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Dear the Choate Community,

Thank you for reading Choate Public Health! With this new issue of the magazine, we would like to introduce ourselves as the next Editor-in-Chief and Managing Editor of the publication. As our previous head editors bid us farewell, we have gradually been introduced to our new roles and responsibilities. We are excited to have been entrusted with this publication and its goal: to facilitate public health awareness on campus. Ranging from informative reports on the newest scientific and technological advancements to more sensitive pieces on the intersections between public health and social justice, we aim to offer the Choate community with a plethora of information and knowledge in order to inspire and educate. Hopefully, we will continue the great work of our previous heads.

For our upcoming issues, we will continue to incorporate a variety of public health articles and cover topics that are of relevance to the Choate community. We have a few ideas in the making that will begin to take shape in the upcoming months, such as increasing the community’s input into our issues, expanding the use of our social media handles, and introducing public health article series. So, please look out for these new additions to the publication!

Given the approaching end of the spring term, we encourage students, faculty, and staff to look after themselves and reach out for support if needed. This year, as a community, we have braved the pandemic together, witnessed a new focus and understanding for our BIPOC community members, and supported each other through pivotal and frightening moments. For that reason, we hope that the bond established this year will last beyond the end of this spring term.

Thank you again for picking up this magazine, even if you may only have time to flip through a few pages. Every word and every page you read is a step closer to a better understanding of public health, and we look forward to taking you along on this journey with every issue.

As always, if any student would like to write for CPH issues, please feel free to reach out to us. We also send out Google Forms sign-ups at the beginning of each term where students can request an article topic or suggest a topic of their choosing. For other forms of contributions, email us.

Sincerely,
Renee Jiang ’22
Linda Phan ’22
Every year, an estimated 2.9 million people are infected with cholera globally, out of which approximately 95,000 people die. A diarrheal illness, cholera is caused by the toxigenic bacteria *Vibrio cholerae* serogroup O1 and O138, which infect the intestine.¹

Because cholera is not likely to spread directly from one person to another, casual contact with an infected person does not transmit the infection. Instead, a person can be infected through the consumption of food or water that has been contaminated with cholera-causing bacteria, most frequently, from the feces of an infected person. As a result, the disease is highly contagious and can spread rapidly in areas with inadequate sewage treatment or a lack of a clean water supply. Since the incubation period for cholera ranges from two hours to five days, the number of cases increases rapidly. Although infection is usually mild or without symptoms, approximately 1 in 10 people who are infected with cholera can develop severe symptoms. These symptoms include diarrhea, vomiting, and leg cramps. All of the symptoms can lead to a rapid loss of body fluids, which in turn can escalate into severe dehydration and shock. This is particularly dangerous as death can occur within hours without treatment.¹

While countries with adequate healthcare and sanitation systems have been able to completely eradicate cholera, it remains a deadly reality for developing countries such as Yemen. Since 2016, Yemen has suffered from a cholera epidemic that has marked one of the worst cholera outbreaks in history. In 2017 alone — which was when the epidemic reached its highest peak — the country recorded over 1.1 million suspected cases of cholera. From October 2016 to December 2020, the country recorded over 2.5 million suspected cases of cholera, including 3,981 related deaths.² According to the World Health Organization (WHO), approximately one-third of the cases are children under the age of five.³ Various factors have contributed to the cholera epidemic in Yemen. At the moment, Yemen is facing one of the worst humanitarian crises ever in history. The conflict started in 2015 between Yemen’s Houthi rebels and a Saudi-led coalition. Before the war broke out, 50% of the population was already deprived of proper access to sanitation and healthcare systems, and malnutrition was prevalent in the country.⁴ The conflict has only exacerbated the cholera epidemic, as
3.3 million people have been displaced. These displaced individuals primarily live in precarious conditions with little to no access to sanitation or healthcare. According to relief officials, almost 80% of the population needs protection and assistance. Although death, injury, and displacement are frequent during wartime, the repercussions of a lack of healthcare and sanitation have become far more dangerous.

Medical facilities and water supply infrastructures have been destroyed in bombings. In September 2016, less than 50% of hospitals were still in operation. The additional air and naval blockade has caused a famine for over 14 million Yemenis. With a lack of food, people’s immune systems have weakened. To make matters worse, both sides of the conflict exhausted most of the public expenses in order to fund the war. The situation has been worsened by blockages and severe fuel, drinking water, food, and medication shortages.

The cholera epidemic started when the war reached its pinnacle. Accumulated garbage contaminated the water system, which millions of Yemenis consumed. Additionally, sewage, drainage systems, and treatment plants all failed to function. As a result, underground water was contaminated with sewage in all Yemeni cities. Wastewater spread across the country and even contaminated crops.

Yemen’s current situation has been considered the worst man-made humanitarian crisis in the world by the United Nations (UN). Even though the country has been receiving foreign aid, it is still not enough to put an end to the cholera epidemic. Recently, the COVID-19 pandemic has only worsened the already precarious situation. This past March, the Saudi government presented a peace initiative intended to resolve their long-standing strife with Yemen. Although this does not immediately initiate the end of the conflict, it has given many Yemenis hope that the conflict, famine, cholera pandemic, and collapsed health system will take a turn for the better.

Sources
6. ‘Saudi Arabia has lost the war in Yemen.’ DW. Published March 25, 2021.
Fires have long posed a threat to our homes, families, and environment, especially in places with arid climates. From house fires to forest fires, the destructive element has created a problem for which we have been attempting to solve for ages. Whether it is the use of water, fire extinguishers, controlled burns, or special chemicals, humans have been looking for ways to prevent and control fires for centuries. However, some of these techniques have been discovered to create negative impacts on the environment as well as adverse health issues. In particular, the use of flame retardants has come under scrutiny.

So, what are flame retardants? Like many other fire preventers, flame retardants are a type of chemical that, when applied to a material, helps to avert or minimize any damage caused by a fire. Used on a wide variety of things including but not limited to furniture, electronics, electrical devices, and construction materials, flame retardants appear frequently in everyday life. These chemicals are categorized based on their effects and chemical structures. The most commonly used retardants are called “brominated flame retardants” such as Polybrominated diphenyl ethers (PBDE), Tetra-bromobisphenol A (TBBPA), and Hexabromocyclododecane (HBCD). These retardants cause numerous problems due to their tendency to build up in bodies of water, infecting water sources and exposing consumers to health concerns. Some other common flame retardants include Tris(1,3-dichloro-2-propyl)phosphate (TDCPP) and Firemaster 550. These chemicals come with a host of possible health issues including cancer, endocrine disruption, metabolic effects, lower birth weight, and impaired neurological development.

Troublingly enough, nobody is safe from these harmful flame retardants. Dr. Ann Vuong, who researches PBDEs (a type of flame retardant) and their health impacts, says that “everyone is exposed to PBDEs, everyone has levels of PBDEs in their bodies.” People are typically exposed to these flame retardants when their chemicals are released into dust and the air, which in turn
are transferred to our hands or food. This increases the risk of flame retardants for children, since they have a tendency to put their hands near their mouths and are lower to the ground. Another way we are exposed is through the burning of these chemicals, which exposes firefighters to more health risks in their occupations. Furthermore, the manufacturing of flame retardants often spreads the chemicals throughout our air, soil, and water. Clearly, we are in danger of exposure to these toxic substances in many ways on a daily basis.

The good news is that health professionals are realizing these adverse health effects and are working towards change. For one, National Institute of Environmental Health Sciences (NIEHS) researchers are developing alternatives that are less harmful to the environment and human health while also studying the toxicity of different flame retardants. The Green Science Policy is working with large manufacturers and companies to limit and reduce the number of harmful flame retardants being used. In Massachusetts, a new law has recently passed banning the use of certain flame retardant chemicals in many common items such as bedding, children’s products, carpeting, and furniture. In Minnesota, a similar law passed in 2019. Several other states have followed suit by banning the chemicals prevalent in these fire retardants.

While flame retardants are not being produced and used at the rate they once were, these chemicals are still a very real threat that exists in today’s market. Some things you can do to limit your own exposure to these detrimental chemicals are looking at labels when you buy furniture (specifically labels stating the lack of flame retardants), looking for children products that are made of polyester or wool, and cleaning dust from your house often. On top of these things, washing your hands often and avoiding household materials that use polyurethane foam would help as well. Overall, the disadvantages of flame retardants heavily outweigh the benefits, and some research is even beginning to re-examine these benefits. So, are these “flame retardants” really worth the health issues that come with them? The answer is a resounding no.

Sources
Flame Retardants Fact Sheet. National Institute of Environmental Health Sciences. Published July 2016.
Particulate matter, or PM, is the mixture of solid particles and liquid droplets suspended in the air. Dust, soot, and smoke are some examples of particulate matter that are large enough to be seen with the naked eye. Particulate matters are often measured by their diameters. For example, PM$_{10}$ refers to particles that are about ten micrometers in diameter, while PM$_{2.5}$ indicates particles smaller than or equal to 2.5 micrometers in diameter — a whopping thirty times smaller than an average strand of human hair!

While forest fires or other natural sources can produce PM$_{2.5}$, larger concentrations of the matter are man-made. Vehicle emissions, industrial pollutants, and chemical reactions of gases such as sulphur dioxide (SO2) and nitrogen oxides (NOx) are all accountable for most of the PM$_{2.5}$ we are exposed to today.

Due to its small size, PM$_{2.5}$ is omnipresent and can be easily inhaled into our lungs. As it travels through our blood vessels, it can cause both lung and heart conditions. While long term exposure to PM$_{2.5}$ can lead to permanent respiratory problems such as chronic bronchitis and heart disease, short term exposure to PM$_{2.5}$ can cause irritation in the eye, nose, and throat, in addition to coughing, sneezing, and shortness of breath.¹ A meta-analysis of different studies reveals that short term exposure to PM$_{2.5}$ is strongly associated with respiratory afflictions, whereas long term exposure causes more severe cardiovascular conditions.² Research has shown that an increase of every 10 μg/m$^3$ (microgram per cubic meter of air) of PM$_{2.5}$ is accompanied by a 16% increase in chances of childhood asthma, a 26% increase in chances of lung cancer, and a 44% increase in chances of heart attacks.³ PM$_{2.5}$ can significantly affect quality of life, especially for children, the elderly, and those with predisposed respiratory and cardiovascular diseases.⁴

To combat this urgent environmental issue, the Environmental Protection Agency (EPA) was created to establish, monitor, and enforce national guidelines regarding pollution prevention. Since the Clean Air Act of 1970, the EPA has been initiating and methodically renewing PM standards to specifically address PM$_{2.5}$. To adapt to the ever-changing air quality, the EPA is required to review and revise PM$_{2.5}$ standards quinquennially. For example, the annual standard was adjusted from 15 μg/m$^3$ in 1997 to 12μg/m$^3$ in 2012. The daily 24-hour standard was set as 65

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μg/m³ in 1997, but revised to 35 μg/m³ in 2006.5

To assist states and corporations in reaching these standards, a series of regulations and programs have been implemented. One prominent example is the General Conformity Rule, which states that plans and actions by federal agencies, like airport construction, should follow the state’s plans and actions to uphold national air quality standards. Relating to industrial activity, the Mercury and Air Toxics Standard (MATS) limits the emission of mercury from power plants.6 Similarly, in China, where PM₂.₅ has caused a significant plight in the past decade, the government has been issuing regulations to control coal use, industrial pollution, and vehicle emission.7

PM₂.₅ is the major source of air pollution, mainly caused by our urban lifestyle that relies on industrial activities and fuel-powered locomotion. Not only does the small size of PM₂.₅ allow it to infiltrate our bodies, but its omnipresence also makes it harmful with both short and long term exposure. While governments and companies are actively working towards a solution for cleaner air, we can all help alleviate this pressing issue by reducing our own carbon footprints — shopping with reusable bags, unplugging devices when not in use, or simply driving less. It is only reasonable for our generation to improve our own living environment and provide the most optimal condition for generations to come.

Sources


5. What are the Air Quality Standards for PM? EPA. Updated October 11, 2019.


In the past year, companies including Johnson and Johnson, Pfizer, and Moderna raced to manufacture COVID-19 vaccines, begin clinical trials, gain approval, and distribute it to the public. However, the rush to release COVID-19 vaccines for public use raised concerns of whether or not they were safe to be administered. The Oxford-AstraZeneca vaccine, in particular, has made headlines for the potential health complications following its administration, which ultimately led to the ban of the vaccine in numerous countries.

In May of 2020, a licensing agreement was created between the University of Oxford and AstraZeneca PLC to create a potential vaccine that would initially be administered in the United Kingdom. With this agreement, AstraZeneca could go on to produce a supply of one billion doses through funds provided by the University of Oxford. Other countries could also reserve the vaccines. The United States, for example, reserved 300 million doses. Another 300 million doses would be distributed by the COVID-19 Vaccines Global Access (COVAX), an initiative that works to share vaccine supplies to countries in need. Overall, this agreement was a stable plan for the future, and in July of 2020, clinical trials began.1
Enrollment for adults in the clinical trials opened on August 31, 2020. The process was suspended multiple times due to suspected adverse effects in trial participants. Once it was concluded that the participants’ health conditions were not related to the vaccine, clinical trials resumed. In November 2020, data regarding the vaccine’s efficiency was released by Oxford University and AstraZeneca. In February 2021, data showed that the vaccine has an efficiency of 76% at preventing symptomatic COVID-19 infection beginning at 22 days following the first dose, which increased to 81.3% when the second dose was administered 12 weeks or more after the first. Soon, the vaccine was ready to be rolled out.

However, shortly after the beginning of vaccine distribution, a series of thrombotic, or blood clotting, events appeared in patients. According to AstraZeneca, there have been 15 events of deep vein thrombosis and 22 events of pulmonary embolisms reported among those who received the vaccine across the European Union and UK. Although the chance of blood clotting is small, the news of the possibility set panic in many countries even though about 17 million doses had already been administered. On March 11, 2021, Austria, Denmark, Norway, and Iceland announced that they would temporarily suspend the use of the vaccine. Thailand, Indonesia, Venezuela, Italy, and the Democratic Republic of the Congo followed suit and swiftly halted the distribution of the vaccine. While the ratio of blood clots to population was normal, it did not stop governments from scrutinizing the accuracy of the clinical trials.

U.S. health officials began to question the data that was collected during the vaccine’s clinical trials and made accusations towards the company for “cherry-picking” information for the vaccine’s success. Initially, the virus was reported to have a 79% effective rate, but other scientists argue it is closer to 69%-74%. Health representatives also spoke out on the credibility of the vaccine. German health minister Jens Spahn defended the country’s decision to halt the vaccine’s distribution, saying, “The most important thing for confidence is transparency.”

However, stopping the vaccine’s rollout may result in a dangerous delay in containing the spread of COVID-19, according to Dr. Micheal Head, a senior research fellow at the University of Southampton. “This results in delays in protecting people, and the potential for increased vaccine hesitancy, as a result of people who have seen the headlines and understandably become concerned,” said Dr. Head. Despite the doubts and fear surrounding the vaccine, data showed that the reported blood clots were not directly related to the vaccine. Dr. June Raine, the Chief Executive for the Medicines and Healthcare products Regulatory Agency in the UK, stressed that the “benefits of COVID-19 Vaccine AstraZeneca in preventing COVID-19 infection and its complications continue to outweigh any risks, and the public should continue to get their vaccine when invited to do so.” On March 19, the EU’s top drug regulator confirmed the vaccine officially safe and effective.

Today, numerous countries in the EU have restarted the rollout process and are working hard to safely administer the vaccine to as many people as possible.

Sources


4. Ellyatt H. Denmark, Norway, and Iceland suspend use of AstraZeneca Covid vaccine over reports of blood clots. CNBC. Published March 11, 2021.


In 1950, the National Association of Real Estate Boards published in its Code of Ethics that a realtor should be selective when introducing individuals into a neighborhood. Examples of undesirable individuals “whose presence will clearly be detrimental to property values” included “madams, bootleggers, gangsters, and a colored man of means who was giving his children a college education and thought they were entitled to live among whites.”

While the language may be disturbing to the present-day audience, racial discrimination in real estate and mortgage lending was all too common during the first half of the 20th century.

The Federal Housing Administration (FHA) introduced its prejudicial policy of redlining in the early 1930s to increase the number of affordable homes. They used red-highlighted “Residential Security” maps created by the Homeowners’ Loan Corporation (HOLC) to inform realtors, loan officers, and appraisers about areas that were predominantly consisted of low-income Black and Latino populations and were therefore deemed too risky or “hazardous” to insure. As a result, minorities were denied home loans in white neighborhoods and home insurance in minority neighborhoods.

The inability of people of color to secure home loans or home insurance resulted in lasting consequences in education, wealth, and health. Without funds to refurbish, rebuild, or relocate, minorities remained in their “hazardous” communities, suffering from overcrowding, poor air and water quality, increased pollution, insufficient sanitation, and dilapidated housing conditions.

A study conducted by the National Community Reinvestment Coalition (NCRC) shows that these segregationist policies led to greater health disparities in the affected communities. Examples include a higher risk of death from asthma, chronic obstructive pulmonary disease, obesity, and stroke. Statistically, an increase in the redlining of a particular community is accompanied by a decrease in its overall health.

There are three primary reasons for health inequalities among those in historically redlined areas: an increase in health issues among children; a lack of access to quality health care; and a pronounced exposure to environmental risks.

Statistically, an increase in the redlining of a particular community is accompanied by a decrease in its overall health.

Chronic childhood health problems are especially prevalent in redlined communities due to poor nutrition, exposure to secondhand smoke, and a lack of facilities to promote a more active lifestyle. Low-birthweight babies are at risk for rehospitalization, growth problems, sickness, developmental delays, and death within their first year of life. Additionally, poor housing quality and prolonged exposure
to secondhand smoke exacerbates chronic diseases, such as asthma. A higher risk for obesity and high blood pressure can also be correlated to a lack of safe playgrounds, parks, or organized sports for children in redlined communities.  

Air pollution from local landfill or toxic waste treatment facilities — often situated near historically redlined communities — can lead to a range of health problems. On average, minorities living in these areas are exposed to 38% more noxious chemicals than those in white communities, resulting in an increase in respiratory ailments among minorities and a decrease in average life span.

The COVID-19 pandemic has further highlighted the disparities in healthcare in previously redlined areas. “Disparities in COVID-19 infection and illness severity are a result of widespread social and economic inequities produced by structural racism,” said Dr. Helen Meier of the University of Wisconsin. According to a NCRC study published in September 2020, low-income minorities living in formerly redlined areas are more susceptible to having COVID-19 complications. The American Public Media’s Research Lab’s ongoing Color of Coronavirus project also shows that individuals of color are dying from COVID-19 at rates 3.6 times higher than white individuals.

Overlaying the original redlined HOLC maps with corresponding maps depicting public health data sheds light on the effects discriminatory redlining practices of the 20th century have on past and current health disparities among racial minorities. While these prejudicial policies of redlining have since been banned, its impacts on racial minorities still remain. Therefore, new policies and regulations should be implemented in order to directly combat these ramifications that continue harming those that live or have lived in historically redlined communities.

Sources
In the United States, there are three FDA-approved vaccines for COVID-19: Moderna, Pfizer-BioNTech, and Johnson & Johnson. On February 27, 2021, the FDA approved the Johnson & Johnson (J&J) vaccine for emergency use.\(^1\)

The J&J vaccine is a single-dose vaccine manufactured by Janssen Pharmaceuticals under of Johnson & Johnson. This is the first single-dose vaccine that has been approved by the FDA. The J&J vaccine differs from the other vaccines in three ways: technology used to build immunity, handling method, and efficacy rates.

First off, the J&J vaccine uses viral vector technology, which delivers instructions to our cells (in the form of a gene) for the production of antigens.\(^2\) Antigens trigger an immune response to create antibodies against any given virus and, in this case, COVID-19.\(^3\)

Secondly, in terms of storage, the J&J vaccine can be kept in regular refrigerators (between 36°F and 46°F).\(^4\) Other vaccines are kept in freezers at 0 °F.

Lastly, in the U.S., the J & J vaccine is 72% effective at preventing all regular cases of COVID-19 and 86% effective against severe cases.\(^5\) Despite being slightly lower than the other approved vaccines’ efficacy rates, it is still safe for distribution and effective at preventing hospitalization.

Despite these differences between the J&J vaccine and other COVID-19 vaccines, the variations are slight. Currently, the J&J vaccine is available for widespread distribution across the U.S. for anyone over the age of 18. After a few patients were recorded of having blood clots, the U.S. put a pause on the vaccine distribution, but has since continued on with the distribution.

Sources


MAXIMIZE THE BENEFITS OF NAPPING

By Heidi Small '23

Oftentimes, students tend to feel exhausted by mid-afternoon, and a lack of sleep only perpetuates that feeling. Research suggests that napping is an effective antidote for fatigue and can help combat inadequate sleep in addition to boosting neurocognitive function. Napping benefits the brain by improving alertness and attention since it can restore the body from insufficient sleep and increase one's ability to retain information. A study conducted at the University of California, Riverside in 2008 reported that those who took an afternoon nap performed the same, if not better, than those who consumed caffeine instead.¹

While napping brings many positive benefits, such as the revitalizing of brain functions and learning capabilities, it is important to distinguish between napping and over-napping. Excessive napping can lead to unfavorable effects, such as a disrupted circadian rhythm. Long naps may result in insomnia or interference in night sleep quality.² They can also cause disorientation and the feeling of grogginess upon waking up.

Napping at an appropriate time, like early or mid-afternoon instead of early mornings or close to bedtimes, is especially crucial to deriving the benefits of napping. While an ideal duration has not been firmly established, researchers suggest a range between 30 to 90 minutes, depending on the napper’s sleep cycles and body. Finding a dark, quiet place to rest is also important in order to achieve the optimum benefits of napping.³

So, the next time you feel the inevitable urge to take a nap, consider the time of day, duration, and location of a nap to ensure that you’ll feel more alert, energized, and refreshed after this brief break.

Sources


Graphic by Rose Shen '22
Undocumented immigrants are individuals residing in a country without authorization. In the United States, immigrants account for 4 out of 10 non-citizens, including those who have stayed in the country past their visa expiration or entered the country without proper authorization. Despite paying billions of dollars of taxes annually and taking on unpreferable jobs, this population struggles with receiving proper health care, specifically, access to health insurance.

While there are many federal healthcare programs, such as Medicare, Medicaid, and CHIP, undocumented immigrants are ineligible for enrollment. Only in certain cases can undocumented immigrants get private coverage through their employer or as a spouse or dependent of an employee. They can also independently purchase private healthcare coverage, but this is not a viable option due to its high price. According to a study conducted by the Migration Policy Institute in 2011, only 29% of undocumented immigrants had private or employer-provided health insurance, and 71% reported that they had no healthcare coverage at all.

The only federal insurance offered to undocumented immigrants at this time is emergency care under Medicaid. This covers “patients in active labor and those with acute medical emergencies.” After a patient is stabilized, they are not covered for any services afterward, forcing them to make difficult choices. Because of the added costs due to the lack of insurance, many undocumented immigrants delay treatment and refuse to seek help. Having health insurance is a large determinant in if and when a person seeks medical attention. Because many undocumented immigrants do not have health insurance, they are reluctant to seek medical care, leading to further health complications and costlier treatments down the road. For example, cervical cancer is increasing among female immigrants but decreasing among female U.S. citizens. This demonstrates the inability of undocumented immigrants to access care that would properly combat health concerns such as cervical cancer.

Forward-thinking states, such as California, Illinois, and Massachusetts, have been using state funds to provide health insurance coverage to “income-eligible children regardless of immigration status.” The expansion of healthcare to include all undocumented immigrants is the next step towards granting the necessary healthcare to as many U.S. residents as possible.

Today, the U.S. remains in a political debate.
over whether or not free healthcare should be provided for undocumented immigrants. Those who oppose feel that using taxpayer money to fund an unauthorized population undermines the legal system. Additionally, many are afraid that resources would be taken away from U.S. citizens if they are provided to undocumented immigrants.

In contrary to a widespread belief that undocumented immigrants do not contribute to the U.S. economy, the population pays approximately $12 billion in state and local taxes each year, supporting Social Security funds, governmental health insurance programs, and local infrastructures. They also play a large role in the nation’s food supply chain by making up 10% of the food industry, encompassing food production, processing, distribution, and retail. According to a study conducted by the Pew Research Center, undocumented immigrants fill in occupations that 77% of Americans do not want, making up 14% and 12% of agricultural and construction jobs, respectively.

Lawmakers have further argued that it is both unethical and immoral to deny undocumented immigrants the right to access healthcare. This view treats healthcare as a human right in order to maintain order within society. The long-standing debate has made undocumented immigrants the center of both an economic and ethical battle for what should be a basic right. Even though a few states have started to provide more healthcare coverage options, more steps need to be taken to ensure that undocumented immigrants receive the care they deserve.

Sources


By definition, vitamin D is actually not a vitamin. Its distinct ability to be produced inside the body is what makes this “vitamin” different from other vitamins. One commonly known way in which vitamin D is produced is through sunlight: ultra-violet rays hit the skin cells of the body, providing the energy to synthesize the vitamin. Other ways of obtaining vitamin D are through the consumption of fatty fishes, mushrooms, fortified milk, egg yolks and cheese. Although it is best to obtain the vitamin from natural sources, supplements can also provide the extra nutrients necessary to meet a healthy requirement.¹

Vitamin D is a nutrient that regulates the absorption of calcium in the intestines. Calcium plays an important role in the development of bones and teeth, and it is also a critical mineral necessary for a strong immune system.² Therefore, a vitamin D deficiency could eventually increase the risk of several bone abnormalities, such as osteomalacia (soft bones) or osteoporosis (fragile bones), as well an increased vulnerability to certain diseases. On the other hand, excess vitamin D, usually from too many supplements, could lead to the over-calcification of bones and blood-hardening in vessels, kidney, lungs, and heart tissue.¹

Vitamin D intake is measured in micrograms (mcg) or international units (IU), where one microgram equals 40 IU. The recommended daily intake of vitamin D differs between individuals based on their age: infants up to 12 months are recommended 400 IU or 10 mcg, children and adults up to 70 years old are recommended 600 IU or 15 mcg, and adults over seventy are recommended 800 IU or 20 mcg.³ For most people, exposure to sunlight and food consumption should provide enough vitamin D to maintain a healthy life. However, it is always important to be aware of personal requirements and intake.

Sources
Parkinson’s disease is a neurodegenerative disorder caused by dopamine deficiency that affects more than 10 million people worldwide. The neurodegenerative disorder progresses gradually, taking months and sometimes even years until symptoms such as stiffness, tremor, slowness, and balance issues become apparent enough for an individual to seek help from a physician. Without any specific molecular test for the condition, diagnosis is generally based on an individual’s medical history and a neurological examination. Reports have shown that by the time a formal diagnosis is made, an estimated 60-80% of dopamine-producing cells in the brain are already lost.

Recently, a team of scientists led by Professor Perdita Barran from The University of Manchester and the clinical lead Professor Monty Silverdale at Salford Royal Foundation Trust have developed a technique to detect certain compounds found in sebum — the oily substance that protects the skin. They discovered that individuals with Parkinson’s can have abnormally high concentrations of sebum, indicating a condition known as seborrhoea. The research originated from observations made by retired nurse Joy Milne, who noticed an unusual musky scent on her husband years before his Parkinson’s medical diagnosis. By performing different mass-spectrometry methods on 500 people with and without Parkinson’s, the research team has identified 10 chemical compounds in sebum that are elevated or reduced in people with Parkinson’s. These chemical compounds can serve as biomarkers for Parkinson diagnosis. Further studies published in Nature Communications have also shown a ground-breaking discovery in using high resolution mass spectrometry to track the fundamental changes as the condition gradually progresses, including lipid dysregulations and altered mitochondrial functions.

Ultimately, these promising results have encouraged the team to further their research in developing an accurate and efficient diagnosis test that can be used in the National Health Service. With access to a system of diagnosis, Parkinson’s can be screened for early on, before dopamine-producing cells in the brain are lost. Patients can then undergo preventative treatment before the disease progresses even further.

Sources
5. Scientists move closer to developing ‘game-changing’ test to diagnose Parkinson’s. Science Daily. 11 March 2021.
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