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# CHOATE PUBLIC HEALTH

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# CONTENTS



Dear Choate Community,

As the leaves change colors and the air becomes cooler than before, the fall term has finally come to an end. Even though this term's COVID-19 measures have been more relaxed compared to those of last year, remnants of life during the pandemic still exist. For example, masks remain an essential in classrooms. Perhaps, transitioning from a Zoom to an in-person lifestyle presented some of its unique challenges. Gone were the days where students could wake up two minutes before class and still come to virtual classes on time. For those who have cozied up indoors for a while, some undesirable muscle soreness has made an appearance once again, as sports have come back in full swing. Regardless of these readjustments, Choate students now get the chance to go into the town of Wallingford, eat meals with many friends around the dining hall tables, remain unmasked in residential areas, attend school meetings in Colony Hall, and watch art performances in person — just to name a few changes to the COVID-19 protocols.

With these transitions, it is important to be kind to ourselves as we find out what works for us and what does not. This fall term may have been marvelous... or it may have not. Regardless of how the fall term has progressed, it is a term that can be used as a reference for the winter and spring terms ahead. We have now finished one-third of the school year, but there is still time to explore new activities, develop better habits for ourselves, and make new friends. Remember that support can come in many forms — from a call home to parents and time spent with friends to a conversation with deans and advisers and a counseling session with counselors on campus.

This is the second issue of Choate Public Health Magazine for the fall term this year. While the issue does not revolve around a theme in particular, we hope to bring to the community some interesting articles to read. Our goal as a publication is to facilitate public health awareness, so as the winter term approaches, if you have a health/medical topic you wish to learn more about or a topic in which you think it would be helpful for the Choate community to be aware of, please contact us. If you would like to write for the publication, please check out our Google Forms on the Choate Portal and BoarCast.

We wish you all a fantastic fall break, and we hope you all stay safe and healthy!

Sincerely,

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# SHINING SOME LIGHT ON SUNSCREEN

By Evelyn Lee '24

Sauntering down a sunscreen aisle in your local pharmacy might seem intimidating: the hundreds of sunscreen bottles that tower over the overpacked shelves are much too many to choose from. Soon enough, you find yourself lost in a mirage of questions: Which sunscreen should I buy? Which SPF works the best? What does SPF even mean? Do I even need sunscreen at all?

SPF, short for Sunburn Protection Factor, measures the amount of ultraviolet rays required to produce sunburn on sunscreen-protected skin.[1] Essentially, the higher the SPF ratings in sunscreens, the greater protection from ultraviolet (UV) rays. However, there is no sunscreen that ensures to block 100% of the rays. Most dermatologists recommend using a sunscreen with at least an SPF of 30, which can block 97% of the sun's UV rays.[2]

Sunscreens provide protection from two types of damaging UV rays: long waves (UVA) and short waves (UVB). UVA rays can cause skin aging while UVB rays can cause sunburn. Exposure to these rays not only leads to premature skin aging that appear in the form of dark spots, sags, and wrinkles, but also elevates the risk of detrimental health effects like skin cancer.[3] This makes it important for all of us — no matter our age, background, or gender — to apply sunscreen everyday. The best practice is to reapply sunscreen every two hours and more frequently when swimming or sweating.[4]

Sunscreens can be categorized into two types: mineral and chemical sunscreens. Mineral sunscreens act as a physical blocker that deflects UV rays through one of two active ingredients, Zinc oxide or Titanium Dioxide. Conversely, chemical sunscreens absorb UV rays, convert them into heat, then release the converted UV rays from the skin. Their active ingredients include aminobenzoic acid, avobenzone, octisalate, octocrylene, and oxybenzone — all of which consist of carbon-containing molecules.[5]

Graphic by Yuko Tanaka '22

So, the next time you end up in the sunscreen aisle, don't feel confused. Look around and be sure to keep in mind the many different choices to choose from: varying levels of SPF, mineral and chemical sunscreens, etc. Remember to always take a proactive approach to protect your skin and your health with sunscreen!

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# NEW RTS,S VACCINE COMBATS MALARIA

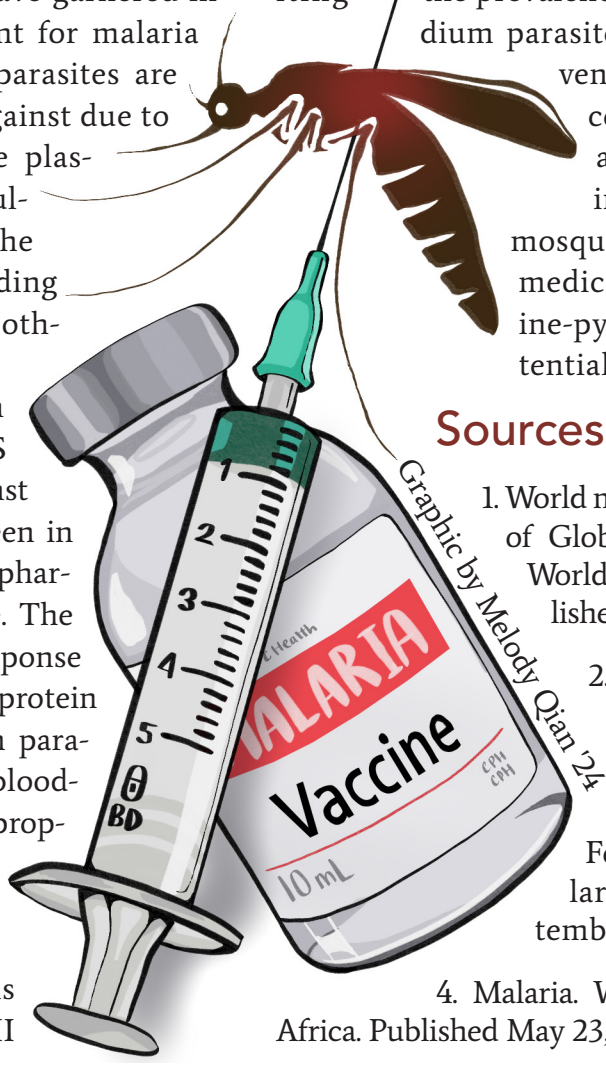
By Luke Callaghan '23
and Alex Skrypek '23

The plasmodium parasite, a shapeshifting disease vector transmitted by mosquitoes, is responsible for almost half a million deaths annually. More recognizable by its name "malaria," the disease infects almost 230 million people every year without signs of regression.[1] While malaria is most prevalent in infants across sub-Saharan Africa, its significant fatalities have garnered international attention.[2] Treatment for malaria is not easily accessible, as the parasites are notoriously difficult to defend against due to their biological complexity. The plasmodium parasite alone has multiple methods of sequestering the human immune system, including changing its shape to transfer to other cells in the bloodstream.

Recently, the World Health Organization endorsed the RTS,S vaccine for partial protection against malaria. Since 1987, RTS,S has been in development by London-based pharmaceutical firm GlaxoSmithKline. The vaccine evokes an immune response against malaria by introducing a protein that is found on the plasmodium parasites when they initially enter the bloodstream. The inoculation provides proper antibodies that bind to the plasmodium parasite, neutralizing it and preventing replication.

Even though the vaccine is proven to be effective in stage III clinical trials, it alone cannot solve the malaria crisis. The vaccine is costly to produce, impeding distribution and widespread use. It also requires four separate doses over the course of a year for partial immunity that lasts for a median of four years.[3]

Despite these downfalls, the RTS,S vaccine marks an important advancement towards limiting the prevalence and lethality of plasmodium parasites. In the meantime, preventative measures should continue to be taken in areas of high risk, including the use of insecticide, mosquito nets, fumigation, and medications such as sulfadoxine-pyrimethamine prior to potential exposure.[4]




Graphic by Melody Qian '24

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# WHY GO PARABEN-FREE?

By Semilola Obayomi '23

Today, many consumers have become accustomed to having artificial ingredients and chemicals in everyday items. However, many of these chemicals are harmful to our health. Some ingredients, like parabens, have caused lots of concern from both individuals inside and outside the medical industry due to their effects on human health.

Parabens are man-made chemicals used in hygiene, food, and pharmaceutical products to prevent the growth of fungi, bacteria, and yeast in order to extend shelf life. These chemicals are derived from para-hydroxybenzoic acid (PHBA) which naturally occurs in our bodies through the breakdown of amino acids. The most commonly used parabens in cosmetics, such as methylparaben and propylparaben, are identical to those found in nature and are changed to natural PHBA and eliminated by the human body.[1]

In the U.S., parabens have been widely regarded as safe by numerous agencies, such as the Food and Drug Administration (FDA) and the Cosmetic Ingredient Review (CIR) since the 1970s. In 1984, the CIR concluded that paraben use in cosmetics was safe even in large doses of 25%. However, recent data connecting parabens to cancer has caused the public to be wary of parabens even though the chemicals were safely classified by the FDA again in 2012.[1]

Over the past few years, there has been concern about the correlation between parabens and diseases, such as breast cancer. In a 2010 study, researchers found that long term exposure to parabens could lead to lower hormonal responsiveness and disrupt the creation of reproductive tissues in female rats.1 This research, in addition to studies that have found parabens to be estrogen mimics, has caused many to be alarmed about the connections between parabens and breast cancer.[2] While more research into this topic is needed, there is currently no concrete evidence linking parabens to breast cancer. But, there has been more evidence about other potential dangers caused by parabens. For one, a possible correlation between parabens and an increased risk for endometriosis was discovered in a May 2021 study.[3] Additionally, there has been strong evidence supporting the theory that parabens can be present in our bodies at frequent rates.[4] The potential risks of parabens in personal care products and cosmetics has pushed many customers to purchase paraben-free items instead.

While some still view parabens as safe ingredients, customer concern about the potential dangers of parabens hasn't gone away. As a result, many beauty and cosmetic companies have chosen to develop paraben-free products with customer satisfaction in mind.

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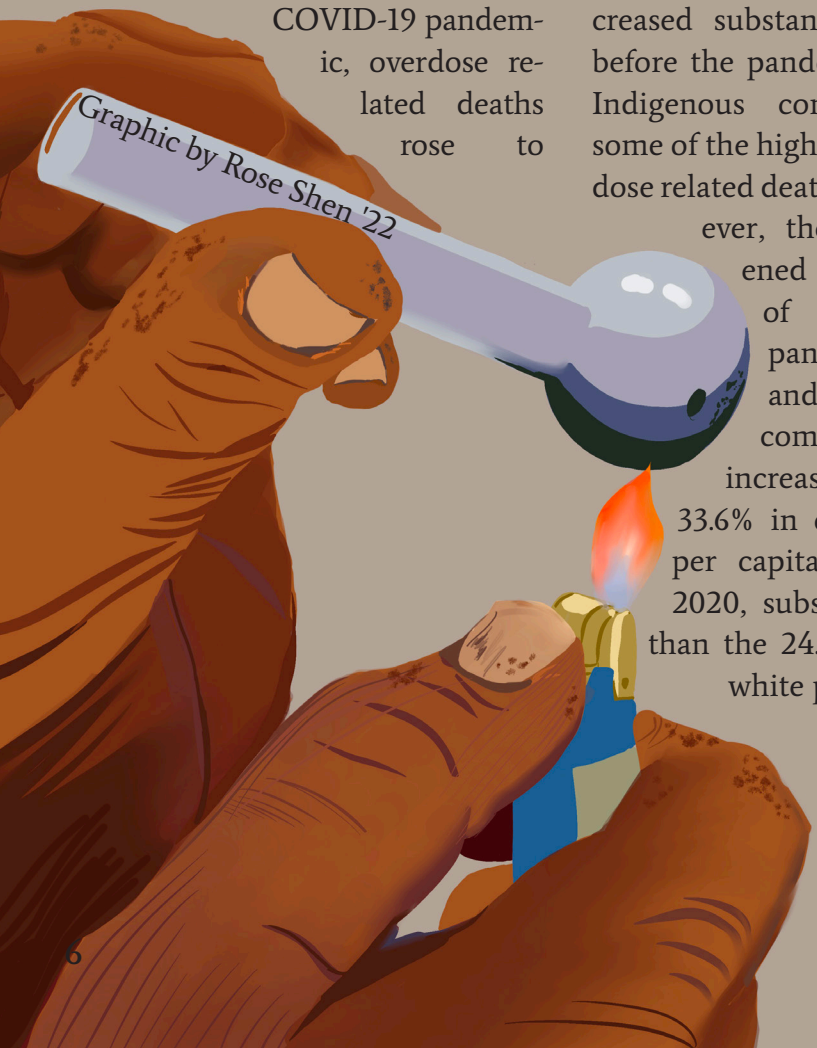
Graphic by Rose Shen '22

# RACIAL DISPARITIE
# SUBSTANCE
# BLACK AND INDIGEN

By Deven H

In recent years, especially during the course of the pandemic, substance abuse has reached a record high: the National Institute on Drug Abuse (NIDA) reports that since 1999, drug-related overdose deaths have increased from under 20,000 to over 70,000 in 2019, with the highest number of deaths resulting from synthetic opioids.[1] During the COVID-19 pandemic, overdose related deaths rose to over 93,000 overall, a 29% increase over the previous year's 72,000. Overdose deaths, at an all-time high, is just one facet that contributed to the deadliest year in U.S. history in 2020.[2]




However, not every demographic in the country was affected evenly; rather, Black and Indigenous communities were impacted the most by the increased substance abuse. Even before the pandemic, Black and Indigenous communities had some of the highest rates of overdose related deaths by race. However, these rates worsened over the course of the COVID-19 pandemic. Black and Indigenous communities saw an increase of 46.8% and 33.6% in overdose deaths per capita from 2019 to 2020, substantially higher than the 24.2% seen by the white population.[3]

There are a number of factors that contribute to this. Firstly, there is still a large disparity in receiving healthcare among BIPOC communities, especially for Black, Latine, and Indigenous peoples — some of it stemming from a general distrust of the system due to historical events (see the Tuskegee Syphilis Study).[4] Although depression is one of the leading reasons for substance abuse, minorities are less likely to receive the mental health care they should. A study from the Substance Abuse and Mental Health Services Administration reported that among those with a mental illness, 46.3% of white people used a mental health service, which is higher than the 41.6% of Indigenous peoples and substantially higher than the 29.8% of Black people. 27.9% of the Black people with a mental illness who didn't receive mental health care cited concerns of prejudice and discrimination.[5] Most medical studies have also been performed with white people as the primary testing group, which means that results are often times more applicable towards that racial group: symptoms of poor mental health could appear

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differently in different races, and culturally appropriate services and treatments have been shown to be more effective in treating BIPOC patients.[6] Using current methods, Black Americans are 3.5–8.1 percentage points less likely than whites to complete treatment for substance abuse, and Indigenous Peoples were 4.7 percentage points less likely to complete alcohol treatment.

Another major factor is the increase in accessibility of drugs in certain communities. In recent years, drugs like methamphetamine have become more accessible in Black and Indigenous communities, affecting them the most. A study found that the number of methamphetamine related deaths in the U.S. rose from 5,526 a year to 15,489 a year. This is an about 180% increase. During the same time period, Black Americans saw a tenfold increase in methamphetamine use, and Indigenous peoples still have the highest rate of methamphetamine use disorder. White Tail, a Cheyenne tribal member who runs the George Hawkins Memorial Treatment Center, says "It's readily available, it's easy to get. I believe it's deeply entrenched across the community — not just in Native communities." The healthcare system has also been focused on the opioid crisis devastating white rural communities, leaving communities of color without resources or attention and vulnerable. It also doesn't help that there are no approved medications to treat methamphetamine use disorder.[7]

While there are countless other factors that could be discussed, such as inaccessibility to healthcare and socioeconomic issues, the factors mentioned above are some of the most prevailing issues contributing to this racial inequity in healthcare. Moving forward, it's important for all doctors, medical professionals, and the medical system as a whole to strive for a system that also caters towards underserved communities and their healthcare needs.

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