<table>
<thead>
<tr>
<th>CONTENTS</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>HEAT AND GLOBAL WILDFIRE EPIDEMIC</td>
<td>4</td>
</tr>
<tr>
<td>GUN VIOLENCE IN RURAL COMMUNITIES</td>
<td>6</td>
</tr>
<tr>
<td>THE DARK SIDE OF TOO MUCH LIGHT</td>
<td>8</td>
</tr>
<tr>
<td>THE DANGERS OF ARSENIC EXPOSURE</td>
<td>10</td>
</tr>
<tr>
<td>ADDRESSING MATERNAL HEALTH</td>
<td>12</td>
</tr>
<tr>
<td>THE EFFECTS OF HURRICANES</td>
<td>14</td>
</tr>
<tr>
<td>ROLE OF WOMEN IN ETHIOPIA</td>
<td>15</td>
</tr>
<tr>
<td>THE TRUTH BEHIND HOTDOGS</td>
<td>16</td>
</tr>
<tr>
<td>RISING RATES OF MALARIA</td>
<td>18</td>
</tr>
<tr>
<td>FUKUSHIMA'S WASTEWATER DISPOSAL</td>
<td>20</td>
</tr>
<tr>
<td>THE FUTURE OF ORGAN TRANSPLANTATION</td>
<td>22</td>
</tr>
<tr>
<td>DEBUNKING FOOD DESERTS</td>
<td>23</td>
</tr>
<tr>
<td>MENTAL HEALTH AND NATURE</td>
<td>24</td>
</tr>
<tr>
<td>BACKPACKS ON STUDENTS' HEALTH</td>
<td>26</td>
</tr>
<tr>
<td>DORM CARBON MONOXIDE DISASTER</td>
<td>28</td>
</tr>
<tr>
<td>HOT VS COLD SHOWERS</td>
<td>30</td>
</tr>
<tr>
<td>BENEFITS OF SLOW EATING</td>
<td>32</td>
</tr>
<tr>
<td>EFFECTS OF NUCLEAR ENERGY</td>
<td>34</td>
</tr>
</tbody>
</table>
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2023 has been a record-breaking year, with Gregor Manukyan breaking the world record for the most chin-ups from a helicopter in one minute, and Yiheng Wang breaking the record for the quickest time solving a Rubik’s cube at 4.69 seconds. However, another record was broken this year, one that has huge implications for the future of public health and the climate. June, July, August, and September have set global records as the hottest of their month in recorded history. This has caused a surge in natural disasters, the likes of which have never been seen before. Southern California received its first-ever tropical storm watch, receiving more rain in two days than they had the entire rest of the year. Most notably, North America has seen a marked increase in wildfires in recent years.

Just in the US, as I am writing this article right now on Friday, October 6th, 2023, 27 large wildfires are burning across 9 states. These fires have burned through more than three hundred thousand acres of land. So far this year, over 2.5 million acres of land have been burnt to ashes in the US.1 Furthermore, Canada set a national record this year for the amount of smoke emissions in a single year. The repercussions of Canadian wildfires are degrading air quality thousands of miles away in Florida.2 In some parts of central Florida, visibility has been decreased to 3-5 miles, due to the wildfire across the continent.2 Furthermore, the Maui wildfires that started in August are described by the EPA as “the deadliest U.S. wildfires in at least 100 years.” The wildfire had a death count approaching 100.3 Due to high winds, at the peak of the fire, the fire was spreading at a rate of one mile per minute.2 Additionally, drought conditions in certain parts of Maui probably contributed to the fire’s fast spread. In addition to Canada and Hawaii, wildfires also affect ed Europe, spreading in Greece, Spain, and Portugal.

This is not only a problem because of the heat of the wildfires and property damage, it is also a public health issue due to the
wildfire smoke. Breathing in particulate matter from wildfires has both short and long-term effects on human health. In the short term, milder effects include burning eyes, sore throats, wheezing, headaches, and coughing, but symptoms can escalate with worse AQI (Air Quality Index), extending to things like heart failure or other cardiovascular and respiratory conditions.

Children, the elderly, and those with respiratory diseases such as asthma are at particular risk of developing harmful manifestations of particulate matter inhalation. During many wildfires, people in the affected areas and far beyond must keep masks on or stay indoors.

Members of the Choate community have felt the repercussions of wildfires directly, especially those living in wildfire-torn states like California, and more recently, New York and Hawaii. Many students have had school days, extracurricular activities, and sports practices canceled due to bad air quality from wildfires. Daneel Polakoff ’25, who lives in Southern California says, “Major highways were closed, and I was not able to swim, or go to school, because...the air quality was so bad.” He also described the potency of the wildfire smoke, saying “if you had any windows open you could just instantly smell it...it was very smokey, very orange outside.”

While the wildfires forecast a depressing view on the future of humanity, it also highlights how these disasters are bringing out the best in people. When the Maui wildfires happened, hundreds of people volunteered to house people who had lost their homes. The climate battle is one that humanity is fighting together, and that is never more visible than during a natural disaster.

Sources

The Uvalde School shooting took the lives of 19 children and two adults when a lone gunman violently stormed into Robb Elementary School on May 24, 2022, in Uvalde, Texas. This shooting has continued to disturb and horrify citizens nationwide at the threat of unprecedented violence in the United States. However, contrary to popular belief, firearm deaths are reportedly more common in rural underprivileged areas of the United States than in urban areas.

It is often believed, due to media publicization and commonly assumed dangers of living in a city, that gun violence occurs more often in urban neighborhoods within the United States. However, this is a disproportionate ideology. According to recent research from the Columbia University Mailman School of Public Health, “The most rural counties had a 25 percent higher overall firearm death rate than the most urban counties...”¹ Though several factors contribute to increasing gun violence in rural and underprivileged areas of the United States, the most significant are accessibility to firearms, the impact of social and economic inequities, and the lack of mental and physical healthcare in these communities.

The Pew Research Center states that, “About seven-in-ten Americans who grew up in a rural area (72%) say there were guns in their household growing up...” ² Gun producers are federally required to perform background checks, however, state legislation can alter this clause. In rural communities and many states, salespeople are not required to perform extensive background checks on consumers. Many underprivileged communities have unsupervised access to guns and firearms, greatly increasing the risk of violence among these communities. Unsupervised access to gun usage allows crime to occur with less consequences and endangers the safety of others. Many argue for creating stricter universal background checks, but a lack of bipartisanship within congressional powers has failed to do so.³

Gun violence is more recurrent in underprivileged rural areas because of various socioeconomic inequities these communities face. Underprivileged neighborhoods and communities that face gun violence are most commonly composed of people of color structured around many social inequities. Racist and prejudiced policies, such as redlining, limit community safety and prosperity. Redlining denies members of these communities financial, educational, and medical aid to thrive. Poverty concentration also contributes to gun violence. The poverty rate is often increasing in underserved communities because of limitations to education and a lack of state and federal funding.³ Without the equity many other communities have achieved with privilege, underprivileged neighborhoods are more vulnerable to gun violence as these factors create unsafe communities. Gun violence further extends the consequences and continuous pattern of economic inequities within underprivileged communities. Because these factors endanger citizens worldwide, many are trying to take measures to eliminate gun violence.

While underserved communities are vulnerable to social and economic equities, they also face unequal distribution of healthcare
services. Healthcare inequalities create a negative impact on mental wellness, a contributing factor to the increasing statistic of gun violence in underprivileged communities. The government has worked to enact laws such as the Extreme Risk Protective Order which allows citizens to file a risk order to remove weapons from mentally unstable citizens. However, processing an Extreme Risk Protective Order takes time, allowing crime and firearm usage to escalate quickly.¹ Discrimination, as well as gaps in education and income, contribute to healthcare inequalities that citizens face daily. Healthcare services in rural areas are also disproportionate to those in urban areas. Because of the sparse population, the ratio of patients to medical providers is largely dominated by those needing assistance. Without equitable access to healthcare, citizens are left to struggle with physical and mental health disorders and are more susceptible to danger.

The multifaceted role firearms play in suicide and homicide in underserved communities only continues to impact citizens nationwide. Without socioeconomic and health equities being met, citizens are struggling to thrive, leading to disparities among communities. Many public health initiatives have set a precedent to decrease gun violence in underserved communities. Initiatives such as universal background checks and improving and expanding both the Affordable Care Act and Medicare work to lessen firearm usage, yet these initiatives have not been fully initiated in society. As a result, gun usage is still very prevalent within underserved communities.⁶

Sources


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Graphics by Sky Hinton '26
THE DARK SIDE OF TOO MUCH LIGHT

By Lily Thomas ’25

We live in a world that is becoming increasingly dependent on light. This light dependency has led to health issues that now affect more than 80% of the planet and 99% of the American population.¹ Unsurprisingly, the very same light pollution impacting the lives of populations around the world is also present within the Choate community, impacting student health and their daily activities.

At an institution like Choate, sleep is extremely valuable, and light pollution is one out of the many reasons preventing students from getting a good night’s sleep. The human body naturally produces a hormone called melatonin, which is only released in the absence of light. Blue lights, in particular, have been proven to reduce melatonin levels, yet they are continually used for many reasons, such as for LED strips or electronic devices. Light pollution occurs, then, because both LEDs and electronics are extremely common in the everyday life of teens, where the side effects of light pollution have a heightened severity for adolescents and teens that are still developing. Consequently, when students are up late using electronics for homework and with LED lights on, the release of melatonin is withheld until it is dark, resulting in sleep deprivation, fatigue, headaches, stress, and even anxiety.

Although the effects of light pollution might not be a priority compared to the extra studying that can be accomplished, it can have long-term impacts on human health. In fact, according to the National Library of Medicine, reduction in melatonin levels in the body and over-exposure to artificial light is linked to cancer.² To combat this, students should start work during the daytime to avoid inhibition of melatonin production. Schools can also mitigate the negative impacts of light pollution by introducing more breaks during the day so that students will have the time to complete their work without risking their physical and mental health. Ideally, students should try studying while there is still daylight, or work in open areas that receive sufficient natural light. This will, in turn, help reduce artificial light use and its consequent health effects. So, the next time you find yourself staying up late to finish homework, you might consider studying earlier in the day for future assignments to avoid the harmful effects of reduced melatonin levels.

Sources

Arsenic exposure poses a significant health risk, primarily through groundwater contamination. This affects not only drinking water but also the crops grown in arsenic-contaminated soil. Prolonged arsenic exposure, even at low or moderate levels, also increases the risk of cancer and various chronic diseases. The U.S. Department of Health and Human Services Agency for Toxic Substances and Disease Registry recognizes arsenic as both a human carcinogen and a toxic substance linked to numerous adverse health effects, ranking it at the top of their substance priority list. It is also important to note that there is no safe threshold for lead exposure in children, as even low levels can lead to cognitive impairment, attention-related behavioral issues, and reduced academic performance.

To mitigate these dangers, the U.S. Environmental Protection Agency (EPA) exercises regulatory control over arsenic levels in public drinking water systems and establishes the maximum allowable contaminant level (MCL). The Final Arsenic Rule, enforced since 2006, aims to lower the arsenic MCL to 10 μg/L in public water systems, taking into account technological feasibility, financial costs, and public health concerns.

Unfortunately, recent research from the Columbia University Mailman School of Public Health highlights striking disparities in the distribution of lead service lines across New York City. The study showed that communities with higher proportions of Hispanic or Latino residents are more likely to have service lines that may contain lead. Additionally, research shows that these potential lead service lines disproportionately affect communities where children are already at a heightened risk of lead exposure from various sources such as lead-based paint, dust, and water.

Dr. Anne Nigra, an assistant professor of Environmental Health Sciences at Columbia Public Health, emphasized the study's goal of informing equitable interventions, particularly the replacement of lead or lead alloy service lines. These findings provide valuable data for policymakers in New York City and New York State to consider these disparities in lead service line locations when prioritizing replacement efforts. Urgent action is needed to identify and replace lead service lines, particularly in areas where vulnerable communities are at increased risk of lead exposure, in order to effectively protect public health.

Arsenic and lead exposure causes significant public health concerns with potential long-term health consequences. Regulatory efforts like the Final Arsenic Rule aim to mitigate arsenic exposure, while studies like the one conducted by Columbia University shed light on disparities in lead service line locations, emphasizing the need for equitable interventions and swift action to ensure the health of vulnerable communities.
Maternal health equity is not only a fundamental human right, but also a critical indicator of societal well-being. Despite advancements in healthcare, persistent maternal health disparities present significant challenges in ensuring that every mother can access quality care and have a safe pregnancy.

In the pursuit of fighting for maternal health equity, epidemiologist Kelli Steidham Hall has brought significant impacts. With a background in nursing and a deep commitment to health equity, she offers a unique perspective as an associate professor in the Heilbrunn Department of Population & Family Health at Columbia University. She sheds light on the often-overlooked drivers of health disparities and expresses, “things like housing instability, food insecurity, structural racism, poverty—they aren’t fully centered in political debates about reproductive access, but they’re centered in people’s lives when they talk about their reproductive choices and outcomes.” Hall underscores the need for individuals to advocate for maternal health equity, emphasizing that achieving justice requires a collective effort.

Maternal health inequity persists across the globe; however, it is particularly pronounced in low-income and minority communities. These vulnerable communities often face challenges such as limited access to prenatal services, racial bias within general healthcare, and unfavorable social determinants of health. All of these barriers contribute to higher rates of preterm birth and other adverse outcomes for both the mothers and their babies. Addressing these disparities is not only a public health urgency, but also a moral imperative that demands policy changes that prioritize equitable access to all women regardless of their racial or socio-economic backgrounds. Drs. Diana W. Bianchi, Janine A. Clayton, and Shannon N. Zenk draw attention to these inequities within maternal health in their online article “Addressing Inequities to IMPROVE Maternal Health for All.” According to this article, “Non-Hispanic Black people are about three times as likely as White people to die from a pregnancy-related cause, regardless of income or education level.” Achieving equitable maternal health outcomes requires targeted interventions that not only bridge racial disparities, but also challenge the structural factors perpetuating these disparities.

But how can communities ensure that every mother, regardless of her background or circumstances, has an equal opportunity to access quality maternal healthcare and achieve the best possible health outcomes for herself and her babies?

Maternal health equity hinges on a multifaceted approach encompassing policy reform, community engagement, and healthcare system changes.
Advancing Maternal Health Equity: A Collective Imperative

By Jolie Zhang ’26

improvements. Policy changes, such as expanding Medicaid coverage and mandating paid family leave, are essential to providing equitable access to healthcare. Engaging communities in conversations about maternal health equity empowers them to share insights, ensuring culturally sensitive solutions. Moreover, it also raises awareness for these mothers. Healthcare system improvements must address implicit biases, refine care quality for marginalized communities, and expand services in underserved areas. Robust data collection is pivotal for identifying inequities and monitoring progress. Addressing social determinants like housing stability, food security, education, and employment is equally vital. Initiatives in these areas extend the reach of maternal health equity efforts beyond healthcare services. By advocating for policy shifts, fostering community engagement, improving healthcare systems, utilizing data-driven approaches, and addressing social determinants, every mother becomes one step closer to having equal access to quality maternal healthcare.

In conclusion, maternal health equity stands as a pivotal public health imperative, reverberating across the well-being of families, communities, and society at large. The impact of maternal health on future generations underscores the urgency of our collective action. It’s more than just a matter of health; it’s a matter of justice, equality, and the very trajectory of our society. To forge a path toward equity, society must confront the root causes of inequity, amplifying the voices of marginalized communities, and dismantling systemic barriers that hinder access to quality care. By nurturing a society where every mother, regardless of their background or circumstances, can embark on a journey to motherhood with hope and assurance, we pave the way for healthier families and a more just future.

Sources


THE EFFECTS OF HURRICANES

By Caroline Kim '25

On August 8, 2023, deadly wildfires swept through the island of Maui, devastating the town of Lahaina. They destroyed over 2,200 buildings and left 4,000 citizens without shelter. These fires were ultimately the result of Hurricane Dora, the longest-lasting Category 4 hurricane ever recorded in the Pacific. This tragic event is just one example of the increasingly destructive nature of hurricanes. Climate change has caused a sharp uptick in hurricane frequency and intensity. This disproportionately affects vulnerable populations, warranting some sort of intervention to prevent any disastrous consequences.

New studies show that hurricane damage will continue to rise over the following decades. This trend is caused by a combination of different factors. As ocean temperatures rise, storms are provided with more moisture, fueling extreme rainfall and slowing hurricane speed. Rising ocean levels also increase the height of storm surges, which are walls of water whipped up by hurricanes that eventually hit shorelines. These factors will only grow more pronounced over the coming years. To make matters worse, the populations that most experience hurricane damage often lack the resources necessary to recover.

Vulnerable populations are put at a disadvantage before a hurricane even arrives. Poor communities are often high-risk flood zones because their land is less expensive. Cheaper homes also lack proper infrastructure, and poor neighborhoods do not receive timely warnings about hurricanes. Once a hurricane hits, the death toll for vulnerable populations far exceeds that of affluent neighborhoods. Immediately after a hurricane, most emergency resources are directed away from particular demographics including multiple-family households and certain ethnic groups. Recent studies show that excess deaths following hurricanes are typically centered around areas with high minority populations. Vulnerable groups are placed at such a severe disadvantage that they cannot make full recoveries. This pattern must be addressed urgently given the predicted rise in hurricane frequency and intensity.

Some solutions can be implemented easily, while others require long-term measures. For example, if cities were to mandate an equal response to all affected populations following a hurricane, the disproportionate financial burden placed on low-income families to repair damages would be diminished. Long-term solutions include rebuilding houses with poor infrastructure, and in some cases, rethinking entire city layouts to accommodate for rising sea levels. Regardless of the type of change required, it is clear that such measures are necessary for the safety of families and communities.

Sources
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Graphic by Carolyn Chen '25
Ethiopia, one of the world’s most rural countries, grapples with severe issues such as lacking safe drinking water, nutrition, and sanitation which collectively affect its population’s overall health. The country’s rural circumstances make it hard for the government’s healthcare system to reach everyone in need of help, compounded with an extreme shortage of healthcare professionals needed to support Ethiopia’s large population of over 110 million people.

In response to these formidable challenges and their large-scale impacts, the government, according to Ethiopian Health Minister Tedros Adhanom Ghebreyesus, constructed a “women-centered” health system “by linking leaders at the national, regional and district levels with women’s groups in every village across the country.” These women are trained to provide essential primary health services to rural villages, to alert communities of health emergencies, and to educate families on taking responsibility for their health, tackling the major rural access problem present in Ethiopia. Additionally, a “Women’s Development Army,” made up of female volunteers from across the country, focuses on sparking local change within communities. Acting as “model examples” for the primary healthcare workers, they make regular rounds to check on neighbors and encourage healthy practices.

Nonetheless, despite the tireless effort of organizations like the U.S. Agency for International Development (USAID) to support and enhance healthcare across West Africa and Ethiopia, female healthcare workers continue to face a daunting burden. The often isolated and marginalized women healthcare workers work over 98 hours a week to deliver some families’ only healthcare, and yet, they are rarely ever supported. They receive minimal to no pay, only about 2158 EBT (38 USD) per month, making them unable to support themselves with enough food and shelter. At the same time, when work conditions and pay rates improve, men often move into these jobs, leaving the women who have put in countless hours of work without a job.

As more and more women have started to fight for equal pay all over the world, the importance of paying community health workers and women’s equity have become crucial conversation topics between organizations like the United Nations, the Global Fund, and the World Health Association. Women have played a pivotal role in the reduction of malaria, AIDS deaths, and maternal mortalities in Ethiopia, and their selfless dedication to their communities deserves recognition and support.

Sources

Graphic by Sky Hinton ’26
Whether at a baseball game or a backyard barbecue decked out in red, white, and blue, the hot dog is a classic food that families all over the United States enjoy. But while this dish is popular among many, most people are unaware of the health risks it poses.

Researchers at the University of Michigan have sprung a controversy surrounding hot dogs. In this study, 5,853 foods denoted to be a part of the U.S. diet were analyzed based on a confusing yet controversial metric: minutes of healthy life gained or lost. Though the index was created as an accessible method of gauging the health burden of particular foods based on nutritional value and chemical composition, mass media have exaggerated these findings by assuming hyper-literal rhetoric.

Still, the hot dog, a staple dish in American culture, is not without its health concerns. Consisting of a grilled sausage placed on a partially sliced bun and decorated with some combination of mustard, ketchup, relish, and onions, the hot dog is both prevalent and varied in its presentation. Most hot dogs in American commercial circulation are skinless, meaning that the meat is wrapped in a long tube of thin cellulose as opposed to the natural small intestine casings.

Concerns arise when observing the nutritional content of the hot dog; hot dogs are high in fat, salts, and preservatives. Various research studies, such as those conducted by the World Health Organization and the American Institute for Cancer Research, hint at the carcinogenic effects of hot dogs. Furthermore, hot dogs are a haven of pathogens that originate from improper cooking. For instance, the bacteria Listeria monocytogenes is capable of inducing serious infections in pregnant women and infants.

Despite the myriad of potential health risks, the skinless casing reveals a larger, broader issue: processed meats. These flavor-enhanced and shelf-life-prolonged products are prepared through variations of curing, fermenting, smoking, and salting, and they have colonized the composition of food in the past few decades. Processed meats (e.g., ham, sausage, bacon, deli meats, jerky, pepperoni, and hot dogs) contribute to countless dangers including, but not limited to, inflammation in the body due to the chemical alteration of gut microbiomes, increased risk of dementia and Alzheimer’s disease, and vulnerability to cardiovascular disease due to abnormally high blood pressure levels.

By unpacking the components that make up a hot dog, it is clear that this staple American dish is not without its flaws. It’s important to extend these cautions to other processed foods that may pose similar health risks. By making these conscious food choices, we can all strive for healthier lifestyles.

Sources

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TH BEHIND HOT DOGS

Graphic by Evelyn Kim '25
By Deyi Meng '26

Malaria, the world’s most deadly mosquito-borne parasitic disease, continues to haunt our global health landscape. According to the World Health Organization, 2021 witnessed a staggering 247 million case of malaria, with an estimated death toll of around 619,000. Addressing malaria is not only a medical imperative but also a part of the Millenium Development Goals that all United Nations Member States committed to achieving.

Climate change, a term encompassing “statistically significant variation in either the mean state of the climate or in its variability, persisting for an extended period -- typically decades or longer -- that may be attributed to natural internal processes, external forcing, or persistent anthropogenic changes in the composition of the atmosphere or in land use” (Fernando, n.d.). The global temperature has been on a climb for the past century, with a dramatic acceleration in the 1950’s. In fact, the years 2016 and 2020 were recorded as the warmest years since 1880.

The impact of climate change on malaria is multifaceted, affecting crucial factors in its transmission. These include the lifespan of mosquitoes and the development of malaria parasites with them. Climate change opens up opportunities for malaria transmission in traditionally malarious areas, controlled zones, and previously unaffected areas. The increase in temperature, rainfall, and humidity promotes proliferation of mosquitoes populations in high-altitude areas, introducing malaria to regions previously untouched. In lower-altitude areas where malaria was already a threat, climate change alters the growth cycle of mosquitoes, increasing transmission rates.

Additionally, climate change significantly influences the El Niño cycle, which will increase the transmission of malaria. Increased rainfall will cause previously dry areas to become wet, serving as an ideal breeding ground for mosquitoes. Rising humidity creates droughts and transforms rivers into strings of pools, the ideal breeding condition for mosquitoes. Many regions depended on heavy rainfall to wash out mosquito breeding sites, and a lack of rain will lessen this natural defense. In fact, one-third of the increase in malaria cases can be attributed to the dryness of the El Niño cycle.

The World Health Organization predicts that there will be an additional 60,000 cases per year of malaria between 2030 and 2050 due to climate change. By 2050, climate change will expose areas in South America, Sub-Saharan Africa, and China to a 50% increase in malaria transmission.

Although the effect of climate change on malaria has not yet been quantified, it is clear that climate change poses an immediate threat to the spread of the disease. As such, malaria must be closely monitored and observed, and research and funding needs to be continued to provide treatment for those currently affected and to monitor how the disease evolves over time.

Sources
RISING TEMPERATURES, RISING RATES OF MALARIA
On March 11, 2011, a tsunami struck a powerplant in Fukushima, as a result, the worst nuclear disaster since Chernobyl occurred.2 The treated radioactive wastewater from the Fukushima Nuclear disaster has been kept in a tank for the past 12 years, but on August 24, 2023, it was released into the ocean off the coast of Japan.1 Discharging treated wastewater into the ocean is a common procedure for nuclear facilities, however, Fukushima's release is being criticized for its exceptionally large volume, surpassing previous norms. Thus, there are definitely some dangerous effects and health implications for Fukushima's wastewater release.

The releasing process of the wastewater involves the Fukushima water going through the Advanced Liquid Processing System (ALPS), which reduces most radioactive substances to acceptable standards, apart from tritium and carbon-14 — radioactive variants of hydrogen and carbon. While their radiation emissions are extremely low, there are potential risks associated with significant consumption of these substances, especially with the exceptionally large volume of radioactive wastewater coming from Fukushima's release. Tritium and carbon-14, when consumed at large volumes can increase the risk of cancer.5

Despite the government assurances that the release of Fukushima's wastewater is safe, UN-appointed human rights experts and environmental activists have opposed the release.6 Greenpeace, for example, has recently issued reports that raise significant doubts about the effectiveness of Tepco's treatment process for radioactive wastewater, contending that it falls short of adequately eliminating radioactive substances from the treated water. Critics of the plan to release the treated water into the ocean propose a different course of action for Japan. They argue that, at least for the time being, the country should opt to store the treated water in tanks rather than discharging it into the environment.

The release of treated radioactive wastewater from the Fukushima disaster into the ocean marks a critical and controversial moment in the ongoing efforts to manage the aftermath of the 2011 catastrophe. Fukushima's release stands out due to its unprecedented scale and the presence of tritium and carbon-14, which pose potential health risks for Japan's waters and its neighboring countries. Therefore, it is essential to continue addressing concerns about the release of radioactive wastewater transparently to ensure that it is managed with caution and consideration for the well-being of both the environment and the public.

**Sources**


Where there are more organs needed than those that are available, Xenotransplantation serves as an alternate means to use non-human cells, tissues, or organs to treat medical conditions.¹ Specifically, recent breakthroughs have been made where genetically modified pig organs have the potential to save lives.

Pig hearts and kidneys have similar functions to humans. At NYU Langone Health, the latest experiment notes that even in patients on ventilators who no longer have proper neurological functions, kidney transplants from pigs remain stable in the human body and continue to maintain stable bodily functions such as urinary filtration.²

In the University of Maryland, surgeons have recently transplanted a pig's heart into a man with terminal heart disease. Dr. Muhammad Mohiuddin was involved in this process, and he wants this research to become open to the public, so more people will understand the concept of xenotransplantation. Dr. Mohiuddin's hope is that people will not be shocked at the ideas and experiments of xenotransplantation, where a deceased body is able to mimic that of a live patient's reactions to a pig organ.²

More than 100,000 patients are on the nation's transplant list and thousands die each year waiting. Researchers use pigs, as primate organs carry the risk of infectious diseases. Furthermore there are ethical concerns on using human organs which can influence the decisions of those who need treatment. On the other hand, pig organs are similar sizes and are an effective human-organ alternative. Pork is also a common food source in our everyday lives, so there is less of an ethical concern. Even before pig organ transplantation, tissues and hormones from pigs have been used for years in the medical sector for heart valves, insulin, and hormones.¹

Genetically altering the makeup of a pig has become much easier and quicker using clustered regularly interspaced short palindromic repeats (CRISPR). CRISPR has been increasingly incorporated into research by scientists, and was recently used in the genetic modification of pig organs, allowing for selective changes to be made in the DNA of these living organisms.³

Safety, however, can be a big issue for CRISPR as there can be off-target mutations which can lead to unintended modifications. Specifically, mistakes can occur involving tumor suppressor genes, or oncogenes, leading to the development of cancer.

Despite safety concerns of CRISPR, it has allowed for the removal of the porcine endogenous retrovirus (PERV) gene that has made altering the genome of pigs quite challenging for many decades. This has allowed for the generation of viable organ donor pigs, simultaneously reducing the risks of transmitting infectious diseases—a step forward in making xenotransplantation a practical medical procedure.³

Xenotransplantation serves as a promising avenue for battling our organ shortage crisis. By revolutionizing organ transplantation, xenotransplantation has the potential to open the door for donor animals, reducing the wait time to acquire organs while offering the opportunity to save countless lives.

Sources


By Evelyn Kelly ’25

Food deserts are geographical regions where residents have little to no access to convenient, affordable, healthy food. Found mostly in places with higher poverty rates, this causes those struggling financially to have trouble finding good food for themselves and their families. 6.2% of the U.S. population have little access to grocery stores,1 as the USDA’s food access research report says. Many families have to sacrifice other essentials to get food.2

Some factors that cause food insecurity include poverty, unemployment, lack of affordable housing, racial discrimination, low income, lack of access to healthcare, and health conditions. This creates complications with how a child develops—physically and emotionally. Food insecurity also leads to those with health issues having to decide between their medicine and food.3

Many rural areas have food deserts, especially if in an area with lower incomes, higher rates of abandoned or unused houses, smaller populations, lower education levels, and more.4 Living in a rural food desert is especially difficult due to there being fewer available forms of transportation and fewer people for a grocery store to want to invest in that area. This also leads to a lack of food pantries and other organizations that help with that. Research from The Journal of Family Social Work states, “What this means is that those living in a rural area are at a disadvantage as they are not only typically further from food pantries, but they have less available produce and nutritious food to choose from.”3 But, many organizations are attempting to help. SNAP, WIC, CSA, EFNEP, and many others aid children in getting proper food.

While urban areas have more options for food, in high-poverty areas, there are many stretches of metropolitan areas where there is a lack of grocery stores, especially affordable and healthy grocery stores. There may be gas stations or bodegas, but a lot of times those do not have as many healthy options. These are often more expensive if trying to buy in bulk, making it hard to provide for an entire family.5

When the supermarkets are farther away, it also brings in the issue of transportation. In an article by the National Library of Medicine, Jason Gilliland suggests, “Cities should support planning policies that boost the inner-city population (e.g., better transportation, housing, and schools) while offering grocery retailers direct incentives (e.g., zoning allowances, tax holidays, or tax rebates) to locate downtown,”5 He also suggests farmers markets, “mobile markets”, and ride-sharing.

In conclusion, food deserts are one of the United State’s biggest issues, both in the city and rural areas. While there are many initiatives to help lighten the load, more solutions and actions are required to help those living with food insecurity.

Sources

How many hours a day do people spend on their phone? According to a 2016 Nielson report, most Americans spend more than 10 hours on electronic devices. This upward trend of urban living and increased use of electronic devices minimizes the time and access people have in nature. However, mounting evidence indicates that spending time in nature is beneficial for both psychological and physical health.

Time spent in nature is linked to a widened attention span, reduced risk of psychological disorders, and an increase in empathy and cooperation. Psychologist Lisa Nisbet at Trent University, who studies connectedness to nature says, “You can boost your mood just by walking in nature, even in urban nature. And the sense of connection you have with the natural world seems to contribute to happiness even when you’re not physically immersed in nature” (Weir, 2020). University of Chicago Psychologist Marc Berman and his student Kathryn Schertz found in a 2019 review that green spaces near schools promote cognitive development and self-control behaviors in children. In the International Journal of Wellbeing, Nisbet and colleagues explore three hypotheses. The first, the biophilia hypothesis, argues that because our primitive ancestors evolved and relied on nature, we have an innate urge to connect with it. The second hypothesis, the stress reduction hypothesis, states that exposure to nature triggers a physiological response that decreases stress levels. Finally, the third hypothesis, the attention restoration theory, expresses that exposure to nature replenishes one’s ability to concentrate and focus as well as other cognitive resources. All of these studies affirm that nature always has a positive effect on one’s mood and mental health, cognitive function, self control, memory, and more. These hypotheses discuss the longstanding connection between humans and nature and the potential effects of spending time in nature on our stress levels.

There is a compelling amount of evidence supporting the idea that spending time in nature positively affects cognitive function, mental health, and susceptibility to mental illness. This evidence has emerged from numerous experiments and research conducted in a wide range of environments and diverse populations. While spending time in nature can be challenging due to the distractions and obstacles of daily life, any effort to do so, whether in urban or suburban settings, is always worthwhile.

Sources


IMPROVED MENTAL HEALTH: CONNECTING WITH NATURE

By Sophie Chung ’27

Graphic by Melody Qian ’24
As busy Choate students, it often feels as if we’re carrying the weight of the world on our shoulders, quite literally. Whether it be filled with textbooks, running shoes, extra clothing layers, or a combination of those items, our backpacks can easily become extremely heavy. And while this may seem like an everyday occurrence, it can actually cause serious health problems.

Carrying a heavy weight on your shoulders may cause your body to lean forward or arch backwards. This creates an unnatural position where the spine is compressed, and can often lead to shoulder, neck, or back pain. The excessive weight of your backpack can also be transmitted through joints in the spine, hips, and knees, leading to issues such as a loss of range in motion, chronic back pain, herniated discs, and increased risk of premature osteoarthritis. In fact, 80% of adults experience lower back pain at some point in their lives, and carrying heavy items is a leading cause of this problem.

When in a rush, students sometimes choose to carry their backpacks on only one shoulder. Although this may be more efficient, doing so causes your body to lean to one side to offset the extra weight, thus straining your shoulders and neck. Over time, this can cause functional scoliosis, a condition that teenage girls are more susceptible to. Even wearing a backpack that hangs too low can pull on overworked neck muscles and lead to headaches.

Some students have opted to carry their school supplies in shoulder bags instead of backpacks. However, this method risks further injuries and health complications. For example, a heavy purse forces the user to lift one shoulder slightly, curving the spine in a way that may lead to misalignment. If this becomes a persistent issue, the user may experience back, neck, shoulder, and muscle pain.

Keeping the bag on the same shoulder for too long can cause the shoulder to roll forward and down, weakening muscles in the upper back and neck. This can lead to severe issues such as thoracic outlet syndrome.

In general, backpacks are a better option because the weight is more evenly distributed and it is supported by the strongest muscles: the back and abdominal muscles.

If you find yourself struggling to get your backpack on or off, constantly leaning forward, or experiencing back pain, it may be time to reevaluate your backpack choices. When shopping for a backpack, look for one with two padded straps over the shoulder, the wider the better. Always use both shoulder straps and adjust them to fit close to your body. A lightweight bag with multiple compartments is also ideal. Be sure to place heavier items closer to your back and to make use of side pockets to spread out your load. A backpack should weigh less than 10-20% of your body weight, and less is always better. According to the American Academy of Orthopedic Surgeons, a backpack should hang two inches above the waist for an optimal fit. To decrease the weight, opt for digital textbooks if possible and utilize your locker or dorm room.

Although backpacks are a necessity in a student’s life, they are often overlooked. By paying attention to the weight you’re
The Truth Behind Backpacks:
A Weight That Impacts Student Health

By Claire Liu ’24

Carrying around campus, you can prevent significant health issues and ensure your success as a Choate student.

Sources


Graphic by Melody Qian ’24
At the crack of dawn on September 3, fire alarms pierced through the walls of Hall and West Wing. Panic and confusion filled the minds of the half-awake students, as they stumbled to get out of the dorms. Little did they know that the cause of the alarm wasn’t any ordinary fire drill or a case of burnt popcorn, rather a far deadlier hazard: a carbon monoxide leak.

Hall resident, Nao Murata ’25, recalls her feelings from the tumultuous morning. She said, “Initially, we all thought it was a drill, so we all evacuated with ease. That was until we heard fire trucks and saw firemen rushing into the building. From then on it was quite clear that maybe something really was wrong. Of course, no one would have guessed there was a carbon monoxide leak.”

When it became clear that this wasn’t an easy fix situation, the Hall and West Wing residents took shelter in Steele Hall, many taking naps on the floors of their language classrooms. Approximately one hour later, they relocated to St. John Hall, where they remained for another two hours. Finally, after nearly four grueling hours, the residents were given the green light to return back to their dorms.

Zooey Schamis ’26, a West Wing resident, describes her experience as being far from rosy. “The firemen said the carbon monoxide came from a ‘burp’ in the boiler room underneath the dining hall, which was coincidentally right below me. So I had to go into an ambulance and they performed a bunch of medical tests. It was pretty scary, but I knew I was going to be okay because I felt completely fine,” she recounts.

While this may be an amusing story, carbon monoxide leaks should be a cause for grave concern. When an excess of carbon monoxide is present in the environment, it displaces the oxygen in our red blood cells, potentially leading to tissue damage and even death. Symptoms of carbon monoxide poisoning include, but are not limited to, headache, weakness, dizziness, nausea, and loss of muscle control. More serious symptoms include memory loss, personality changes, and movement problems. What makes carbon monoxide even scarier is its complete lack of odor, taste, and color — rendering it a silent yet deadly killer. Often, the combustion of fuels, such as gas, wood, propane, or charcoal, produces small amounts of carbon monoxide. However, without proper maintenance of ventilation systems, the gas can accumulate up to lethal levels.

Anyone exposed to carbon monoxide should seek fresh air and immediate medical attention. In the event of being unresponsive, call emergency medical services or 911 right away.

Sources


Note: No one was in a deadly circumstance, and the School's systems functioned to emphasize student safety.
Dorm Disaster: The 5AM Carbon Monoxide Alarm

Lee '25

Graphic by Evelyn Kim '25
The topic of whether hot or cold showers are more beneficial has been greatly debated. Both have been used for therapeutic and medical purposes, and both can have significant impacts on both physical and mental health. Hot showers are known to have a calming effect on our bodies, while cold showers increase alertness and help us wake up in the morning. Recent social media trends promoting healthier lifestyles have increased the popularity of cold showers. Are they really more beneficial than hot showers, though?

The obvious benefit of cold showers is that they can reduce drowsiness, especially in the mornings. They have also been found to improve mental health. A recent study done by the Virginia Commonwealth University School of Medicine proves that hydrotherapy, or exposing people to cold water, can be a treatment for depression. The water is meant to impact the “sympathetic nervous system and increase the blood level ... and to increase synaptic release of noradrenaline in the brain.”¹ Cold showers also help improve circulation, since cold water causes the blood vessels to flow away from the surface of skin. The main reason why cold showers have become a popular online trend is because they can decrease inflammation and swelling. Cold showers cool the body down after exercise. However, soreness or pain due to exercise is treated with hot water instead.

The benefits of a hot shower are focused more on soothing our bodies rather than increasing alertness. For centuries, hot water has been used to calm the mind and body. It can help decrease muscle soreness, relieve joint pain, and relax the body in general. Due to these positive effects, hot showers are recommended after exercise and sport practices. Also, higher temperatures are proven to enhance blood flow, which improves cardiovascular health, relieves headaches, and eases any kind of pain or tension. Along with the soothing effect, hot showers also help with sleep patterns. A study conducted by the Cockrell School of Engineering found that taking a shower 1-2 hours before bedtime in water at 104-109°F Fahrenheit can significantly improve sleep by affecting the body’s circadian sleep rhythms.²

Both hot and cold showers have benefits that target different aspects of your body. There are also negative effects of each, with hot showers being irritating to dry skin or eczema, and cold showers being hard on weaker immune systems. Healthline recommends a lukewarm shower, or the Dr. Sebastian Kneipp technique, where the water temperature alternates between one minute of cold, then one minute of hot. Any of these methods for shower temperatures can be optimal, depending on the effects that you want.

Sources


Hot vs Cold Showers: Which is Better For Your Health?

By Hannah Quan ’26

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Blog cold-showers-on-tiktok-recommended-by-experts/#:~:text=Many%20people%20in%20the%20trendy
When it comes to the topic of healthy eating habits, most will readily agree that the content on your plate matters. However, it is not commonly known of the effects of eating speed on our health. Based on several studies, eating slower can help people live healthier with better digestion, reduced weight gain, and improved mental satisfaction.

Mealtimes are often stressful affairs. How fast can you guzzle down a meal before you rush to the next engagement? How can we transform our meals from a quick passing duty to an engaging, long-lasting event? Well, have you ever thought of slowing down your eating speed? When we slow down and savor our meals, the mental satisfaction that comes with them helps us feel and stay full for much longer than when a meal is rushed. Eating slower helps you realize the importance of what you are putting in your body, which in turn leads to gratitude and satisfaction for your meal.

Furthermore, when eating for a lengthy period of time, the body sends out timely signals, allowing the brain to acknowledge that the stomach is satisfied. Brian St. Pierre, MS, RD, agrees when he writes, “One of the most important benefits of eating slowly is that it gives your body time to recognize that you’re full.” (Pierre, 2021) The process of digestion is a step-by-step process with many important processes, such as the secretion of saliva, acid production, and much more. If we rush this digestion process, the brain fails to send out signals in time, straining the stomach by overloading food. Therefore, eating slowly is recommended for the healthy digestion of our meals and maintaining a robust digestive system.

In addition, a University of Rhode Island study was conducted on thirty women to explore the difference in caloric intake in correlation with the pace of eating. In the first study, they were asked to eat quickly, and in the second study, they were asked to eat slowly. “When eating quickly, the women consumed 646 calories in 9 minutes. When eating slowly, the women consumed 579 calories in 29 minutes.” (Pierre, 2021) This study warns us that speedier eating is also unhealthier eating. While this difference in calories might seem insignificant in individual portions, it can quickly add up over a large span of time.

How can we practice slow eating? In order to monitor your eating speed, a helpful tip may be to count the number of times you chew. This may help draw attention to your food and the portion you are consuming, eventually leading to a longer meal time.

Eating is one of the things often brushed aside in the rush of today’s society. To combat this lack of focus, we need to make a conscious effort to take our time when eating. These efforts will result in health benefits such as healthy digestion, lower calorie intake, and improved mental satisfaction.

Sources
Sa vor the Fla vor: The Health Benefits of Slower Eating

Lois Kahu ’26


Graphic by Melody Qian '24
A tiny neutron, a miniscule particle, collides with a uranium atom with enough energy to split it. This collision is enough to release more neutrons, which continue to collide with uranium atoms, forming an endless cycle. This collision also releases immense amounts of heat and radiation. When collisions spiral out of control, it can result in disasters that alter the landscape of environments and impact entire populations of people.

Nuclear power is a way of generating energy through fission, or the splitting of uranium atoms.¹ Compared to fossil fuels, generating energy using nuclear power does not produce as much air pollution or carbon dioxide – a seemingly clean energy source. However, when looked at more closely, nuclear energy requires the mining of uranium or plutonium ore, as well as the construction of a nuclear power plant using large amounts of metal and concrete, all of which contribute to emissions.² On top of this, nuclear power also comes with an underlying risk: radioactive waste generation and radiation exposure.

Nuclear reactions are tightly controlled to prevent reactor accidents, which are uncommon, but can occur when there is damage to the core containing fuel and fission products that power energy generation. Damage to the core generally results from a failure of the core cooling system, leading to increasing temperatures and pressure that result in explosions within the reactor.² As a result, even though redundant barriers and containment structures are in place, reactor accidents can lead to high levels of radiation being released into the air and water. On the other hand, generating nuclear power also produces radioactive wastes, which can lead to serious environmental contamination if carelessly discarded. To prevent radioactive pollution, waste, generally in the form of spent nuclear reactor fuel, is stored in specially designed pools of water or dry storage facilities that act as radiation shields.²

Radiation from nuclear energy generation can also have an impact on human health. Human radiation exposure is generally referred to as ionizing radiation, where unstable isotopes spontaneously break down, releasing radiation in the process; the most common isotopes are iodine-131 (I-131), cesium-134 (Cs-134), and Cs-137.³ Exposure is organized into three groups:

- Total or partial body exposure: irradiation of the body either on the surface of the skin or deeply into the organs.
- External contamination: fission products settle on the body;
- Internal contamination: ingestion of fission products or fission products entering the body through open wounds.

The effects of exposure largely depend on the type and quantity of isotopes released, the amount and duration someone is exposed to radiation, how a person contacts radioactive material, and the age of the affected individual. At the molecular level, radiation exposure primarily results in DNA damage. This can develop into mutations that cause radiation sickness, cardiovascular disease, and cataracts.³ Additionally, radiation exposure also increases the risk of cancer development, and recent genomic analyses have revealed that children and adolescents exposed to I-131 from reactor accidents are more likely to develop thyroid cancer.³
Despite the environmental and public health risks of reactor accidents, nuclear energy is still an important source of energy in our modern world. Because of this, researchers and medical professionals are continually working on developing better preventative and protective methods.

Sources


Graphic by Carolyn Chen ’25