacle for communication](#). Until current factories are shuttered and future operations prohibited near residential towns, proper education about risks to communities are imperative.

The same is true for consumers, who may not be aware of the many toxic plastic-packaged products on the market. For example, there is currently [no federal law](#) requiring manufacturers of cleaning products to include ingredients. However, state bills that require transparency, such as California's Cleaning Product Right to Know Act, increases transparency for the whole country and motivates advocacy for federal change. Similarly, at the time of this publication, upgrades to the Personal Care Products Safety Act of 2019 are needed to increase regulations of cosmetics, requiring disclosure of toxic fragrance ingredients and [increasing safety standards for cosmetics](#). Transparency, on both federal and state levels, will increase public awareness and could inevitably limit the power of industry corporations and product manufacturers.

Increase Access to Safer Products

There are a lot of ways to avoid toxic plastic products, like using glass, aluminum, steel or porcelain containers instead. When it comes to plastic containers that hold food, particularly hot food, it's important to [avoid plastic products with recycling codes 3 or 7](#), which are often made of BPA and phthalates that can contaminate the food. People should also look to buy fragrance-free personal-care products and eat more fresh food instead of packaged food [to prevent the transmission of toxic chemicals into bodies](#). Unfortunately, these options are not equally available across socioeconomic and geographic sectors. Accessibility could improve with social policy reform that more evenly distributes wealth or corporate incentivization to lower the cost and distribution of safer items. Both social and corporate policies are needed to reduce disparities in access to safer products.

Build Reusable Systems

The prevention of waste throughout a product's lifecycle must be a policy focus. Creating less plastic waste in the first place decreases the negative impacts of fossil fuel extraction, production and distribution. One way to accomplish this is through reuse. Third-party sanitized

reuse systems should be incentivized for coffee cups, to-go containers, and other food packaging. A shift to cultural and business models that close materials loops should also be encouraged. Reusables can save businesses money and help restaurants, venues, and food-service operations cut costs. The [Break Free From Plastic movement](#) is a global initiative that advocates for reductions in single-use plastic, as well as prioritizes solutions for managing pollution from plastics. Zero-waste systems built around reuse can limit plastic production and create local jobs and supply chains to support resilient, equitable communities.

Notes About the Scope of This Paper

This paper aims to provide a brief, introductory overview of the relationship between plastic production, racial inequity, reproductive justice, and their connection to capitalism. It does not intend, nor is it able, to cover the full range of issues relevant to these complex subjects.

In the context of this paper, “capitalism” refers to market capitalist systems predicated on models of infinite growth. While the discussion of capitalism in the paper frequently references racist, sexist and classist outcomes that perpetuate reproductive injustices, it’s not the intention of this paper to collapse racism, sexism or classism into capitalism.

Gender is the behavioral, cultural or psychological traits typically associated with one sex. Gender is viewed along a continuum and includes both binary and non-binary gender identities, including LGBTQIA+. We acknowledge that all people are affected by these issues, and gender-diverse people often face additional challenges due to the lack of inclusive healthcare and other systems of oppression. Within this document we use gender-neutral terms when possible. However, since the literature to date has largely reported results in a binary way — female or male — we have retained some gendered language to accurately represent the best available research.