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# CHOATE PUBLIC HEALTH



WINTER MINI ISSUE

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# PUBLIC HEALTH REVIEW

## EYE ON AS WE

By Claire

With a new year comes a not-so-new list of major public health crises that need to be watched and tackled. Here are the top issues that everyone should look out for in 2023:

The COVID-19 pandemic is a battle the world has been fighting for over three years, and it's safe to say that we are nowhere near the end of it. Despite being a major topic of discussion across the globe and resulting in extreme safety measures and policies, it is still a crisis that requires urgent attention. In fact, the pandemic has recently circled back to where it was originally detected in 2019, China.<sup>1</sup> Over the past few years, China's zero-Covid policy was successful in keeping cases to a minimum, even when other parts of the world suffered from skyrocketing case numbers and deaths. However, this meant that people in China were forced to stay inside their homes on strict lockdown. Recently, people began protesting these measures, forcing the government to loosen all restrictions. With a struggling healthcare system and an undervaccinated population, the number of COVID cases in China is quickly climbing up again. Especially during the Lunar New Year holiday, millions are travel-

ing to reunite with their families, increase the spread of the virus across the country. The Economist predicts that there could be up to 1.5 million deaths in China over the next few months. This resurgence of cases in China is not something the rest of the world can just sit back and watch. The virus spreading through millions of people again will only allow it to evolve and create new variants that could affect numerous other countries. Not to mention, this could have serious consequences on the global economy, should there be another worldwide lockdown.<sup>1</sup>

In addition to the COVID-19 virus, lower respiratory infections, specifically respiratory syncytial virus (RSV) and influenza are public health concerns that need to be monitored in 2023.<sup>4</sup> Although there was a decrease in these infections during 2020 because widespread face mask usage and social distancing practices, lower respiratory infections are returning as these restrictions loosen. Prior to the pandemic, RSV was known to be a winter virus, bringing cold-like symptoms to most people, but being especially dangerous for young children. But over the past two years, it has begun to

surge in the late summer and autumn months.<sup>1</sup> The United States has recently seen an outbreak of RSV in younger children who were never exposed to the virus before.<sup>5</sup> Combined with a shortage of healthcare workers due to "pandemic-era burnout", many hospitals were at their breaking point as infant hospitalization rates doubled in the final months of 2022, with RSV being the leading cause of these escalating numbers, according to the CDC. Multiple countries have also reported an increase in influenza, affecting all age groups.<sup>4</sup> Despite having little transmission in the 2020-2021 season, the flu returned unexpectedly early for the 2022-2023 season. With multiple viruses behaving differently post-COVID, it's especially important to keep an eye out for more changes in 2023.

Cardiovascular diseases are the leading cause for death around the world.<sup>4</sup> In 2021, they accounted for approximately 28% of total deaths. Cardiovascular diseases refer to a number of medical conditions that affect the heart and blood vessels, including heart disease, stroke, and heart attack. These conditions affect almost 50% of adults in the United States, regardless of age, sex, and

# W: WHAT TO KEEP AND MOVE INTO 2023

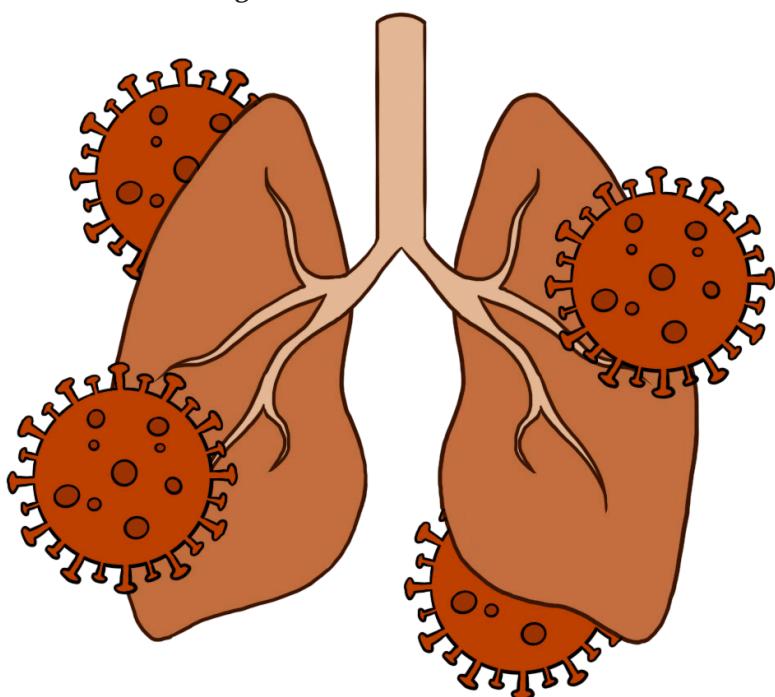
Liu'24

ethnicity. There are many available treatment plans depending on the situation, such as medications, lifestyle changes, and surgery.<sup>2</sup> However, in a study published by Journal of the American College of Cardiology, cardiovascular disease rates are predicted to increase significantly by 2060. These concerns are at the forefront of global public health and continue to urge for more equitable access to treatments.<sup>6</sup>

Lastly, an essential part of public health that sometimes goes unnoticed is mental health. The impact of mental illnesses extends far beyond emotional and psychological well being and can often affect the physical body as well. Especially since 2019, the pandemic has caused an increase in anxiety, depression, and other disorders worldwide. Mental Health America reports over 50 million people experiencing some degree of mental illness between 2019 and 2020.<sup>3</sup> The WHO recommends that countries promote care for mental health by making resources and support widely available to everyone.<sup>7</sup> Spreading awareness for mental illness, and all of these major crises, is the first step to improving worldwide public health in 2023.

## Sources

1. Branswell, H. (2023, January 4). 3 challenges to watch in Global Health in 2023. STAT. Retrieved January 21, 2023, from <https://www.statnews.com/2023/01/04/3-challenges-to-watch-in-global-health-in-2023/>
2. Cleveland Clinic. (2022, September 1). Cardiovascular disease: Types, causes & symptoms. Cleveland Clinic. Retrieved January 21, 2023, from <https://my.clevelandclinic.org/health/diseases/21493-cardiovascular-disease>
3. Coursera. (2022, December 20). 6 public health issues to know in 2023 + jobs tackling them. Coursera. Retrieved January 21, 2023, from <https://www.coursera.org/articles/public-health-issues-to-watch-in-2023>
4. IHME. (2022, December 20). 11 global health issues to watch in 2023, according to IHME experts. Institute for Health Metrics and Evaluation. Retrieved January 21, 2023, from <https://www.healthdata.org/acting-data/11-global-health-issues-watch-2023-according-ihme-experts>
5. Kimball, S. (2022, November 18). Children's hospitals call on Biden to declare emergency in response to 'unprecedented' RSV Surge. CNBC. Retrieved January 21, 2023, from <https://www.cnbc.com/2022/11/18/biden-asked-to-declare-emergency-over-rsv-flu-kids-hospitalizations.html>



Graphic by Stephanie Wang '23

# THE PROMISE OF DIGITAL REVOLUTION TO

By Sebastian

Digital health is an emerging field that leverages technology to improve healthcare. In recent years, there has been a significant increase in the use of digital health tools and platforms, and this trend is expected to continue. We can expect to see even more advancements in the field of digital health that will revolutionize healthcare. This year, digital health technologies, such as telemedicine, remote monitoring, and artificial intelligence, will continue to revolutionize healthcare.

Telemedicine allows patients to consult with their healthcare providers remotely, using video conferencing, phone calls, or messaging. Telemedicine has been particularly beneficial during the COVID-19 pandemic, as it has allowed patients to receive medical care while avoiding in-person visits to hospitals and clinics. In recent years, telehealth has seen an increase in its usage during COVID-19, where a study claims that "in 2019, only 1% of visits to behavioral health specialists were telehealth; in 2020, the percentage jumped to 38.1%. By the end of 2020, telehealth visits to

behavioral specialists were as common as in-person visits."<sup>1</sup> During COVID-19 alone, telehealth visits increased by 38%. As telehealth starts to become more normalized, we can expect an increase in the number of health visits through technology.

Another important development in digital health is the use of remote monitoring. Remote monitoring allows healthcare providers to remotely track patients' vital signs, such as blood pressure and heart rate using wearable devices or smartphone apps. This allows healthcare providers to monitor patients' health in real-time and intervene if necessary. Remote monitoring allows people to live their daily life without having to put a pause on it for their healthcare. "Remote patient management is ... about moving more healthcare out of the traditional setting, into the house and where people live, work and play every day,"<sup>2</sup> the benefit to this type of patient care is the ability to combine the home with the doctor's office. This type of monitoring is one of the best ways to prevent further health complications

from occurring.

Digital health is an emerging field that is revolutionizing healthcare. In 2023, we can expect to see even more advancements in the field, specifically artificial intelligence, that will improve patient outcomes and make healthcare more accessible. Digital health opens many doors to people and it has the ability to reach marginalized communities who might not always be able to go to a clinic. However, challenges in implementation and access must be addressed to fully realize the potential of these technologies.

## Sources

1. Melissa Suran, "Increased Use of Medicare Telehealth During the Pandemic," *Jama*, last modified January 25, 2022, accessed January 22, 2023, <https://jamanetwork.com/journals/jama/fullarticle/2788367>.
2. "What Is Telehealth? What Is Remote Patient Monitoring? How Are They Different?," *careinnovators*, accessed January 22, 2023, <https://news.careinnovations.com/blog/what-is-telehealth-what-is-remote-patient-monitoring-how-are-they-different>.

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# UNDERAGE VAPING USE PLU

By Emily



Graphic by Yujin Kim '23

# Vaping and E-Cigarette Summers

Vance '25

In recent years, the prevalence of vaping and e-cigarette usage among adolescents in the United States has seen a marked increase. However, recent data indicates that this trend may be reversing. This shift is likely the result of growing awareness among teenagers about the potential dangers of vaping and the observable negative effects on those around them. Notably, the decline in usage among middle school students has been particularly pronounced. A national survey conducted by NBC revealed that the percentage of high school students who admitted to recent use of vapes or e-cigarettes decreased from 28% to approximately 20%, while the percentage of middle school students who reported such usage dropped from 11% to 5%. Overall, the number of school-aged children using vapes decreased by 1.8 million within a one year period.<sup>1</sup>

In the realm of underage e-cigarette use, flavored products are heavily credited as the drive of this epidemic. In response, the U.S. Food and Drug Administration issued an enforcement against certain unauthorized flavored e-cigarettes.<sup>2</sup> Juul recently withdrew all their flavors of vapes before a federal investi-

gation took action against them, only releasing two authorized flavors—menthol and tobacco. By prioritizing enforcement against such products, the FDA strives to limit adolescent's access to them—so-called flavored vapes that are appealing to the taste and easy to use.

In 2023, the percentage of high school students who reported recent usage of vapes or e-cigarettes has decreased to 14.1%; a stark contrast to that of 2019 (28%).<sup>3</sup> While it is essential to acknowledge that these findings are encouraging, there remains a need for continued efforts to combat the vaping epidemic among adolescents. Kenneth Warner, a professor emeritus at the University of Michigan's school of public health, shows concern that there might be a spike in users following this decline.<sup>4</sup> As such, preventing a resurgence in vape and e-cigarette usage, particularly in light of the production of dangerous disposables and flavored e-cigarettes that are often marketed towards the youth, should be an imperative concern. It is important to continue to monitor trends in usage and to implement effective policies to curb the appeal of these products.

## Sources

1. The Associated Press. "Big Drop Reported in Vaping by U.S. teenagers." NBC, September 10, 2020. Accessed January 20, 2023. <https://www.nbcnews.com/health/vaping/big-drop-reported-vaping-u-s-teenagers-n1239723>.
2. FDA, comp. Results from the Annual National Youth Tobacco Survey. December 20, 2022. Accessed January 20, 2023. [https://www.fda.gov/tobacco-products/youth-and-tobacco/results-annual-national-youth-tobacco-survey#:~:text=2022%20Findings%20on%20Youth%20E%2DCigarette%20Use,-In%20October%202022&text=14.1%25%20\(2.14%20million\)%20of,reported%20current%20e%2Dcigarette%20use](https://www.fda.gov/tobacco-products/youth-and-tobacco/results-annual-national-youth-tobacco-survey#:~:text=2022%20Findings%20on%20Youth%20E%2DCigarette%20Use,-In%20October%202022&text=14.1%25%20(2.14%20million)%20of,reported%20current%20e%2Dcigarette%20use).
3. The Learning Network. "Vaping." The New York Times, October 28, 2022. Accessed January 20, 2023. <https://www.nytimes.com/2022/10/28/learning/vaping.html?searchResultPosition=1>.
4. FDA, comp. Results from the Annual National Youth Tobacco Survey. December 20, 2022. Accessed January 20, 2023. <https://www.fda.gov/tobacco-products/youth-and-tobacco/results-annual-national-youth-tobacco-survey>

# ENGINEERING A BETTER FEMTECH RISE

By Kay

Engineering innovations in female health technology, including vitro fertilization (IVF), birth control, menstrual products, and disease diagnostics, have dramatically transformed the lives of billions. These seemingly ubiquitous health technologies are so commonplace that it's easy to overlook that historically, women rarely had a say in the development of any of these innovations. While Patrick Steptoe and Robert Edwards's groundbreaking work on IVF revolutionized modern embryology and reproductive science and propelled a multi-billion-dollar industry, there was one crucial puzzle piece missing: female minds. As we enter the first quarter of the twenty-first century, female health innovations are sparking triumphant results because women – especially women of color – are taking on critical roles in the emerging industry known as FemTech.

Although diversity is crucial in all industries, it can be a matter of life and death when it comes to women's health. A recent study featured in the scientific journal Pediatrics showed that "Babies conceived via assisted reproduction technology (ART), and born to Black mothers are more than four times likely to die as newborns as their

white counterparts."<sup>1</sup> Strikingly, another study by Greenwood et al. found that "Black babies were far more likely to survive with a Black doctor" and that "the mortality rate significantly decreased at hospitals that deliver more Black newborns."<sup>2</sup> However, in the United States, Black or African Americans only make up 4.7% of doctors and an even smaller 3.3% of engineers.<sup>3</sup> While racial disparities in ART infant mortality is a difficult and complex topic, there is no doubt that higher rates of adverse outcomes amongst Black newborns reflect larger socioeconomic and systemic issues. Poor neighborhood conditions, lack of access to health care, psychosocial stress, racial discrimination, and systemic racism also contribute significantly to these disparities, demonstrating that lack of diversity and underrepresentation significantly impact health outcomes for Black women.

Fortunately, the growing prominence of diverse engineers has paved ways to address these issues. Companies like Meet Mae and Health in Her Hue, founded by teams of female engineers of color, combat the systemic inequalities faced by Black women during pregnancy and provide access to a network of culturally competent healthcare pro-

fessionals who understand the issues that disproportionately affect Black women. The digital platforms will transform the holistic nature of care and significantly reduce infant mortality among Black women.

Rising female engineers have created a paradigm shift in the twenty-first century. FemTech companies worldwide have received approximately \$15.9 billion in funding, demonstrating increased capital interest in female health engineering and opportunities for diverse engineers.<sup>4</sup> With engineers like Heather Bowerman, founder of DotLab, who created DotEndo, a noninvasive blood test to detect endometriosis biomarkers, as well as Gameto, a biotech company developing fertility, ovarian disease, and menopause therapies through cellular engineering, we are on the precipice of innovation. Companies like Gabbi have developed methods to effectively use AI to predict a woman's risk of breast cancer and provide personalized action plans.

The combined effort of these brilliant and diverse engineers will forever change the lives of women across the globe. Despite the challenges ahead, the future of FemTech is bright. Through the power of diverse engineer-

# ATTER FUTURE: THE EVOLUTION

Lee '25

ing, women of all backgrounds will eventually not only receive the care they deserve, but will be at the forefront of shaping it.



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## Sources

1. Lisonkova, S., Ukah, U. V., John, S., Yearwood, L., Muraca, G. M., Razaz, N., Sabr, Y., Yong, P. J., & Bedaiwy, M. A. Racial and Ethnic Disparities in the Perinatal Health of Infants Conceived by ART. *Pediatrics*, 150(5). (2022).
2. Greenwood, B. N., Hardeman, R. R., Huang, L., & Sojourner, A. Physician–patient racial concordance and disparities in birthing mortality for newborns. *Proceedings of the National Academy of Sciences of the United States of America*, 117(35). (2020).
3. Engineer Demographics and Statistics in the US. <https://www.zippia.com/engineer-jobs/demographics/>
4. Funding generated for femtech companies worldwide in 2022, by subsector (C. Stewart, Comp.). (2022, August 15). Statista. (2019).
5. Palazzolo, S., & Stokes, S. 34 of the most promising women's health startups of 2022, according to VCs. *Business Insider*. Retrieved January 20, 2023, from <https://www.businessinsider.com/35-most-promising-femtech-startups-investors-women-health-2022-10>. (2022, October 17)

