Scientifically What is the advantage of dismantling FDA and EPA on human health

It is a near-universal consensus in the scientific and public health communities that dismantling the Food and Drug Administration (FDA) and Environmental Protection Agency (EPA) would be severely detrimental to human health. There are no scientifically recognized advantages to human health that would outweigh the catastrophic consequences of removing regulatory oversight over drugs, medical devices, food, and the environment.

The arguments that exist for weakening or dismantling these agencies are based on reducing the burden of regulation on industries, not on improving human health.

Consequences of dismantling the FDA on human health

The FDA's primary function is to assure the safety and effectiveness of food, drugs, and medical products. Dismantling the agency would lead to an increase in unsafe products and a decrease in consumer trust.

Consequences related to food safety

- **Contaminated food supply:** The FDA sets and enforces safety standards for the nation's food supply. Without these regulations and inspections, the risk of foodborne illnesses from bacterial contamination, chemical additives, and other contaminants would rise significantly, as would outbreaks of diseases like *E. coli*.
- **Increased toxic chemicals:** The FDA regulates the use of chemical additives in food. Scientific evidence suggests that some food additives may interfere with hormones, impede development, and increase the risk of chronic diseases like obesity and diabetes. Without the FDA, companies would be free to use potentially harmful chemicals in the food supply.
- **Uncertainty of contaminants:** The FDA's "Closer to Zero" initiative actively works to reduce childhood exposure to heavy metals like arsenic, lead, and mercury in food. Dismantling the agency would halt this progress and allow unsafe levels of toxic substances to re-enter the food supply, with a disproportionate effect on vulnerable populations.

Consequences related to medicine and medical devices

- **Unsafe drugs and medical devices:** The FDA is responsible for evaluating the safety and effectiveness of all human and veterinary drugs, vaccines, and medical devices before they can be sold. Without this review process, unproven and dangerous products would reach consumers, potentially causing serious harm or death.
- **Less confidence in approved products:** The FDA's rigorous scientific review process is essential for building public trust in medicines and vaccines. The absence of this oversight would severely undermine public confidence, leading to lower vaccination rates and distrust in life-saving medical treatments.

agency would lead to increased air and water pollution, posing immediate and long-term health threats.

Consequences related to environmental pollution

- **Dirtier air:** The EPA sets and enforces limits on air pollutants from factories, vehicles, and power plants. Its work has helped prevent asthma attacks, cancer, respiratory diseases, and birth defects. Without the EPA, industrial pollution would rise, causing a significant increase in these health problems.
- **Contaminated water:** The EPA sets standards for clean drinking water to control contaminants like lead. Studies have shown that stricter lead regulations lead to significant public health benefits and economic savings by preventing negative health effects. Eliminating the EPA would jeopardize the safety of the water supply.
- **Release of toxic chemicals:** The EPA regulates chemicals that pose serious health risks. The agency's past failure to ban asbestos, for instance, has been criticized by experts. Without the EPA, there would be no mechanism to test and restrict harmful chemicals, leaving the public unprotected from their toxic effects.

Consequences related to climate change

- **Unchecked greenhouse gases:** The EPA is critical for limiting greenhouse gas emissions from various sources. Repealing its authority to regulate these emissions would worsen climate change, increasing the frequency of extreme weather events like heat waves, floods, and wildfires, all of which pose significant risks to human health.

Proposed benefits and their scientific flaws

While opponents of the FDA and EPA often frame their arguments around deregulation to spur economic growth, these arguments fail to account for the enormous public health costs that would result from deregulation.

- **Claimed benefit:** Reduced administrative costs and speedier product approvals or manufacturing.
  - **Scientific reality:** While some regulations add costs to industries, the public health and economic benefits of these agencies' work far outweigh these costs. For example, the estimated health benefits of a stricter EPA lead rule were billions more than the estimated implementation costs. The costs to society from increased illness, hospitalizations, and lost productivity would far exceed any corporate savings.
- **Claimed benefit:** Increased innovation due to fewer restrictions.
  - **Scientific reality:** As noted with the FDA, a lack of standards can actually hinder the responsible development of new products. Furthermore, industries without regulatory constraints have no scientific motivation to invest in safer, more sustainable alternatives. Without the EPA, the profit incentive would be to externalize the costs of pollution onto the public, rather than to innovate and clean up manufacturing processes.

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Before the creation of the Food and Drug Administration (FDA) and the Environmental Protection Agency (EPA), many products and practices now considered dangerous were common and unregulated. A lack of labeling, standards, and oversight led to serious public health crises that sparked outrage and legislative action.

Unsafe products before the FDA

Before the FDA was empowered with modern regulatory authority (including the Pure Food and Drugs Act of 1906 and the Food, Drug, and Cosmetic Act of 1938), food and drug products were frequently adulterated, misbranded, and contained dangerous ingredients.

- **"Swill milk" (mid-1800s):** In New York City, milk from sick, distillery-fed cows was adulterated with chalk, plaster, and other additives to whiten and thicken it. In 1858, an exposé revealed that this unsanitary product, known as "swill milk," was contributing to the deaths of thousands of infants every year.
- **"Patent medicines" (late 1800s–early 1900s):** These unregulated "cure-all" remedies often contained undisclosed and addictive ingredients.
  - **Mrs. Winslow's Soothing Syrup:** Marketed to calm teething infants, this product contained morphine and alcohol, which could lead to addiction and poisoning.
  - **Unnamed tonics:** Many such medicines were laced with high amounts of alcohol, morphine, opium, or cocaine, sold freely with no warnings.
- **Toxic cosmetics (early 1900s):** Eye makeup and skin lighteners contained poisonous substances.
  - **Lash Lure:** An eyelash dye based on coal tar caused blindness and severe injuries.
  - **Koremlu:** A hair removal cream contained thallium acetate, a rat poison, which caused paralysis and blindness.
  - **Othine:** A skin whitener contained toxic mercury, which could cause nerve damage and other serious health problems.
- **Industrial poison in candy (1930s):** Some candies sold to children during the Depression contained lead trinkets and coins embedded in them, posing a choking and poisoning risk.
- **Elixir Sulfanilamide (1937):** This untested antibiotic, formulated with diethylene glycol (a chemical related to antifreeze), caused the deaths of more than 100 people, many of them children. The tragedy led directly to the passage of the 1938 Food, Drug, and Cosmetic Act, which required pre-market safety testing for new drugs.

Unsafe products and practices before the EPA

Prior to the EPA's creation in 1970, environmental pollution from industrial and agricultural practices was widespread, with devastating consequences for human health.

- **DDT pesticide (1940s–1960s):** Before the 1972 EPA ban, the synthetic pesticide dichloro-diphenyl-trichloroethane (DDT) was widely used on crops and sprayed in communities. Rachel Carson's 1962 book *Silent Spring* revealed how DDT accumulation

- **Lead-based products (pre-1970s):** Leaded gasoline and lead paint contributed to widespread lead poisoning. The EPA, through later amendments to the Clean Air Act, drastically reduced lead in gasoline, leading to a significant drop in blood lead levels in children.
- **Toxic waste sites (mid-1900s):** Chemical companies and industries dumped toxic waste with little to no oversight, leading to contamination of land and water.
  - **Love Canal, NY:** From 1947 to 1952, a chemical company buried over 20,000 tons of chemical waste in a shallow canal. It was later covered and a school and homes were built on and near the site. In the 1970s, the chemicals began to surface, leading to an increase in birth defects and miscarriages among residents. The disaster prompted the evacuation of hundreds of families and led to the creation of the Superfund program for hazardous waste cleanup.
  - **Cuyahoga River, OH:** The river was so polluted with oily waste from industrial dumping that it caught fire multiple times. A fire in 1969 gained national attention, becoming a symbol of America's pollution problems and fueling the public outcry that led to the EPA's formation in 1970.

16 sites

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Elaborate on long-term health impacts of DDT exposure

Extensive scientific research has shown that DDT, a persistent organic pollutant (POP), has severe long-term impacts on human health, affecting multiple generations. The primary concerns stem from its nature as an endocrine-disrupting chemical (EDC) and its ability to bioaccumulate in fatty tissues over a person's lifetime. The effects are particularly dangerous during critical windows of fetal and early childhood development.

Endocrine and reproductive system

DDT and its primary breakdown product, DDE, interfere with the body's hormones, leading to reproductive and metabolic issues.

- **Breast cancer:** Studies have linked early-life DDT exposure to an increased risk of developing breast cancer decades later. For instance, one study found women with the highest blood levels of a DDT contaminant before age 14 were five times more likely to get breast cancer than those with lower levels.
- **Reproductive issues:** Exposure can increase the risk of adverse outcomes, including infertility, spontaneous abortions, and premature births.
- **Intergenerational effects:** Research shows that DDT exposure during pregnancy can affect not only the child but also subsequent generations. A 2021 study found that granddaughters of women with high DDT exposure had a higher risk of obesity and

slower metabolism in adult offspring. In mice, early exposure was shown to lower their tolerance for cold and increase their likelihood of metabolic syndrome.

- **Cardiovascular disease:** Prenatal DDT exposure has been associated with a higher risk of high blood pressure and cardiac hypertrophy (enlargement of the heart muscle) in adulthood. Studies have also linked exposure to a higher risk of heart attacks and stroke.

Neurological and immune system

The effects of DDT extend to the nervous and immune systems, especially during early developmental periods.

- **Alzheimer's disease:** Research has found an association between elevated DDE levels and an increased risk of Alzheimer's disease.
- **Impaired neurodevelopment:** In infants, high DDE levels in breast milk have been linked to prematurity. Animal studies show that developmental exposure can lead to hyperactivity and tremor-like movements later in life.
- **Inflammation:** Some studies have found that increased DDT and DDE concentrations are linked to higher levels of pro-inflammatory markers in the blood, suggesting a state of chronic inflammation.

Renal and hepatic function

DDT and its metabolites can cause damage to the kidneys and liver.

- **Chronic kidney disease:** High DDT exposure is linked to an increased risk of chronic kidney disease, particularly in adults over 40 and those with high blood pressure.
- **Liver damage:** Animal studies have shown that long-term exposure to lower doses of DDT can cause liver damage and potentially lead to liver cancer.

Key takeaway

The persistence of DDT and its ability to interfere with fundamental biological processes underscore why it is classified as a probable human carcinogen and its use is banned in many countries. Even though use is restricted, its persistence in the environment means that exposure continues, particularly through the food chain, with health consequences that can emerge decades after initial exposure and impact future generations.

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levels of DDE (the primary metabolite of DDT) in blood and an increased risk of Alzheimer's. Mechanistically, DDT exposure can disrupt brain cell function by affecting the amyloid pathway, a process implicated in AD. Research has shown that DDT exposure increases levels of the protein that forms the amyloid plaques characteristic of Alzheimer's.

- **Dementia and cognitive decline:** Beyond Alzheimer's, high DDE levels have been linked to poorer overall cognitive function in the elderly, suggesting that even non-occupational exposure can cause long-term neurological deficits. Occupational exposure to DDT has also been shown to cause cognitive dysfunction later in life.
- **Parkinson's disease (PD):** While research is still ongoing, there is evidence linking pesticide exposure, including organochlorines like DDT, to an increased risk of Parkinson's. DDT can cause neurotoxicity by damaging brain mitochondria and altering dopamine levels.

Neurodevelopmental disorders

- **Hyperactivity and behavioral changes:** Prenatal and early childhood exposure to DDT has been linked to an increased risk of hyperactivity and other behavioral issues. Animal studies confirm that early-life DDT exposure can lead to hyperactivity and tremor-like behaviors later on.
- **Altered brain activation:** Studies using neuroimaging have found that adolescents exposed to DDT during childhood showed altered brain activation patterns while performing cognitive tasks, providing a potential mechanism for the poorer cognitive function observed in these individuals.

Acute symptoms

High-level or acute exposure to DDT can cause immediate, though often temporary, nervous system effects, which were particularly common before its ban.

- **Tremors and convulsions:** Large doses of DDT can cause excitability, tremors, and seizures, as observed in historical cases of accidental poisoning.
- **Excitability and paresthesia:** DDT is a sodium channel agonist, meaning it interferes with the normal function of these channels in nerve cells. This can lead to nerve hyperexcitability, tingling sensations (paresthesia), tremors, and seizures.

Factors influencing susceptibility

The neurological impact of DDT exposure can be influenced by other factors.

- **Genetic predisposition:** The presence of certain genes, such as the *APOE ε4* allele, appears to increase an individual's susceptibility to the neurological damage from DDE, increasing the risk for Alzheimer's.
- **Timing of exposure:** Exposure during critical windows of neurodevelopment, such as during fetal development and early childhood, appears to be particularly harmful, as the developing nervous system is more vulnerable to disruption.

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