

University of Washington Tacoma

## UW Tacoma Digital Commons

---

Global Honors Theses

Global Honors Program

---

Spring 6-4-2021

# The Dangers of Fast Fashion: A Health and Environmental Analysis

Summer Roslyn Turnberg

*University of Washington - Tacoma Campus, turnbs@uw.edu*

Follow this and additional works at: [https://digitalcommons.tacoma.uw.edu/gh\\_theses](https://digitalcommons.tacoma.uw.edu/gh_theses)



Part of the [Environmental Sciences Commons](#), [Life Sciences Commons](#), [Medicine and Health Sciences Commons](#), and the [Psychology Commons](#)

---

### Recommended Citation

Turnberg, Summer Roslyn, "The Dangers of Fast Fashion: A Health and Environmental Analysis" (2021). *Global Honors Theses*. 79.

[https://digitalcommons.tacoma.uw.edu/gh\\_theses/79](https://digitalcommons.tacoma.uw.edu/gh_theses/79)

This Undergraduate Thesis is brought to you for free and open access by the Global Honors Program at UW Tacoma Digital Commons. It has been accepted for inclusion in Global Honors Theses by an authorized administrator of UW Tacoma Digital Commons.

The Dangers of Fast Fashion: A Health and Environmental Analysis

Summer Turnberg

Biomedical Sciences

Faculty Advisor: Dr. Jutta Heller

June 2021

Essay completed in partial fulfillment of the requirements for graduation with Global Honors,  
University of Washington, Tacoma.

The Dangers of Fast Fashion: A Health and Environmental Analysis

Summer Turnberg

Biomedical Sciences

June 2021

Faculty Advisor: Dr. Jutta Heller

Essay completed in partial fulfillment of the requirements for graduation with Global Honors,  
University of Washington, Tacoma.

Approved:



\_\_\_\_\_

\_\_06/04/21\_\_

Faculty Advisor

Date



\_\_\_\_\_

\_\_7/8/21\_\_

Associate Vice Chancellor, IIGE

Date

## Table of Contents

The Dangers of Fast Fashion: A Health and Environmental Analysis .....	1
Abstract .....	1
Introduction.....	1
Background .....	3
Global Interdependence and Globalization.....	5
Health Concerns.....	7
Environmental Concerns.....	12
Economic Impact .....	17
Future Model.....	19
Conclusion .....	22
References.....	24

## The Dangers of Fast Fashion: A Health and Environmental Analysis

### **Abstract**

The purpose of this thesis is to explore the alternatives for fast fashion, the global interdependence between areas of production and areas of consumption for fast fashion, and the long-term health and environmental risks associated with fast fashion production and consumption. This paper aims to discover what health effects are proven to be associated with fast fashion production, the causes of health effects, and the steps which manufacturers, shoppers, fashion companies, and those producing the clothing can take to better the fast fashion interdependency and operations. This study will first delve into the global interdependencies of fast fashion and the structures that are in place, mainly from an economic standpoint. It will then describe the methods used for fast fashion and discuss the various processes necessary for clothing production and sales to high clothing demand areas. It will then describe the methods used for fast fashion and discuss the various necessary clothing production and sales processes to high clothing demand areas. Health harms and the threats globalization pose will be compared. Relevant health data for illnesses and diseases related to fast fashion production will be presented, followed by environmental studies and their impact on human health. Lastly, an alternative and prototype proposal will be explored to increase awareness among consumers with psychological consideration for its effectiveness.

### **Introduction**

Modern fashion, as individuals in developed nations recognize it, is dependent on outsourced work. Through the demand for fast fashion, citizens of affluent countries and the companies that cater to them create pressure for clothing items to be immediately created after

gaining popularity. In the process to meet the needs of that demand, workers' health and the environment are compromised. By definition, fast fashion is: "an approach to the design, creation, and marketing of clothing fashions that emphasizes making fashion trends quickly and cheaply available to consumers" (Merriam-Webster n.d). Fast fashion brands can be easily spotted by the price tag on clothing and the wide variety of clothing offered. Fast fashion companies often have thousands of fashionably relevant articles of clothing available for purchase at any given time to large consumer demographics.

With high demand and low usage, fast fashion has become a prominent player in globalization and economic gain. It also has health and environmental impacts in production areas. This essay aims to highlight the globalization which occurs from fast fashion and critique the systems of globalization being used on the basis of global health from the preexisting health data available. Traditionally, the terms 'first world' and 'third world' countries have been used to describe the areas of consumption and the areas of production; however, in this essay the terms 'areas of influence' and 'areas of production' will be used to differentiate the predominant roles within the industry of fast fashion. This solution-based essay will provide a theoretical prototype for clothing tags to increase consumer awareness and help combat the injustices caused by outsourced textile manufacturing. The medical studies referenced within this essay are taken from a wide variety of countries; however, the practices used in the fast fashion industry are broadly uniform across all manufacturing sites. Essentially, although the data is taken from different areas, the practices to produce fast fashion are primarily the same, independent of location. It is critical to acknowledge that the current medical data uses the terms 'male' and 'female' to identify those born with testes or

ovaries, respectively. The data does not take into account transgender or gender non-conforming individuals.

### **Background**

Countries that hold a high demand for fast fashion such as the United States, the United Kingdom, and Canada primarily outsource their labor. Outsourced labor is common in areas with growing economic influence, with most of this labor coming from areas such as Indonesia, Vietnam, and Cambodia. In total, the clothing that is seen in the stores in areas of influence is the combined work of approximately 150 countries (FASH455 Global Apparel & Textile Trade and Sourcing n.d). While textile production still occurs in areas of influence, the scale is much smaller. For the United States in particular, textile employment is extremely low. By 2017, there were only ten areas in the United States responsible for textile production (National Occupational Employment and Wage Estimates 2017). Tags that say ‘made in the USA’ do not necessarily tell their entire origin story. Tags can claim “Made in the USA” if the articles are put together in the USA, but it is not rare for these articles to be partially made with outsourced labor, then sent to the USA for the final stages of production (FASH455 Global Apparel & Textile Trade and Sourcing n.d). These unclear messages are likely to confuse consumers and give them the false confidence that they bought clothing produced under U.S working conditions, standards, and pay. Unclear messages given to consumers make it easier for companies selling fast fashion to benefit from low prices while avoiding scrutiny and concern from the consumer.

In order to effectively produce fast fashion, a practice called wet textile processing is commonly used to produce the desired article of clothing. Wet textile processing requires a large

amount of water, dyes, chemicals, and various materials for fashion production, mainly in the areas of dyeing, printing, and finishing of clothing. The first stage of wet textile processing is pretreatment, which uses many chemicals to prepare the material to better respond to the dyes and processes that follow. The next stage is dyeing or printing, making the articles of clothing largely recognizable and attractive to the purchaser. Lastly, there is finishing, where clothes are given treatment to make sure their appearance matches the fashion companies request. (Textile Wet Processing—An Overview n.d). Along with the wet processing steps, textile manufacturing also includes spinning, scouring, and shredding of materials which lends itself to synthetic fiber exposure for workers within these stages of clothing production. The weaving segment of textile production also includes warping and sizing. Across weaving, warping, and sizing, yarn is being shifted, pulled from its packaging cone, and treated with a protective coating (Textile Infomedia 2020). Wet textile manufacturing and the processes associated with it are responsible for environmental and health harm.

Putting these processes together, the end product is created: an article of clothing that can be sold to a consumer base largely unaware of the clothing process. This system has thrived economically since 1947 when the first brick-and-mortar H&M store was established. H&M would soon grow to be one of the most prominent players in the fast fashion empire (What Is Fast Fashion? 2020). In the post-World War II era, the early European clothing companies began to shift from limited, locally sourced clothing to an attractive variety of clothing that was lower in cost and further outsourced. Currently, the top names in fast fashion are H&M, Zara, GAP, Topshop, Primark, Forever 21, Zaful, and Fashion Nova (What Is Fast Fashion? 2020).



### **Global Interdependence and Globalization**

Fast fashion has grown since the creation of H&M in 1947, becoming a huge factor in global economics. The process of globalization and interest in fast fashion begins with the consumer who is attracted by affordable prices and a desire for the most relevant trends. This serves as a luxury to those in areas who consume high amounts of fast fashion as they are able to go about life without seeing the textile factories which create the clothing worn. Another privilege of solely consuming fast fashion rather than producing it or living in an area of production is the preservation of the physical environment within the community. These benefits are not solely for the consumer. Outsourced labor is also desirable to the companies which are the driving force of fast fashion due to different workplace standards and the ability to cut corners in workplace safety and underpay employees. The need of outsourced labor by the companies creates manufacturing sites in countries which have a need for additional labor opportunities and can abide by the minimal economic allowance the companies are willing to pay. As a consequence of these demands, the offer of work, regardless of the hazardous practices that might be employed, is attractive to individuals in the areas of production, particularly young women and low-income mothers looking to provide for their children. In the model of globalization for the case of textile production, the degree of influence and the relation to degradation and health effects have an inverse relationship. This relationship can best be visualized as a pyramid with the most privileged parties at the peak. In this model, the top of the pyramid of influence are the fast-fashion consumers, followed by the clothing brands and companies, then the outsourced factories/manufacturing sites. Lastly, at the bottom of the pyramid lies the textile factory workers.

The individuals on either side of the chain of demand cannot be solely to blame for the empire that fast fashion has created, but they represent two opposite ends of a pyramid of demand fueled by companies and manufacturers. The interdependence within these relationships lends itself to the theory of globalization.

Globalization is an occurrence where there is dependence beyond borders and often has a solid economic tie. Global trade is not necessarily indicative of globalization, however, when an interdependence between nations begins to form, the process of globalization occurs. The financial ties that bridge areas of influence and areas of production uphold the traditional understanding and application of the theory of globalization. Globalization is not inherently a negative occurrence on the surface level, but globalization can be environmentally, medically, and economically hazardous upon consideration of the human condition. The roots of problems deeply engrain themselves into society; with strong economic ties, solutions to help the human condition can be disruptive to society. In the case of fast fashion, the threat to workers' health can easily be overlooked in the grand economic scheme of production and profit. Similarly, the environment is threatened due to the standards in place for global textile production, which also threaten human health, yet these threats are also highly overlooked.

Fast fashion fits into the mold of globalization due to the interdependence between those who consume and those who produce. Further, fast fashion follows the theory of globalization due to the fact that there is a prevalent disadvantage to one party due to the dependence on another.

The environmental and health challenges addressed in this essay align with the model of globalization currently presented. To put it simply, those who produce fast fashion and are at the bottom of the hierarchy of demand face negative consequences such as bladder cancer and

Chronic Obstructive Pulmonary Disease (COPD) as well as the rising challenges of environmental degradation in their own areas. This system can complicate health conditions obtained from textile manufacturing and processing. It is essential to understand that global interdependence is a sensitive relationship to make changes to; however, it is in the best interest of all humans globally to take any steps necessary to reduce the dependency. To combat the sensitive state of the economic ties to fast fashion globalization, the actions taken now must be respectful to the current means of production yet offer an alternative for change and growth in the future. The proposal of more informative clothing tags does not immediately affect the globalization in place, but it provides the consumer at the top of the pyramid of interdependence more information about their clothing and provides them a platform for independent research into the origin of the materials used. Consumers who are informed of their direct role in the fast fashion model are challenged to change their practices and support more sustainable alternatives to protect those at the bottom of the pyramid of globalization. Changing the means of operations and the effect of globalization is a long-term goal, but actions can be taken along the pyramid of demand to make positive change for those most affected by the global interdependence of fast fashion.

### **Health Concerns**

The workplace standards which individuals are subject to in these occupations are not suitable for human wellbeing and condition. Health concerns largely stem from the exposure to wet textile processing and the processes within the shredding/synthetic fiber association within the fast fashion factory. Dyes are also a common cause of adverse health effects; 40% of the dyes used in clothing contain organically bound chlorine, a known carcinogen (Khan, S., &

Malik, A. 2014). The following studies aid in the understanding of the hazards of fast fashion. It is important to note that this is a growing area of research along with the environmental health research tied to fast fashion.

A 2007 study of Spanish textile workers located in Vallés/Bages, Barcelona, Asturias, Elche, and Tenerife found a positive increase in bladder cancer among individuals who work in specific subsections of textile production. In this study, odds ratios (OR) and confidence levels (CL) are determined from the data collected. Confidence levels are typically determined significant when they are .95 (95%) or higher. The OR is determined by comparing data of those not exposed to textile manufacturing and those who were exposed to textile manufacturing, all with the given health concern. An OR of 1 would be indicative of no correlation, whereas an OR of 0.5 would suggest the health effect is half as likely with the given exposure and an OR of 2 would suggest that the health effect is two times more likely with the given exposure. These measurements of the health statistics are vital to ensuring the data is significant and conclusions can be drawn from it.

The areas where bladder cancer was most prevalent were among weavers (OR=1.82, n=95% CL 0.95 to 3.47), and workers in winding, warping, and sizing positions of fast fashion work (OR 4.11, n=95% CL 1.58 to 10.71). More exposure to the hazards caused within these positions increased the likelihood of bladder cancer within these individuals (Serra et al. 2008). Further, workers with ten years or greater exposure to these same areas of textile work had an increased likelihood of bladder cancer (Serra et al. 2008). Bladder cancer is exceptionally abundant in textile workers and is the most studied cancer association to fast fashion (Serra et al. 2008). Bladder cancer is relatively easy for individuals to detect. The first symptom is usually blood in the urine, followed by increased urination, pain during urination, and a weak urine

stream (Bladder Cancer Signs and Symptoms n.d). Though bladder cancer is highly recognizable and can lend itself to early detection, globally, it is among the 10 most deadly forms of cancer (Saginala et al. 2020). With more of a demand for individuals to work these textile jobs and mass-produce clothing, the amount of people being exposed to these conditions increases. With this, more people are exposed to the hazardous conditions of this employment.

Material exposures due to textile production can cause not only cancers but also severe lung illnesses and increase the risk of other diseases. Obstructive Lung Disease has a positive correlation with textile workers and threatens serious consequences. These consequences include asthma and chronic obstructive pulmonary disease (COPD), an umbrella term for a group of diseases that cause airflow blockage and breathing-related problems (Obstructive Pulmonary Disease 2021). A study conducted in the United States followed 13 textile workers who reported symptoms of byssinosis, the narrowing of airways caused by inhaling cotton and other textile materials. Of these 13 participants, 12 had FEV<sub>1</sub> (a test for the amount of air able to be expelled out of the lungs) ranging from 17-58% and little to no bronchodilator response which is indicative of COPD (Lai et al 2013). To put this into perspective, an FEV<sub>1</sub> reading from a healthy individual ranges between 80-120% (An Approach to Interpreting Spirometry n.d). Other than the United States study, many studies for COPD considering fast fashion do not include necessary parameters which include a post-bronchodilator FEV<sub>1</sub>/FVC ratio less than or equal to 0.7 or 70%. A FEV<sub>1</sub>/FVC less than or equal to 70% is indicative of COPD, asthma, and/or bronchiolitis (Leader n.d.). Studies including the FEV<sub>1</sub>/FVC ratio are needed for further analysis into the severity of COPD experienced by textile workers in future research (Lai et al. 2013).

Those who work in the fast fashion industry have increased exposure to endotoxins due to the synthetic fibers in the air (Wernli et al. 2008). Endotoxins are toxins within bacteria that

are readily hosted on synthetic fibers and are mainly exposed in the shredding of materials. Endotoxins have a negative association with lung cancer and have decreased the amount of lung cancer observed in textile workers. A study of textile workers in Shanghai, China showed an inverse relationship between endotoxin exposure and lung cancer, further proving the cancer prevention benefits of endotoxins (Wernli et al.2008). Though endotoxins do aid in cancer, hay fever, and allergy prevention, they still pose a hazard to human health. Exposure to endotoxins is significantly associated with cough symptoms, shortness of breath, and wheezing (Farokhi et al., 2018). These symptoms should not be overlooked, as they can worsen preexisting conditions in workers.

Building upon the known hazardous effects on health dependent on synthetic fibers in the air, studies have begun looking for ‘byssinosis bodies’ from the autopsies of individuals who worked in textile manufacturing. The data so far is limited to a study done in Japan, however, the methods used are promising and offer a great need for follow up with more deceased individuals who have been employed by textile manufacturers.

Byssinosis bodies are stringy foreign objects consistent with cotton fibers found within pathologic exams (Lai et al 2013). These byssinosis bodies are incredibly concerning when considering the vast amount of time textile workers spend exposed to cotton fibers in the air. Proper ventilation and personal protection equipment (PPE) such as masks are vital to protecting workers’ health from the hazardous conditions of manufacturing sites. The air conditions within these factories can be extremely dangerous. Unfortunately, with limited additional funding being supplied to areas of global textile manufacturing, Personal Protective Equipment (PPE) is not a priority and therefore it is not guaranteed that workers can protect their health. Future research

on the lungs of textile workers should be considered to help aid in awareness and prevention of severe health effects on workers in similar conditions.

Neglect and lack of care for the manufacturing sites also threaten the health of fast fashion workers. Many historical industrial accidents have been due to textile manufacturing ranging from the Triangle Shirtwaist factory fire of 1911 to the building collapse at Rana Plaza in Bangladesh in 2013. In the case of the Triangle Shirtwaist factory, legislation was created to protect factory workers, driving labor costs to maintain the standards to keep workers safe. In the Rana Plaza Dhaka Garment Factory, workers were requesting examination of the building's integrity far before the collapse (Hobson 2013). The Rana Plaza incident ended up taking 1,135 lives and injured 2,500 individuals (The Rana Plaza Accident and Its Aftermath 2017).

Unfortunately, lack of structural integrity is not novel to the Rana Plaza case. Textile factory fires are also a considerable threat to workers' safety and health. The Rana Plaza tragedy was not a novel occurrence. Only five months prior to the Rana Plaza incident, the Tazreen Fashions Factory outside of Dhaka lost the lives of 112 workers due from being trapped inside the burning factory (Hobson 2013). These incidents raise concern for workers to be able to protect themselves from the threat of a building collapse or fire. The standard that the factories are held to pose a significant threat on workers' health and wellbeing and must be taken into consideration, along with the clinical health concerns posed by global textile manufacturing and production.

The abundance of health concerns tied to textile production suggests that there is physical harm associated with the demands placed on the textile market by consumers within areas of influence. Those who are subjected to the most health threats are those who are least in control of the current model of fast fashion. It is the responsibility of those who consume these textiles to

demand more care for these workers by the companies and manufacturing lines. It is imperative that the awareness begins as soon as possible to reduce the amount of exposure and the production rate within these factories.

These are the direct effects from exposure within the walls of textile factories and from the physical structure of these workplaces. The standards that countries of influence uphold for their workers are not reflected in the countries of production, leading to a global health crisis. This does not just end with the clinical data and fatalities from neglect in maintaining manufacturing sites. There are additional threats to human health from environmental neglect.

### **Environmental Concerns**

Visually, the areas surrounding global textile production are seen to be affected by textile production demand. Emissions produced by factories create local smog pollution. The water is also impacted. One of the most common environmental degradations is of natural bodies of water surrounding the areas of fast fashion production. 'Hydrocide' is the term coined for the phenomenon where bodies of water will be dyed the color associated with the upcoming season of fashion (Webber 2019).





Figure 1. Hydrocide nearby a fast fashion factory located within China. A red dye is leaking from the clothing and the clothing itself is polluting the shore (Webber 2019).

Hydrocides, as seen in figure 1, are caused by the wet textile processing. The pollutants which cause hydrocides can be dyes that directly threaten the health of individuals, or compounds which lead to water degradation and aid in the process for hazardous algal blooms and groundwater contamination. Beside the effects of simply adding more waste to the water, each article of clothing has pollutants in it.

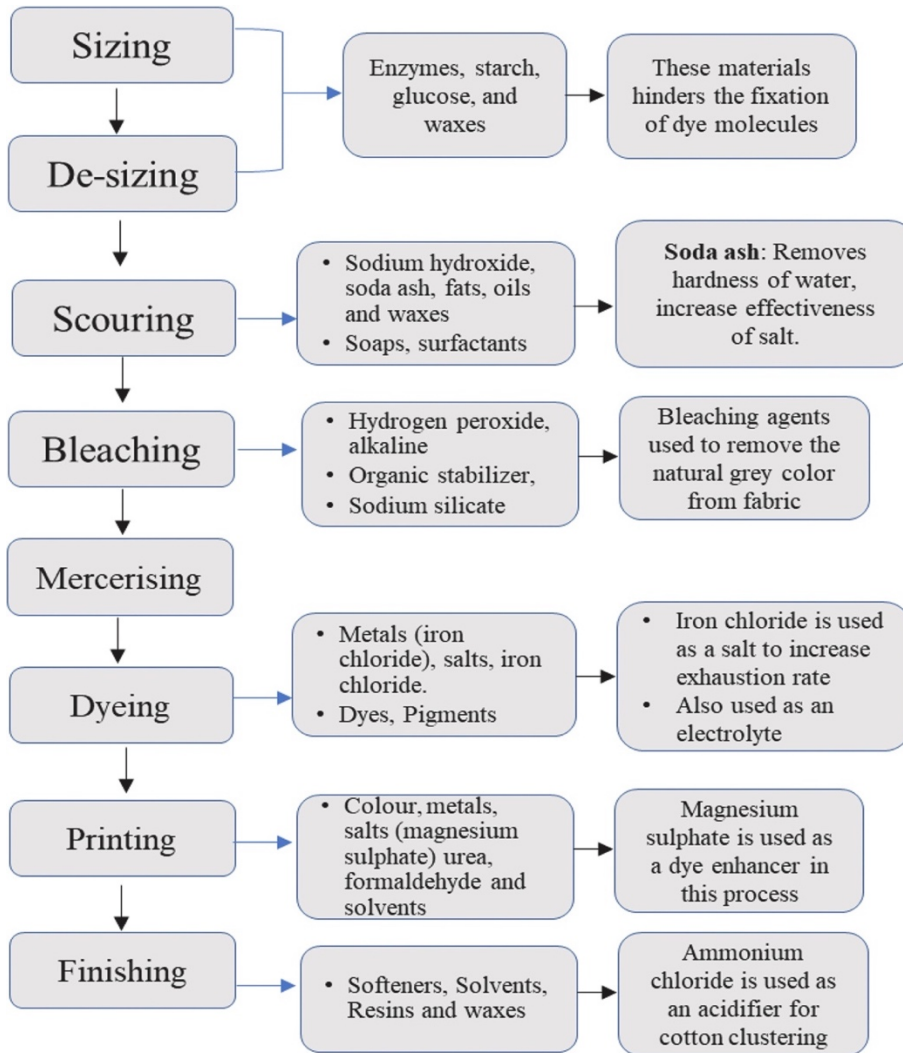


Figure 2. Common pollutants of wet textile processing (Denchak 2018)

The processes outlined in figure 2 are used across fast fashion manufacturing companies. Any of these common pollutants are likely to be exposed into the water causing the hydrocide (Fig. 1). Soda ash is a common additive in water to remove calcium and magnesium, reducing the hardness. While the process is beneficial for textile production and the average household, the delicate ecosystems of water can lose vital nutrients required for aquatic life. Bleaching agents in water act as toxins for aquatic life and degrade carbon-carbon double bonds which are vital to organic life (Bleaching Agent n.d). Iron chloride (ferric acid) creates long term

complications for aquatic life and decreases reproduction rates (Cadmus et al 2018). This heavily impacts the ecosystems necessary for aquatic health to thrive. Magnesium impacts the sensitive pH of water and increases alkalinity (Department for Environment F and RA n.d). Ammonium in the water is detrimental to aquatic life and leads to a toxic buildup in their internal tissues and blood (US EPA O 2015). Putting all the pollutants together, the health of the water is heavily put at risk due to the demands of fast fashion and the wet textile practices needed to fulfill those requests.

Water pollution is hugely detrimental to human health and disproportionately impacts low-income communities (Denchak 2018). Every year, 1.8 million people die from unsafe water standards, and 1 billion people become sick due to global water pollution (Denchak 2018). The chemicals may also participate in redox reactions that reduce the water's oxygen levels, known as eutrophication (Denchak 2018). Areas of eutrophication eliminate necessary aquatic ecosystems and increase the likelihood of neurotoxins and algal blooms present in bodies of water (Denchak 2018).

On top of this, 1.712 million tons of carbon dioxide are produced each year from textile production alone, threatening the health of the communities of fast fashion production and global efforts to reduce carbon dioxide emissions (How Fast Fashion Causes Environmental Poverty 2020). Increased carbon dioxide emissions not only threaten the areas of fast fashion production but the entire world. Carbon dioxide is detrimental to the ozone and contributes to climate change which impacts human health, including but not limited to respiratory allergies and disease, cancer, cardiovascular disease, stroke, mental health, and weather-related morbidity and mortality (Portier et al. 2010; Fig. 3).

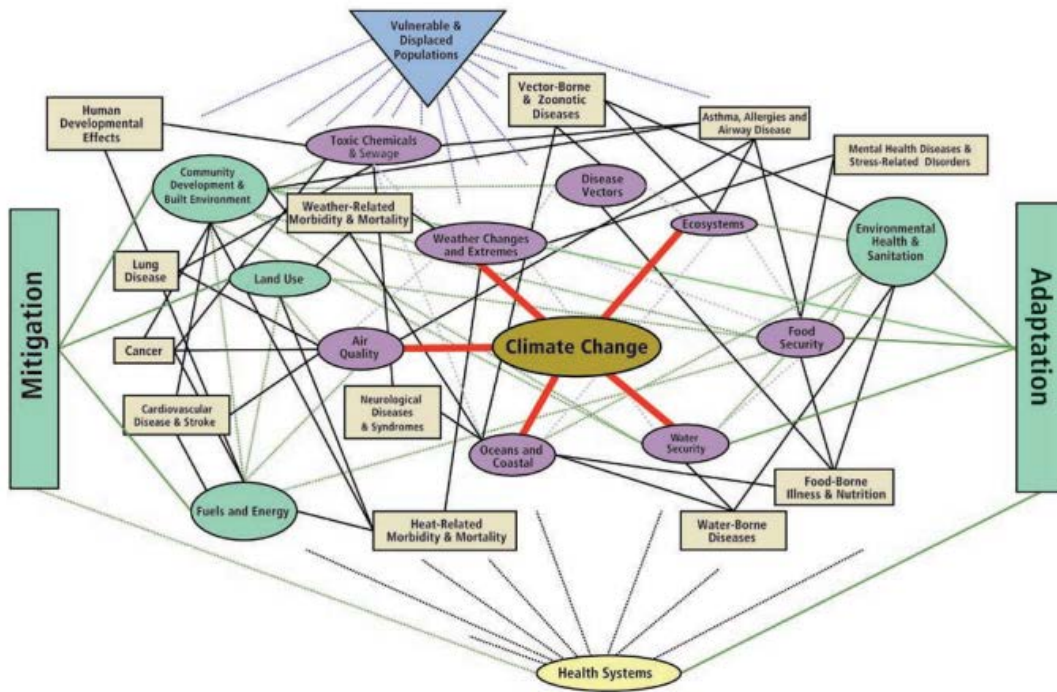


Figure 3. Various ways climate change impacts human health and quality of life (Portier et al. 2010).

Environmental decay poses an imminent threat via climate change. The climate is a resource which the entire world uses and therefore the effects will be seen within every cultural and in every area on the planet. This expands the hazards to those purchasing fast fashion as they are faced with the same consequences as those who produce including but not limited to decreased air quality, lung diseases, cancer, decreased food security, and weather changes and extremes (Portier et al. 2010).

Considering the effects of climate change and the impacts on human health and quality of life, along with the direct health correlations of fast fashion, there is a great health disadvantage globally, with a heavy emphasis on those who work hazardous textile jobs. Having a preexisting condition caused by textile work makes the morbidity and mortality threat from environmental degradation a global challenge which ethically must be addressed. On top of this, low-income

individuals are at a higher disadvantage to illness, and accessing healthcare is a greater burden. The economic impacts of fast fashion are such that textile workers in areas of production have wages below the average income of the respective country (Lu 2020; Figure 4). The amount of demand coming from areas of influence only puts more pressure on manufacturers to hire a greater number of employees, therefore exposing them to unsafe working conditions and creating a significant threat to global wellbeing and environmental health by emitting even more carbon dioxide. Those in areas of privilege which do not have hydrocides, algal blooms, or increased effects of abundant carbon dioxide emissions potentially will not be aware of or consider these effects. Though consumers may not actively see environmental degradation in their daily life currently, their choices today are affecting their environment, health, and wellbeing in the future. A consumer may hold a degree of cognitive dissonance between their daily life and the damage currently caused by the manufacture of fast fashion. Informing those who consume fast fashion about their impact and what they are truly contributing to is the initial step to changing the current system.

### **Economic Impact**

Fast fashion is attractive because of the ability to pay employees less than what the government would require workers to be paid in countries of influence. Belgium, the country with the highest paid fast textile workers is underutilized in global fashion whereas China is the largest producer of fast fashion and is heavily utilized due to the cheap labor practices with monthly pay being equivalent to \$270 United States Dollars (Lu 2020).

Though awareness for fast fashion is rising, the revenue is still growing. The predicted amount of revenue for fast fashion in the United States alone is \$36 billion (Fast fashion market

value forecast worldwide 2009-2029 n.d). Disrupting the dependable income for fast fashion can be detrimental to the United States economy and the other countries of influence. In perspective for the areas of production, Inditex, a large multinational fast fashion production company, reported their revenue for the 2019 fiscal year was €28.2 billion or approximately \$33.9 billion USD (United States Dollars). The consumers in areas of influence fuel the powerful textile market. According to a 2019 report from Dana Thomas of the Wallstreet Journal, the average American purchases 68 articles of clothing per year. The price widely varies based on the specific articles of clothing and would be dependent from person to person, however, the sheer amount of clothing purchased shows a disconnect the consumers have from the reality of what they are buying. These articles of clothing are likely purchased for convience, quick fashion trends, their cheap price, or any combination of those factors. Lastly, the wages of the textile employees must also be considered in an effort to grasp the full economic scale fast fashion holds (Fig. 4).

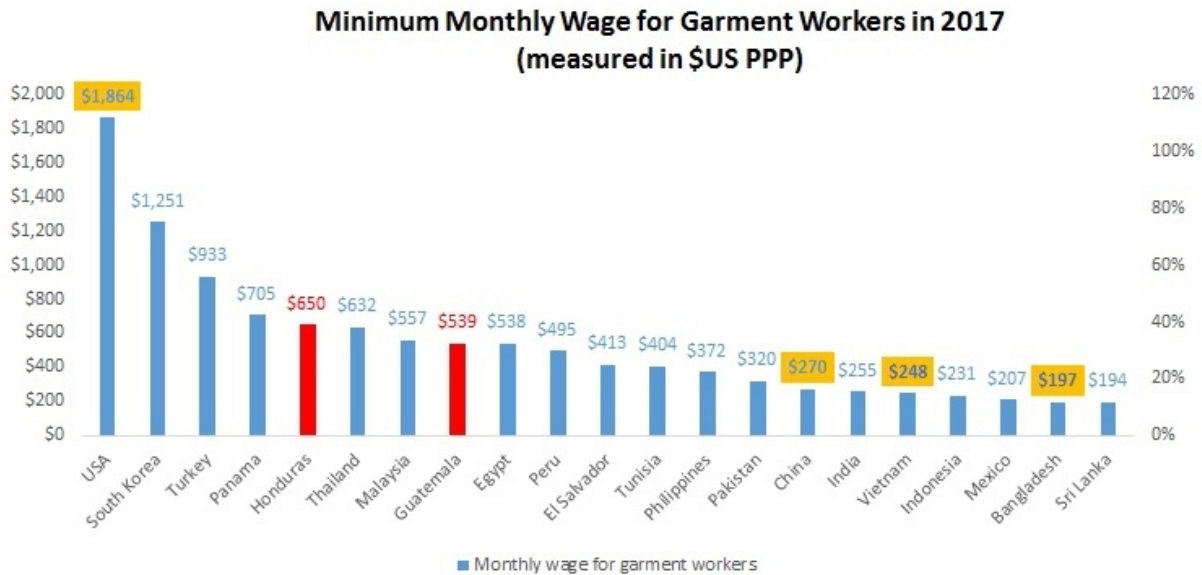


Figure 4. Monthly wage across 20 countries of fast fashion production. Countries in red are indicative of wages higher than the national average wage, respectively (Lu 2020).

The minimum wage that must be given to a worker in the United States where fast fashion is regularly consumed, is nearly 7 times the wage of a worker in China, an area where fast fashion is regularly produced. In other countries which often supply fast fashion, such as Bangladesh, the wage difference is even greater (Fig. 4). Employing workers who will produce articles of clothing for a cheap price is the most efficient way to keep prices down to still be attractive to consumers residing within areas of influence. Due to this, fast fashion has become an empire and a large area of global financial dependence.

An abrupt change in the current economic model would not only disrupt the global economy but create a stark shift in the global interdependencies upheld by the fast fashion model of today. Considering this, the solution proposed must be hypervigilant of the delicacy of this system and create an opportunity to shift towards more equitable clothing practices. A stark change in economics is likely to impact every individual at every level in the hierarchy of fast fashion.

### **Future Model**

Consumers must be knowledgeable about the problems and consequences associated with their behaviors for change to occur. Campaigns help inform specific demographics about the consequences of their fashion consumption, but there is only one way for all fashion consumers to see the impact of the clothing they buy: putting the information directly on the product. In the United States, the standards for the country-of-origin tag must identify the country where the products were processed or manufactured: products made in the USA must have “Made in the

USA”, and products where work was partially outsourced and partially made in the USA must label both countries (Through Threading Your Way Through the Labeling Requirements Under the Textile and Wool Acts 2014). The current policies allow consumers to be somewhat aware of the origin of their clothing. However, many consumers either never look at that tag or do not notice it and therefore do not draw connections to what they may hear about environmental degradation, health hazards, or unsafe workplace standards. I propose a new standard for the clothing tag, which includes the country of origin, the town of origin, and the country’s flag in which production took place.

In a psychological study on arousal and cognition, participants exposed to color over black and white had an information retention rate that was 40% more likely in short-term memory (Farley 1976). Short-term memory lasts 15-30 seconds on average (Weinstein 2017). While there was no correlation in this study behind memory retention regarding color vs. black and white text in the long-term memory, the decision between two articles of clothing for an individual is certainly well within the 15-30 second limit. With the color alone, short term, consumers will be more likely to recall the presence of a flag due to the colors presented. The iconography of the flag also serves as a feature to help in the memorization and recognition of where the clothing is from. Along with this, the specific area within the country of origin listed within the tag can serve to show the vast number of areas these companies are using for their labor and serve to house awareness for news of abuse to the environment or workers within that area. Companies such as H&M would have to be more specific about how their manufacturing is being outsourced rather than their current generalized claim that they use 800 different factories. From those thousands of articles of clothing offered, consumers would be able to tell the sheer amount of globalization they are aiding by simply looking for their clothing size. The goal of this



is to nudge the consumer to truly consider the global empires they are supporting when they are making their fashion choices and realize the impact they may be having on global economy, health, economics, and the environment.



Figure 5. Misleading clothing tag with American flag but a country-of-origin China (Will the fashion industry survive being hit by Trumps tariffs 2018).

Legislation to ensure clothing tags are accurate is vital to upkeeping this prototype. Some tags include the country of origin's flag; however, without proper rules set in place, they can be highly misleading (Fig. 5). To the quick glancing eye, it seems as though this product was created within the United States. The country of origin, which is required, is stated below the flag in the smallest text on the tag. Someone seeking to purchase this article of clothing could easily be drawn to the American flag and not read that the product is actually made in China. That consumer when they are making their quick decision on their article of clothing to purchase

believes that they are supporting fair wages, somewhat local economy, and U.S standard workplace practices, however, this is far from the truth. Ensuring that clear boundaries are set when legislation to be changed is essential to supporting consumer awareness.

Awareness is a powerful tool and a catalyst for the fast-fashion problem to be solved. With the interdependence and chain of command of fast fashion, consumers are at the forefront of decision-making and can promote better world health- they just need to be aware of their impact on it. With a change in the policy of the requirements to keep consumers in the know about their products, those in high demand areas are put in the position to advocate for global health justice and workplace standards. Companies who depend on the consumers will be forced into a position where they must abide by the wishes of the consumer, demanding that manufacturing sites increase their employee protection.

Some consumers may decide to completely shift from fast fashion which will lead to a decrease in demand. Some individuals may still support fast fashion but purchase less, which too will decrease the demand. Lastly, some may not change their practices and they will keep the market in place. All types of consumers play an important role in the shift from fast fashion while still protecting the global economy.

### **Conclusion**

The global textile factory workers' health and wellbeing are dependent upon those at the top of the pyramid of influence. With proper awareness of where clothing comes from and the practices behind it, those who purchase fast fashion have the ability to demand more from the clothing companies they financially support. Though health and environmental degradation is not seen by those who consume fast fashion, the threats associated with them are guaranteed to

impact the rest of the world with robust carbon dioxide emissions and water pollution. Short term, the best way to slow the health hazards directly threatening textile workers is to employ a 'think before you buy' mindset and try to loosen the chain of command for fast fashion. Change can be made when the average person tries to repair clothing that has deteriorated over time or shop second hand before buying new.

'Slow fashion' brands are also rising in popularity, creating more expensive but longer-lasting products with environmental and fair labor concerns in mind. A popular example of a slow fashion company is Patagonia which many people who oppose fast fashion practices consume. Slow fashion brands still cater to the consumer market, but their more expensive clothing is meant to last longer for the consumer, there dubbing the title 'slow fashion'.

Regardless of the steps each individual takes after awareness of fast fashion, the initial awareness is fundamental and must reach as wide of a population as possible. The fast fashion industry and its related hazards can be decreased from this awareness and pressure on the consumers end, ultimately slowing the system of globalization in place.

## References

- An Approach to Interpreting Spirometry - American Family Physician. [accessed 2021 May 7]. <https://www.aafp.org/afp/2004/0301/p1107.html>.
- Bladder Cancer Signs and Symptoms. [accessed 2021 Apr 20]. <https://www.cancer.org/cancer/bladder-cancer/detection-diagnosis-staging/signs-and-symptoms.html>.
- Bleaching Agent - an overview | ScienceDirect Topics. [accessed 2021 May 7]. <https://www-sciencedirect-com.offcampus.lib.washington.edu/topics/earth-and-planetary-sciences/bleaching-agent>.
- Cadmus P, Brinkman SF, May MK. Chronic Toxicity of Ferric Iron for North American Aquatic Organisms: Derivation of a Chronic Water Quality Criterion Using Single Species and Mesocosm Data. Archives of Environmental Contamination and Toxicology. 2018 Jan 22 [accessed 2021 Jun 2]. <https://link.springer.com/article/10.1007/s00244-018-0505-2>
- Chronic Obstructive Pulmonary Disease (COPD) | CDC. 2021 Feb 22. [accessed 2021 Apr 23]. <https://www.cdc.gov/copd/index.html>.
- Department for Environment Food and Rural Affairs (Defra) webmaster@defra.gov.uk. Pollutant information - Defra, UK. [accessed 2021 May 7]. [https://naei.beis.gov.uk/overview/pollutants?pollutant\\_id=117](https://naei.beis.gov.uk/overview/pollutants?pollutant_id=117).
- Denchak, Melissa. 2018. Water Pollution: Everything You Need to Know. NRDC. [accessed 2021 Apr 20]. <https://www.nrdc.org/stories/water-pollution-everything-you-need-know>.
- Farley FH, Grant AP. 1976. Arousal and cognition: Memory for color “versus” black and white multimedia presentation. Journal of Psychology. 94(1):147–150.
- FASH455 Global Apparel & Textile Trade and Sourcing. FASH455 Global Apparel & Textile Trade and Sourcing. [accessed 2021 Apr 20]. <https://shenglufashion.com/>.
- Fast fashion market value forecast worldwide 2009-2029. Statista. [accessed 2021 Apr 22]. <http://www.statista.com/statistics/1008241/fast-fashion-market-value-forecast-worldwide/>.
- Farokhi A, Heederik D, Smit LAM. Respiratory health effects of exposure to low levels of airborne endotoxin - a systematic review. Environmental health : a global access science source. 2018 Feb 8 [accessed 2021 Jun 3]. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5806377/>

- Hobson J. To die for? The health and safety of fast fashion. *Occupational medicine* (Oxford, England). [accessed 2021 Jun 2]. <https://pubmed.ncbi.nlm.nih.gov/23837074/>
- How Fast Fashion Causes Environmental Poverty. 2020. BORGEM. [accessed 2021 May 7]. <https://www.borgenmagazine.com/fast-fashion-causes-environmental-poverty/>.
- Khan S, Malik A. 2014. Environmental and Health Effects of Textile Industry Wastewater. In: Malik A, Grohmann E, Akhtar R, editors. *Environmental Deterioration and Human Health: Natural and anthropogenic determinants*. Dordrecht: Springer Netherlands. p. 55–71. [accessed 2021 Apr 20]. [https://doi.org/10.1007/978-94-007-7890-0\\_4](https://doi.org/10.1007/978-94-007-7890-0_4).
- Leader D, RN RDL, PHN, Nurse I a R, Leader medical writer who focuses on CL about our editorial process D, RN. What Is an FEV1/FVC Ratio and What Does It Mean? Verywell Health. [accessed 2021 May 7]. <https://www.verywellhealth.com/fev1fvc-ratio-of-fev1-to-fvc-spirometry-914783>.
- Lu AS. 2020. Minimum Wage Level for Garment Workers in the World (Updated in December 2020). FASH455 Global Apparel & Textile Trade and Sourcing. [accessed 2021 Apr 20]. <https://shenglufashion.com/2020/12/04/minimum-wage-level-for-garment-workers-in-the-world-updated-in-december-2020/>.
- Merriam-Webster. Fast Fashion. [accessed 2021 Jun 2]. <https://www.merriam-webster.com/dictionary/fast%20fashion>
- National Occupational Employment and Wage Estimates. May 2017. U.S. Bureau of Labor Statistics. 2018 Mar 30 [accessed 2021 Jun 2]. [https://www.bls.gov/oes/2017/may/oes\\_nat.htm](https://www.bls.gov/oes/2017/may/oes_nat.htm)
- Portier C, Thigpen Tart K, Carter S, Dilworth C, Grambsch A, Gohlke J, Hess J, Howard S, Lubber G, Lutz J, et al. 2010 Apr 21. A Human Health Perspective on Climate Change: A Report Outlining Research Needs on the Human Health Effects of Climate Change. *Environ Health Perspect*. doi:[10.1289/ehp.1002272](https://doi.org/10.1289/ehp.1002272). [accessed 2021 Apr 21]. [http://ehponline.org/static/pdf/hhcc\\_report.pdf](http://ehponline.org/static/pdf/hhcc_report.pdf).
- Saginala K, Barsouk Adam, Aluru JS, Rawla P, Padala SA, Barsouk Alexander. 2020. Epidemiology of Bladder Cancer. *Med Sci (Basel)*. 8(1). doi:[10.3390/medsci8010015](https://doi.org/10.3390/medsci8010015). [accessed 2021 Apr 21]. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7151633/>.
- Serra C;Kogevinas M;Silverman DT;Turuguet D;Tardon A;Garcia-Closas R;Carrato A;Castaño-Vinyals G;Fernandez F;Stewart P;Benavides FG;Gonzalez S;Serra A;Rothman N;Malats N;Dosemeci M; Work in the textile industry in Spain and bladder cancer. *Occupational and environmental medicine*. [accessed 2021 Jun 2]. <https://pubmed.ncbi.nlm.nih.gov/18045847/>

Textile Wet Processing - an overview | ScienceDirect Topics. [accessed 2021 Apr 20].  
<https://www-sciencedirect-com.offcampus.lib.washington.edu/topics/engineering/textile-wet-processing>.

Textile Infomedia. Textile Weaving Process: A Process of Interweaving of Yarn. Textile & Fashion Blogs. 2020 Feb 20 [accessed 2021 Jun 4].  
<https://www.textileinfomedia.com/blog/textile-weaving-process-a-process-of-interweaving-of-yarn/>

The Rana Plaza Accident and its aftermath. 2017 Dec 21. [accessed 2021 May 7].  
[http://www.ilo.org/global/topics/geip/WCMS\\_614394/lang-en/index.htm](http://www.ilo.org/global/topics/geip/WCMS_614394/lang-en/index.htm).

Threading Your Way Through the Labeling Requirements Under the Textile and Wool Acts. 2014 Jul 2. Federal Trade Commission. [accessed 2021 Apr 10].  
<https://www.ftc.gov/tips-advice/business-center/guidance/threading-your-way-through-labeling-requirements-under-textile>.

Thomas D. The High Price of Fast Fashion. The Wall Street Journal. 2019 Aug 29 [accessed 2021 Apr 25]. <https://www.wsj.com/articles/the-high-price-of-fast-fashion-11567096637>

US EPA O. 2015 Aug 20. Aquatic Life Criteria - Ammonia. US EPA. [accessed 2021 May 7]. <https://www.epa.gov/wqc/aquatic-life-criteria-ammonia>.

Webber K. How Fast Fashion Is Killing Rivers Worldwide. EcoWatch. 2019 Jan 31 [accessed 2021 Jan 13]. <https://www.ecowatch.com/fast-fashion-riverblue-2318389169.html>

Weinstein Y. How Long is Short Term Memory? Shorter Than You Might Think. Duke University Academic Resource Center. 2017 Apr 13 [accessed 2021 Apr 10].  
<https://arc.duke.edu/how-long-short-term-memory-shorter-you-might-think#:~:text=Just%2015%2D30%20seconds>.

What Is Fast Fashion? 2020 May 9. Good On You. [accessed 2021 May 6].  
<https://goodonyou.eco/what-is-fast-fashion/>.

Will the fashion industry survive being hit by Trumps tariffs? 2018. PixelPool. [accessed 2021 Apr 23]. <https://pixelpool.com/fashion-industry/>.