SCHOLARLY REVIEW

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From the editors:

Welcome to the first issue of this new scholarly, multi-disciplinary journal for student authors. This not only provides young, emerging scholars with a new platform to showcase their work, but also provides readers with insights into a diverse and eclectic range of topics. Whether readers select papers to read out of general interest or out of a desire to learn something new, they should not be disappointed. This issue covers subjects ranging from vocal pathologies to COVID vaccination policy, teachers' mental health and the Chinese Civil War, to name but a few.

Karly Chan's paper explains the anatomy of the respiratory tract, highlighting common vocal pathologies and promoting good vocal health practice for singers (and perhaps lecturers too). Diagrams help readers visualize and understand the anatomy of the respiratory tract. Karly then discusses different factors that lead to vocal pathologies, while suggesting preventive and predictive measures for promoting good vocal health. Rishi Kumar's paper analyzes the impact of impervious surfaces on flooding in Mumbai, India. Rishi highlights the potential usage of satellite technology to predict and prevent natural disasters, such as floods, developing a hypothesis on where and how impervious surfaces can lead to high flood intensity.

Rachel Zhang's paper investigates how Syrian refugees influence the economy and labor markets in Turkey, linking historical and political factors behind the current crisis. Rachel highlights the need for action by the Turkish government as a vital alternative to blaming refugees for the country's economic woes. Emily Wang's paper directs the focus of mental health in schools away from students and on to teachers, proposing the introduction of mental health days for teachers. Information gathered from a questionnaire survey provides evidence and reasons for why teachers' mental health days may be needed, and Emily makes practical recommendations that could help facilitate policy implementation. Lucy Yu's paper provides a timely literature review on covid-19 vaccine through a qualitative thematic analysis of recent literature. Lucy covers the management of vaccine development, the comparison of available vaccines and vaccine distribution, emphasizing the importance of global collaboration in the ongoing fight to control the pandemic.

Haley Son's paper focuses the Chinese Civil War (1946-9), connecting both military power and social support in the community. Hayley discusses possible reasons behind the victory of the Chinese Communist Party, elaborating on weaknesses of the Guomindang, strengths of the Chinese Communist Party, and the interactions between them. Finally, Daniel Zhang's paper focuses on ideological developments associated with the French Revolution and how political narratives may have influenced Beethoven's work. Daniel makes detailed connections between the political situation in Europe at the turn of the nineteenth century and six out of the nine Beethoven symphonies.

Scholarly Review

The Workings of the Human Voice:
Common Pathologies and Holistic Approaches to Vocal Health

Karly Chan

Author Bio:

Karly Chan is currently a junior at Great Neck South High School. She is particularly interested in voice science (i.e. vocal anatomy, physiology, and pathologies). Karly has been part of her school's research program since freshman year, and has previously interned in a chemical virology lab at Cornell University. Karly is also the founder and president of VOCO - Vocology for Singers, a non-profit organization that educates singers on vocal health and the science behind singing. Additionally, she is the founder and president of STEM for FEM's NY Chapter, a branch of a nonprofit organization that aims to provide free science education to girls and other underrepresented gender identities in elementary and middle school.

ABSTRACT

The human voice is produced by an intricate web of structures. Through understanding vocal anatomy and physiology and exploring singer and clinician perspectives, this paper will review common vocal pathologies, evaluate problems that can prevent a singer from being able to perform, and consider possible treatment options. This review will consider different factors that impact vocal fitness and the production of the human voice, including breathing, posture, and emotional well-being. Pathologies that will be covered include those of the voice resonators, larynx, vocal cords, and respiratory tract. By considering multiple perspectives and vocal care habits, it could help readers understand how different sounds are produced and what common problems can affect the workings of the human voice. This paper also aims to provide a holistic approach to vocal health, as opposed to a strictly mechanical method, taking into account various resources, while still analyzing current research on treatments for these pathologies.

Keywords: Vocal Pathologies, Human Voice, Singers Diseases, Vocal Health

Introduction

Everyone uses their voice. The voice is the basis of identity and communication for humans. Through our voices, we convey emotions, ideas, and messages. Our voices also separate us from others and are a means of recognition for other people. However, most people do not understand the anatomy and physiology of their vocal structures and neglect learning the science behind voice production. In a survey done in 2012, it was found that approximately 17.9 million American adults have had a vocal problem in the past year (Bhattacharyya, 2014). In the same survey, it was found that around 12.5% of children between the ages of 11 and 17 and 6.3% of children between the ages of 3 and 10 had vocal problems (Black et al., 2015). Certain people, like telemarketers and singers, are more prone to voice disorders (Jones et al., 2002), (Pestana et al., 2017). Overviewing the pathologies of the voice increases awareness of the consequences of improper vocal use. Evaluating different treatment methods for various pathologies of the vocal structures elucidates current research and shines a light on clinical procedures.

An overview on factors impacting someone's vocal health allows people to understand how they can improve their own vocal fitness and protect their voices. In order to understand all of this, an initial overview of the anatomy and physiology of vocal structures was included to gain a deeper understanding of the tissues, muscles, ligaments, and cartilages involved in voice production. This review also covers proper vocal care habits supported by current research. Although most reviews focus on a mechanical approach to vocal pathologies and health, I analyzed various factors involved and used multiple perspectives: clinicians' experience, singers' experience, and research studies on vocal anatomy and physiology and vocal pathologies. Using medical and scientific journals, medical websites, primary studies on the science of singing and different diseases, comparative studies of treatments, blogs of ENT experiences, and articles on professional singers' accounts on their experiences with various vocal disorders, I assessed different vocal pathologies, treatments, effects, and factors that affect vocal fitness.

Anatomy and Physiology

A proper understanding of the larynx and the cartilages and muscles that are part of it is critical for surgeons, otolaryngologists, and other clinicians because they work in an intricate web to create different qualities and pitches of sounds. They are also sites of numerous pathologies, and are delicate locations that surgeons must be careful around when performing vocal surgery.

The respiratory tract includes the organs and structures that are involved with airflow during inhalation and expiration. The upper airway consists of the pharynx, which is the membrane-lined region that spans from the back of the mouth to the beginning of the esophagus (Mankowski & Bordoni, 2020). This region is extremely important in voice production and serves as the resonators for sound. Changing the shape of the pharynx has great effects on the quality of the voice. Scarring of the tissues in the pharynx or tension of the muscles in this area can cause considerable

changes to the voice that are often recognizable by voice professionals (Mankowski & Bordoni, 2020). The lower airway consists of the trachea, bronchi, bronchioles, alveoli, and lungs (Ball et al., 2020). The trachea is the windpipe that allows for airflow from the larynx to the bronchial tubes. The lungs are the central organ of the respiratory system, and through differences in air pressure, they allow us to inhale and exhale and exchange gases. These organs and structures are extremely important for voice production as they provide a stream of air that then causes the vocal folds to vibrate and create sound. Professional singers train to utilize more air in their lungs, thus increasing respiratory efficiency so that they can sing longer without having to inhale frequently (Ball et al., 2020). The diaphragm is a dome-shaped muscle that allows for proper respiration (Bains et al., 2020). When the diaphragm contracts, it expands the lungs and pushes down on the abdomen, allowing for inhalation. When the diaphragm relaxes, it reduces the

size of the lungs, allowing for exhalation. Along with other abdominal muscles, the diaphragm is able to greatly affect the passage of air (Bains et al., 2020).

The larynx, also called the voice box, functions in protection of the respiratory tract during respiration and swallowing, and the production of sound. The vocal cords, housed in the larynx, produce sound by vibrating when air is passed in between them (Saran et al., 2020). The major muscles involved in voice production are the cricothyroid muscle, thyroarytenoid muscle, and vocalis muscle (as shown in Figure 1). The cricothyroid muscle stretches, thins, and lowers the vocal cords; when it contracts, it increases tension in the vocal cords longitudinally and raises the pitch. The thyroarytenoid muscle adducts the vocal cords, shortening, lowering and thickening them. When air is also passed through the glottis, this shortening and thickening of the vocal cords causes the pitch of the voice to lower (Sataloff et al., 2020). Finally, the vocalis muscle is the muscle that makes up the bulk of the vocal cords and assists in adjusting vocal pitch by contracting or relaxing (Sendic, 2020). The extrinsic muscles (muscles on the outside of the larynx) play a significant role in positioning the larynx so that the intrinsic muscles (muscles in the inside) can effectively work together to produce the human voice (Sataloff et al., 2020). The vocal cords are the mucous membranes that actually participate in sound production. The gradual change from the flexible outer layers to the stiffer inner layers of the vocal cords is thought to help lessen damage to the vocal cords while

it vibrates. The true vocal cords oscillate when air passes through the glottis (the space between the vocal cords), producing the human voice. Above the vocal cords are the false vocal cords that produce resistance in the vocal cords and are speculated to assist in the resonance of the sound as well (Saran et al., 2020).
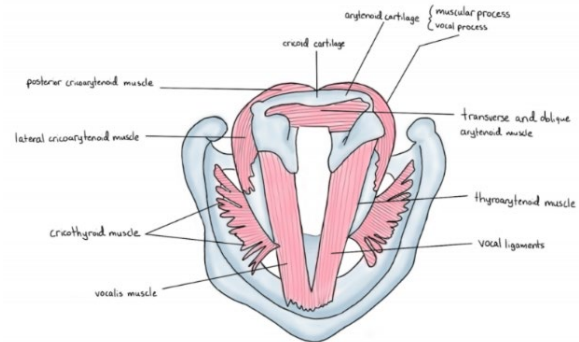

Figure 1. Diagram of the vocal cords and the associated muscles, ligaments, and cartilages (KC, 2021).
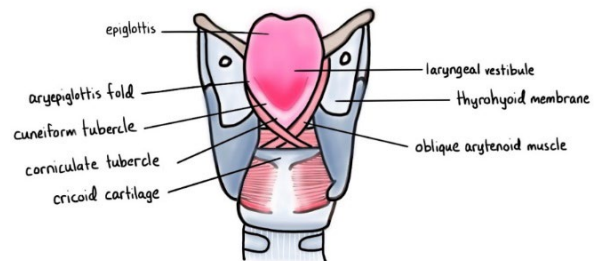

Figure 2. Diagram of the posterior view of the larynx (KC, 2021).

Vocal Pathologies

In this section, the common pathologies of the vocal structures: sinuses, pharynx, respiratory tract, larynx, and vocal cords will be covered. Treatments and effects of some of the more serious pathologies on patients was analyzed through consideration of the perspective of clinicians, researchers, and some famous singers who have publicly addressed their experience with certain pathologies.

Pathologies of the Voice Resonators

Nasopharyngeal Carcinoma, which are tumors located in the pharynx, are commonly linked

to the Epstein-Barr virus or dietary intake (Frazier & Drzymkowski, 2020). Although patients are commonly asymptomatic during the early stages, symptoms include tinnitus (ringing of the ear), impaired function of cranial nerves, headaches, and pain. Due to the anatomical location of the nasopharynx, it is difficult to do surgery on the area. Instead, treatments usually include radiation therapy or chemoradiotherapy for more severe cases. In a randomized controlled trial published in 2010, radiotherapy and supplemental chemotherapy significantly decreased the number of cancer-specific deaths and improved the failure-free

rate (Lee et al., 2010). However, in a study done in 2007 evaluating the quality of life of patients after chemoradiotherapy on the nasopharyngeal carcinoma, it was found that the quality of life of patients post-treatment was extremely poor, a result consistent with previous studies (Oates et al., 2007). Overall, although nasopharyngeal carcinoma is primarily treated through radiation therapy and/or chemoradiotherapy, these treatments lead to unpleasant side-effects that often interfere with the patient's well-being.

Pharyngeal pouch (Zenker's diverticulum) is a protrusion of the throat. It typically causes dysphagia (difficulty in swallowing), aspiration (sucking foreign objects into the windpipe), and a chronic cough. Some treatments include surgery through the neck. However, a vast number of these surgeries are extremely high-risk because of their inherent nature and the increased risk of getting cancer in the pharynx post-surgery (Siddiq et al., 2001). In a study published in 2002, endoscopic stapling resulted in similar outcomes to traditional methods but was found to be safer (Safdar et al., 2002). In a comparative study done in 2011, it was found that transoral stapled diverticulo-esophagostomy and the flexible endoscopic approach are effective and minimally-invasive treatment options (Repici et al., 2011). Overall, surgeries done using endoscopes have been found to be effective consistently in studies.

Pathologies of the Larynx

Laryngitis is the inflammation of the vocal cords and larynx (Frazier & Drzymkowski, 2020). Due to the narrow structure of the larynx, symptoms could include trouble breathing. Other symptoms are hoarseness, aphonia (inability to speak), fever, and dysphagia. Treatments of viral laryngitis include complete vocal rest and bed rest in a humidified room, along with an abundance of fluid intake. If bacterial infections are related, antibiotics are used as well. In more severe cases, corticosteroids may be taken to lessen inflammation. In singers, laryngitis can have accentuated negative consequences. Singers may face a heightened amount of stress because of their loss of voice and subsequent loss of income (Jahn, 2002). However, doctors, researchers, and singers usually agree that the best treatment is absolute vocal rest, and although it may be troublesome, as long as further damage is not caused, singers can usually get back to work within 1-2 weeks.

Tumors on the larynx may be malignant or benign (Frazier & Drzymkowski, 2020). Dysphonia (difficulty in speaking) is usually the symptom for tumors on the larynx. Hoarseness or stridor (a high-pitched sound while breathing) may also be present because of the obstruction of the airway. Benign tumors are often treated with management of vocal strain or acid-reflux. Malignant tumors are usually treated with radiation therapy, or in metastasized cases, laryngectomy. However, with laryngectomy, people will lose their voices. For singers, this is obviously a last resort and patients often have to deal with significant psychological trauma. Patients often lose confidence, retreat in social isolation, and develop mental health problems (Moors, 2016). For doctors, total laryngectomy is often avoided for this reason but if there is no other choice, this may be the only option. There has been research done in this field with promising results. In a study published in 2002, use of a DSP device for esophageal speech improved overall speech quality for total laryngectomy patients (Matsui et al., 2002). In a study published in 2013, utilizing a supraglottal voice source was found to improve the quality and acoustics of speech with an electrolarynx (Wu et al., 2013).

Laryngeal Cancer is a neoplasm (tumor) of the larynx - typically squamous cell carcinomas. The treatments for laryngeal cancer include radiation, partial or total laryngectomy, or laser excision. Typically, singers and other patients prefer radiation because it is the option that does not involve the loss of the voice. However, treatments of later stages of cancer often include surgery followed by radiation, which can obviously have negative effects on the quality of life of the patients as described before (Frazier & Drzymkowski, 2020).

Pathologies of the Vocal Cords

Arytenoid granuloma is a benign growth along the posterior region of both or one of the vocal cords (Frazier & Drzymkowski, 2020). It can become painful to swallow or speak and can even inhibit the vocal cords "from closing properly during voice production." It is often useless to remove the growth through surgery, and so botox is usually injected to reduce trauma between the vocal cords and treat granulomas. This is a good option for singers because they do not have to lose their voice, and it is a procedure used by many doctors and found to be effective in research

studies. In a study published in 2016, granulomas were cured in 77% of patients with botox treatments (Yilmaz et al., 2016).

Vocal Cord Cancer is the cancer of the vocal cords, the glottis region of the larynx (Cleveland Clinic medical professional, 2019). Small lesions resulting from this cancer often prompts patients to seek medical help, which typically results in early detection of this cancer. Treatments are often chosen through the consideration of different factors: the effect on the voice and the amount of side effects. A new procedure, KTP laser, has been found to be very effective as well, allowing only the diseased region to be treated, thus minimizing negative effects on the voice (North Shore Voice Center, n.d.). In a comparative study published in 2014, KTP laser treatments in patients was found to be effective and preserved the larynx for between 89 to 99% of the patients (Zeitels & Burns, 2014). However, using KTP laser to treat vocal cord cancer is still a relatively new procedure that needs further research in the field.

Vocal Cord Dysplasia is the pre-cancer of the vocal cords, or the stage right before it is considered vocal cord cancer. Vocal Cord Dysplasia commonly causes leukoplakia (white lesions) or erythroplakia (red lesions) on both or one of the vocal cords and results in hoarseness. Treatments include "vocal cord stripping," KTP laser, or simply monitored waiting. Aggressive surgery such as vocal cord stripping is detrimental to singers, so it should be used as a last-resort option. Research has found that just monitoring the vocal cords without treatment results in an approximately 20% chance of it turning into cancer (North Shore Voice Center, n.d.), so resorting to one of the treatments mentioned is necessary.

Vocal Cord Nodules is the development of firm scar tissue on opposite regions of each of the vocal cords. These nodules are typically treated using voice therapy with a speech-language pathologist, but if this is not effective, a minimally invasive laryngeal surgery may be needed (North Shore Voice Center, n.d.). One famous singer who had vocal cord nodules was Freddie Mercury. However, he refused surgery and subsequently, his voice suffered over the years (Wurzburger, 2019). Many singers are often afraid to do surgery on their nodules for fear of their voice being lost, but if surgery is not performed, their voices could get even worst.

Vocal Cord Polyps are protruding gelatinous structures on a vocal cord. It is often a consequence of constant collision or trauma of the vocal cords such as in constant yelling. Treatment usually involves a minimally invasive laryngeal surgery (North Shore Voice Center, n.d.). One famous singer who has publicly addressed her experience with surgery after getting a vocal cord polyp is Bjork, an Icelandic singer. She has had a positive experience with surgery and states that her singing "definitely feel like my cords are as good as pre-nodule" (Wurzburger, 2019).

Vocal Cord Cysts are spherical-shaped structures that can be fluid-filled or solid and are typically found deeper in the vocal cords than polyps or nodules. Treatment, again, usually involves a minimally invasive laryngeal surgery (North Shore Voice Center, n.d.). One famous singer who has had surgery after getting vocal cord cysts is Christina Perri. After being operated on, her "voice quality improved" and she has been able to fully recover (Buia & Morrill, 2015). Overall, having surgery on vocal cord nodules, polyps, and cysts seems to be effective when done by a certified clinician and seems to be the best option.

Pathologies of the Respiratory Tract

Recurrent Respiratory Papillomatosis (RRP) is caused by HPV and results in wart-like growths on the vocal cords, larynx, throat, or esophagus (Frazier & Drzymkowski, 2020). These growths prevent the cords from vibrating and closing properly, which leads to a raspy voice. No treatment has been determined to be adequately effective for this disease (Ivancic et al., 2018), Human leukocyte interferon was one of the first therapies used but is no longer used because other treatments using cidofovir and bevacizumab have been found to be more effective (Ivancic et al., 2018). However, multiple studies have found cidofovir to cause different side effects ranging from vocal cord scarring to inflammation (Broekema & Dikkers, 2008). Because RRP is a rare disease, it is not well understood and more research is needed to find effective treatments.

Polypoid corditis (Reinke's edema) is usually a consequence of heavy smoking and acid reflux and causes heavy and large polyps to develop on the vocal cords, which then in turn result in the vocal cords vibrating more slowly during voice production, causing a lower pitched voice (North Shore Voice

Center, n.d.). In severe cases, the laryngeal airway can be restricted, causing dyspnea (difficulty breathing). Surgical excision is the accepted treatment used to treat polypoid corditis for clinicians. In a comparative study done in 1987, it was found that the Hirano technique of surgical excision was the most effective treatment when done with vocal hygiene management as opposed to vocal cord stripping and CO2 laser obliteration (Lumpkin et al., 1987).

Overall, for all of these pathologies, alternate treatments addressing other potential causes of these conditions may be needed. Treatments for acid-reflux, sinusitis, or stress are some examples.

Discussion

Many different elements combine to enable a singer to perform well, affect the quality of the human voice, and contribute to potential vocal pathologies. The health of the respiratory system, posture of the singer, tension of the vocal cords, sleep apnea, congestion, psychological well-being, and the environment are all factors that can affect a singer's vocal fitness.

First, the respiratory system has to be strong and breath has to be controlled well. Professional classical singers often consciously contract the abdominal muscles and expand the rib cage, allowing more air to flow in. It is observed that professional singers usually contract the abdominal muscles to increase the "pressure-generating" ability of rib cage muscles to be able to use more air from the lungs and reap better sound quality; a constant stream of air is provided for the vocal cords by carefully using up air. Concentrating on good breath support is considered an extremely important training to lessen the strain on the vocal cords (Salomoni et al., 2016).

Second, proper posture is another very important aspect of maintaining good vocal fitness. Most professional singers agree that good posture leads to a better singing quality. In a study published in 2007, researchers found that tilting the head upwards could permit greater airflow and cause the sound produced to be louder, while tilting the head downwards could decrease airflow (Luck & Toiviainen, 2007). Proper posture is necessary so that

the vocal tract is not obstructed and so that airflow and resonance space is optimized.

In addition, the timbre and pitch of the voice depend on the tensions of the vocal cords. The intrinsic muscles of the larynx stretch or relax the vocal cords and heighten or lower them as described in the previous section. This is what causes different "tones" of the voice and different pitches. Tightening the extrinsic muscles of the larynx often may strain the voice (Trall, 1875). There needs to be more research in determining if the raising of the larynx plays a role in the changing of pitch and if it causes harmful effects to the voice.

Furthermore, sleeping with the mouth open has harmful effects on the voice as it can negatively affect the vocal structures. In a controlled study published in 2012, hoarseness of the voice was found to be more common in snorers (Hamdan et al., 2012). Congestion of the mucous membrane of the pharynx, nose, and other vocal structures can all cause hoarseness of the voice and other harmful vocal effects (Trall, 1875).

The environment singers live in or are frequently surrounded in can also vastly affect their vocal health. In a study done in 2017, it was found that people who had vocal nodules significantly worked more in environments with high noise levels than control groups. They thus had to use their voices more and talk more loudly, causing vocal damage (Portela et al., 2017). If singers are in an environmentally polluted area, this may also negatively affect their voice. Being in a polluted area could negatively affect the respiratory tract, which can negatively affect the voice because, as described in previous sections, these structures all combine to produce the human voice.

Not only does the environment have an impact on vocal health, but psychological factors also impact vocal fitness. Music performance anxiety can affect a singer's voice. When singing while feeling stressed, a singer may feel increased consequences. For singers, their voice is their actual instrument, and so music performance anxiety can directly impact their ability to sing. Good vocal techniques can be forgotten due to the stress, which can lead to vocal damage. However, in a study published in 2003, it was found that anxiety in high-level singers actually improved their performance (Kokotsaki & Davidson, 2003).

Thus, how music performance anxiety affects a singer may be subject to change depending on the level of the singer (i.e. whether they are professionals or students).

In order to avoid vocal pathologies and to have good vocal health, one needs to be aware of the holistic nature of the human voice. Having good breath support and proper posture, preventing muscle strain in the throat, and avoiding screaming or being in polluted or loud areas can all contribute to good vocal health. Additionally, drinking a minimum of 64 fl. oz. of water per day and being in well-humidified areas are good vocal care practices that have been found to improve efficiency of the vocal structures (Sivasankar & Ciara, 2010). These are all practices that have also been commonly preached by clinicians and voice professionals.

Conclusion

The voice is an integral part of everybody's life, especially for singers. However, the vocal structures are tiny structures that may be resilient, but are still prone to many pathologies, especially if subject to frequent trauma. Not only is it important for people to understand the anatomy and physiology of healthy vocal structures, but it is also important to explore common vocal pathologies. Some pathologies, like nasopharyngeal carcinoma, laryngeal cancer, and other cancers of vocal structures, have not had effective treatments. Future research and clinical studies can test different treatment options and their effectiveness as compared to existing options. Additionally, as in this review, a holistic approach to voice production and vocal pathologies is important. Instead of focusing on a specific vocal structure, muscle, pathology, or treatment protocol, things like the health of the diaphragm, environment, and psychological well-being, should also be considered.

Acknowledgements

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Using Geospatial Technology to Investigate The Effects of Impervious Surfaces on Flooding in Mumbai

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ABSTRACT

Flooding is one of the most common and impactful natural disasters in the world. Some areas are devastated by floods on a yearly basis. One such area is the city of Mumbai, an extremely developed and populated coastal city in India. Mumbai faces several floods each year during its monsoon season from June to September. These floods are devastating to Mumbai which is India's financial capital. There are several theories as to why Mumbai floods so much and one theory is due to its high impervious, or artificial, surface percentage. Using geospatial technology such as satellite imagery from NASA worldview and Global Flood Monitoring System, this study focused on understanding the causes and effects of flooding in Mumbai and determining whether impervious surfaces cause more flooding in Mumbai. The flood event that was analyzed, the floods of July 2nd 2019, was also mapped. This study suggested that Mumbai's high impervious surface percentage and urbanization led to greater flooding which caused mortality and several economic damages. This research shows the potential for analyzing natural disasters with satellite technology and how to possibly prevent future damage from floods.

Keywords: Impervious, Flood Intensity, Precipitation, Rainfall, Floods, Urban, Mortality, Economic Loss

Introduction

Floods are some of the most impactful natural disasters in the world. Flooding happens when there is an overflow of water onto land that is normally dry and drains efficiently when wet. It is often caused by excessive rainfall. Any area that experiences excessive rainfall is vulnerable to flooding. Floods are the most common weather-related disasters and can be particularly dangerous (NOAA National Severe Storms Laboratory, n.d.).

In terms of mortality and property damages, floods are only behind tornadoes. Floods around the world cause over 40 billion dollars in damage annually. In addition, they kill more than a 100 people each year (Nunez, 2021).

Flash floods are a particular type of flood event where flooding occurs very quickly because the ground cannot absorb the heavy rainfall. Flash floods are typically more common in densely populated urban areas (NOAA National Severe Storms Laboratory, n.d.). This is because urban areas have a lot of impervious (not allowing fluid to pass through) surfaces that are unable to absorb flood water (Assessing the Impact of Impervious Surfaces on Water. Resources in Southern California, n.d.). Coastal urban areas are especially at risk because they are built and extensively developed in naturally flood prone areas. This is due to a growing population and people's desire to live near beaches and a coast (Riebeek, 2005).

Figure 1. An Example of a Coastal City

A major coastal city that faces floods is Mumbai. Mumbai is India's financial capital located in the state of Maharashtra. As of 2020, Mumbai has a population of 20,411,000 and is one of the most densely populated cities in the world (Kolb, 2019). Mumbai faces a harsh monsoon season from June to September that results in a lot of flooding (Ramudai, 2017). These floods bring the city to a pause multiple times each monsoon season. To contain flooding, Mumbai has built and is working on building more dewatering pumps (Ms, 2020). However, it is unknown whether these pumps will be enough to make up for the weak drainage systems, lack of natural flood absorbers, and extreme monsoon conditions (Srivastava, 2019).

The flood event that was studied in this paper occurred in Mumbai on July 1st 2019. This event was chosen because it was the heaviest rainfall in Mumbai in the last 14 years and a particularly devastating flood (Masih, 2019). This flood event spanned many days and begun on June 28th and reached its peak on July 1st

Figure 2. July 1st 2019 Flood in Mumbai

This study sought to map and analyze this flood event and the effect of its extent and duration on the disruption of the city's normal operation. This study also sought to determine whether impervious surfaces caused greater flooding in Mumbai on July 1st 2019. Some other causes of flooding, such as Mumbai's relative low elevation, were also investigated. These goals were accomplished through a variety of tools and figures.

Materials and methods

First, the main cause of the flooding needed to be determined and analyzed. Since this flood event was caused by torrential monsoon rain, the rainfall needed to be graphed. A time series as well as satellite images showing rainfall progression over a period of time were acquired. Using this information and the same dates, a time series for flood intensity was produced. Since there were multiple periods of rainfall, there was flood intensity variation over the observed time period. This resulted in three major flood peaks for which inundation maps for flood intensity were produced.

Visualizations/Satellite imagery:
NASA Worldview
(https://worldview.earthdata.nasa.gov)
is a tool from NASA's Earth Observing System Data and Information System (EOSDIS). It provides the capability to interactively browse over 900 global, full-resolution satellite imagery layers and then download the underlying data (*Worldview | Earthdata*, n.d.). Worldview was used to search for and visualize satellite images of flood related layers/maps in the Mumbai Area. These images were saved as a KMZ file (a file format meant for storing geographic data) and exported to Google Earth for further visual enhancement. Google Earth allows the overlaying of multiple layers and included roads and other landmarks in the final visualizations. The spatial resolutions for all the layers were checked and converted to meters. This was done for the purpose of scale compatibility and to ensure all the figures could be compared accordingly.

Selection of Layers/Maps:
Worldview provides several layers that can be used for flood analysis. The layers used in this paper were carefully selected based on what has been used in literature as well as their applicability to the Mumbai area. Furthermore, each layer selected had to fit and add to the three sections in this paper: causes, analyzing the flood event, and results of the flood event.

Overall Rainfall and Flood Detection Time Series:
Global Flood Monitoring System (http://flood.umd.edu) is a modeling system that uses real time satellite-based precipitation data to model and calculate information about floods, precipitation, and streamflow around the world (Wu et al., 2014, p. 2709). It was used to produce a time series plot for the three day rainfall accumulation

and flood detection/intensity for June 28th to July 4th. These dates were selected since they differed by three from the day of the most rainfall (July 1st) measured during the Mumbai flood event of 2019.

Flood Detection/Intensity maps:
Global Flood Monitoring System (GFMS) was used to produce maps showing the flood detection/intensity (depth above threshold) for Mumbai and the surrounding areas for the three flood peaks and a base map.

Hypothesis testing:
In order to understand whether impervious areas had a higher flood detection/intensity depth above threshold, three impervious and three natural areas around Mumbai were located using Google Earth. The coordinates were determined by using terrain in Google Earth and converted to decimal degrees. They needed to be converted since GFMS only accepts decimals degrees. These points were plotted in GFMS to produce time series for flood detection/intensity.

Results
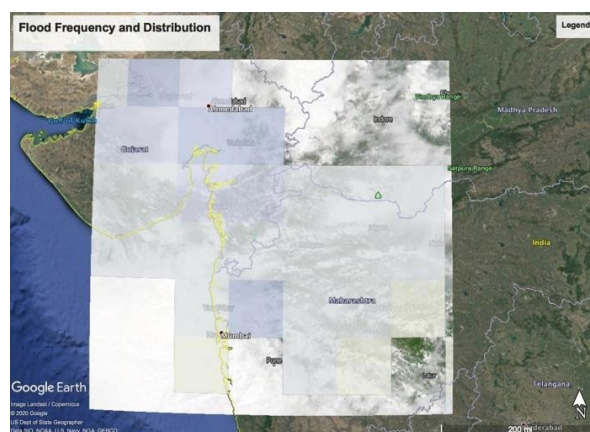
Causes of flooding in Mumbai

Figure 3. Flood Frequency and Hazard in Mumbai in 2000
Visualization of relative frequency and distribution in Mumbai and the surrounding area. Darker blue represents higher frequency and distribution and flood hazard. Mumbai has a value of 4 and 5. The scale is from 1-10 and it reveals the frequency of flooding as well as the relative distribution in a specific location.

Figure 4. Global Digital Elevation Map in Mumbai:
The surface elevation of Mumbai and the surrounding area is depicted. Flat areas are dark green.

The main cause of flooding in Mumbai is torrential monsoon rain (Chandrashekhar, 2019). This is why Mumbai has a relatively high flood frequency and distribution as shown in figure 2. However, other factors contribute to the severity and number of floods in Mumbai. As shown in Figure 4 Mumbai is extremely flat. Flat lands flood more since they allow more water to penetrate into the soil and stagnate on the surface when the soil reaches its water saturation capacity (Flooding - Water on the Land, n.d.). Another reasons Mumbai floods is due to lack of reservoirs around it. Reservoirs help in flood management by storing flood water (River Management - River Flooding and Management Issues - GCSE Geography Revision, n.d.). However, they only protect from floods flowing from higher to lower elevations, not coastal floods. Mumbai, being India's most populated city and financial capital, is very urbanized and has a large percentage of impervious surfaces and buildings.
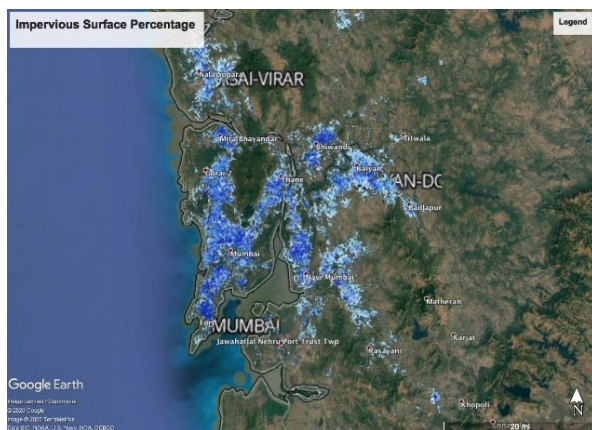

Figure 5. Impervious Surface Percentage of Mumbai in 2010
Visualization of impervious surface percentage in Mumbai in 2010. Darker blue areas represented higher percentages of impervious surface. Mumbai is at least 70% covered with impervious surfaces.

As shown in Figure 5, Mumbai is heavily covered with impervious surfaces. Impervious surfaces contribute to flooding because they do not absorb the flood water and cause runoff [3]. Mumbai also has several buildings and urban features. Urbanization contributes to flooding since it often takes the place of natural flood management services such as mangroves. In addition, it increases risk for economic damages of floods (Zhang et al., 2008, p. 2227).

Mapping and Analyzing the Flood event

The flood studied in this paper was the July 1st- 2nd flood in Mumbai in 2019. It was caused by extreme monsoon rainfall.
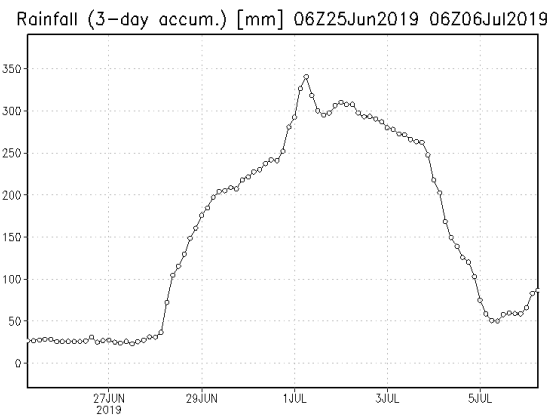

Figure 6. Three day rainfall accumulation in Mumbai from 25th June to 6th July 2019
Three day rainfall accumulation for Mumbai (19.06, 72.877) was plotted in 3 hour increments from 6am June 25th to 6am on July 6th 2019. The peak rainfall accumulation occurred at 6am on July 1st 2019.
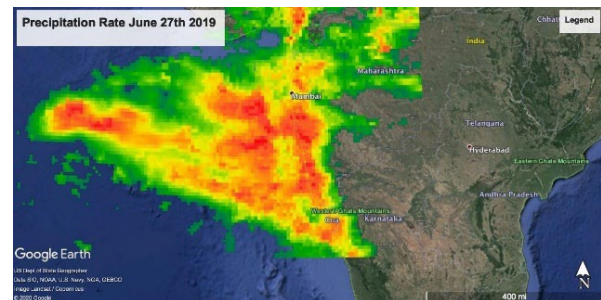

Figure 7. 1 day Precipitation rate in Mumbai and Surrounding area on June 27th 2019

Figure 8. 1 day Precipitation rate in Mumbai on July 1st 2019
1 day precipitation rate in Mumbai on July 1st 2019. Mumbai had a precipitation rate of about 12mm/hour.

The storm started in the ocean as shown in Figure 7 and slowly centered around Mumbai in Figure 8. This correlates with Figure 6 as the rainfall is very slowly increasing on June 27 but rapidly picks up on June 29th since this is presumably when the storm begins to focus on Mumbai. This rainfall led to flooding over several days.
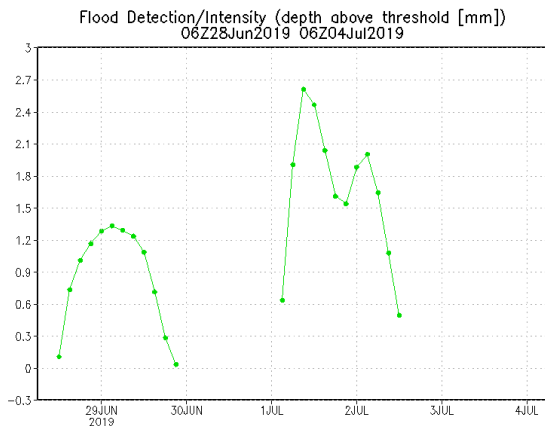

Figure 9. Flood detection/ time series in Mumbai from June 28th to July 4th 2019
The flood detection/intensity (depth above threshold) was plotted in 3 hour increments starting from 6am on June 28th 2019 to 6am on July 4th 2019 in Mumbai(19.06,72.877). There were 3 major flood peaks.

Inundation maps for the flood detection/ intensity (depth above threshold) of the 3 flood peaks were produced in order to observe and analyze the change in flood intensity in different areas in the city of Mumbai.
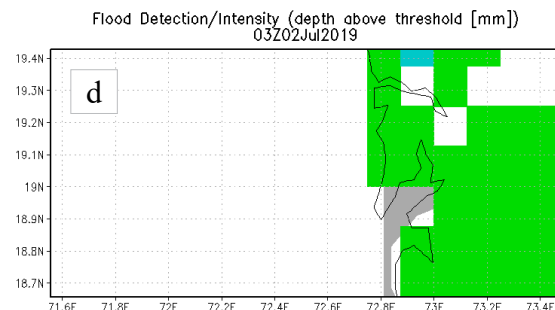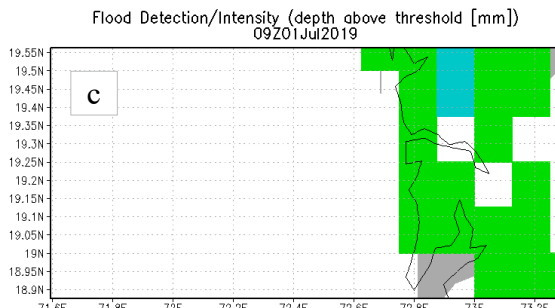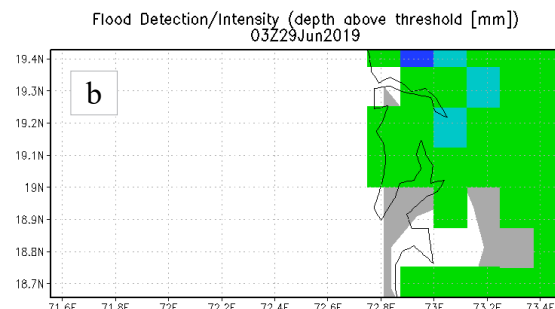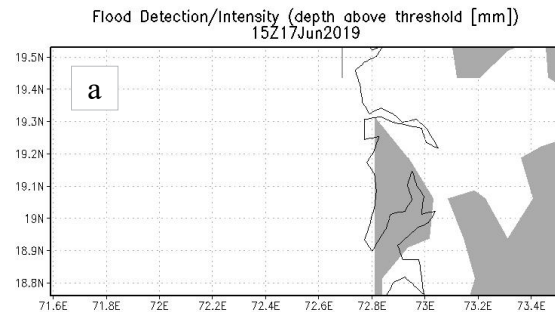

Figure 10. Flood detection/ time series in Mumbai from June 28th to July 4th 2019
The flood detection/intensity (depth above threshold) was plotted in 3 hour increments starting from 6am on June 28th 2019 to 6am on July 4th 2019 in Mumbai(19.06,72.877). There were 3 major flood peaks.

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Damages caused by the Flood

      This flood event had a significant impact on Mumbai in terms of mortality and economic loss. Damages caused by July 1st-2nd 2019 flood in Munbai included 32 deaths, trains and flights suspended, train tracks and roads damaged, and building and wall collapses.
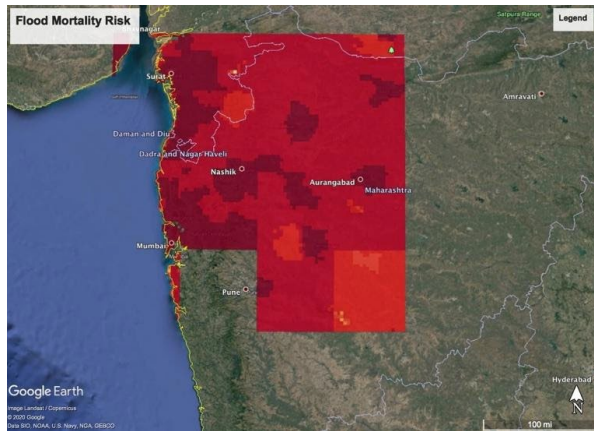

Figure 11. Mortality risk due to floods in Mumbai in 2000
Visualization of the loss due to morality because of flooding in Mumbai and the surrounding area. Darker red areas have a higher risk of mortality due to the flooding. Mumbai's mortality risk due to flooding is the highest on the scale, the 10th decile.
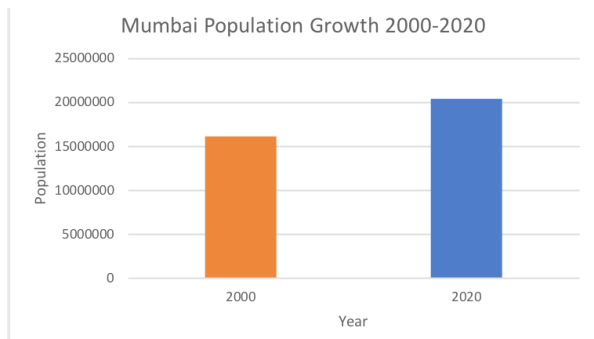
Figure 12. Mumbai population change from 2000 to 2020
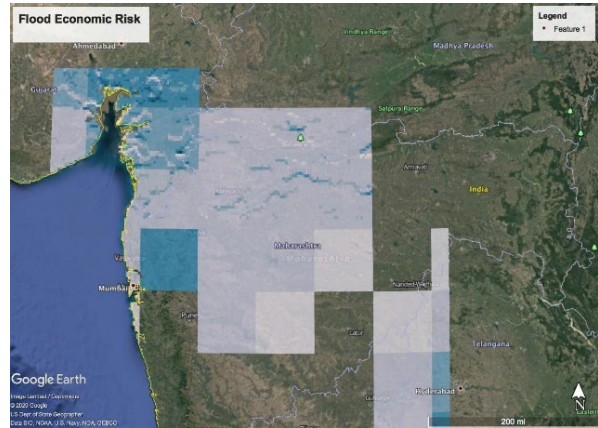
Figure 13. Risk of Economic Loss due to Floods in 2000
Visualization of the risk of economic loss because of a flooding in Mumbai and the surrounding area. The bluer areas represent areas more at risk of economic loss due to the flooding. Mumbai is in between the 5th and 7th decile.

      In order to understand whether Mumbai's high impervious surface percentage played a role in its increased flood intensity, three impervious and three natural areas in the Mumbai area were selected and are shown in Figure 14 below. These sites were selected by analyzing spaces in the Mumbai area using google earth and picking three urban (impervious) and three natural (green areas).
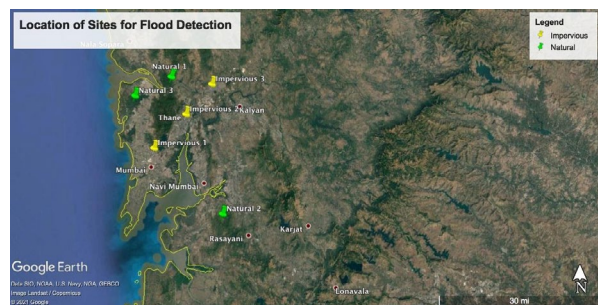
Figure 14. Location of points selected
Three impervious and three natural points located in and around the city of Mumbai. Green points are natural and yellow are impervious.

Time series for the flood detection/intensity from June 28th to July 4th 2019 were then produced for each of the points above. Natural in green and impervious in yellow.
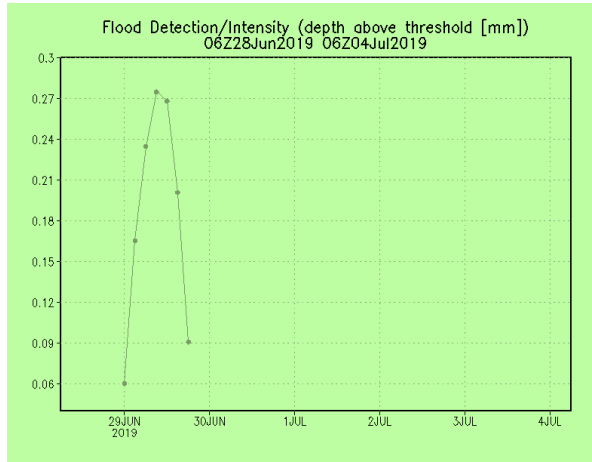
Figure 15. Flood Detection/Intensity at Natural 1 from June 28th to July 4th 2019
Flood detection/intensity (depth above threshold) time series for the point natural 1 in Figure 14 (19.30320278, 72.92777778)
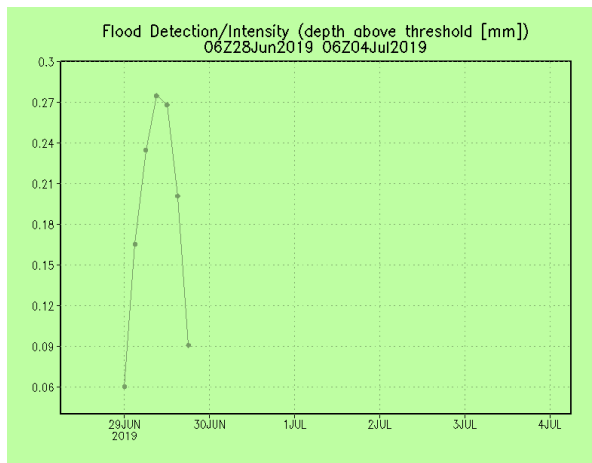
Figure 16. Flood Detection/Intensity at Natural 2 from June 28th to July 4th 2019
Flood detection/intensity (depth above threshold) time series for the point natural 2 in Figure 14 (18.9332, 73.0783)
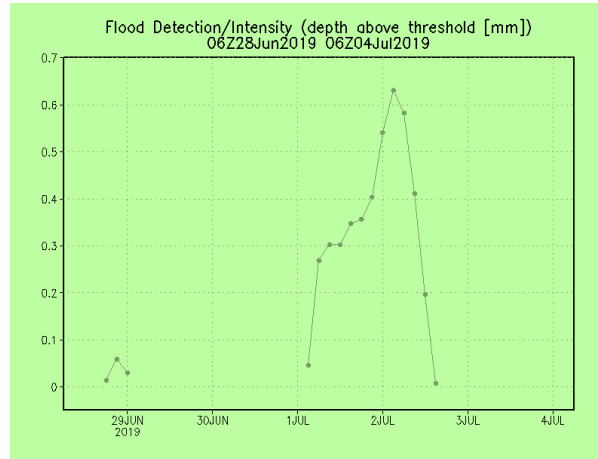
Figure 17. Flood Detection/Intensity at Natural 3 from June 28th to July 4th 2019
Flood detection/intensity (depth above threshold) time series for the point natural 3 in Figure 14 (19.2514, 72.82305)
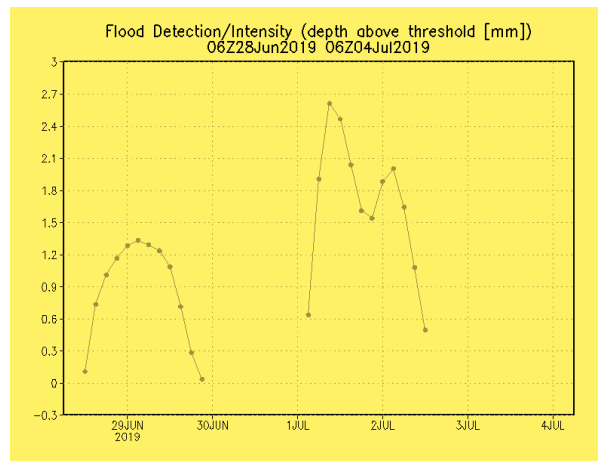
Figure 18. Flood Detection/Intensity at Impervious 1 from June 28th to July 4th 2019
Flood detection/intensity (depth above threshold) time series for the point impervious 1 in Figure 14

Figure 19. Flood Detection/Intensity at Impervious 2 from June 28th to July 4th 2019
Flood detection/intensity (depth above threshold) time series for the point impervious 2 in Figure 14 (19.20155278, 72.9708)

Figure 20. Flood Detection/Intensity at Impervious 3 from June 28th to July 4th 2019
Flood detection/intensity (depth above threshold) time series for the point impervious 3 in Figure 14 (19.2834, 73.044)
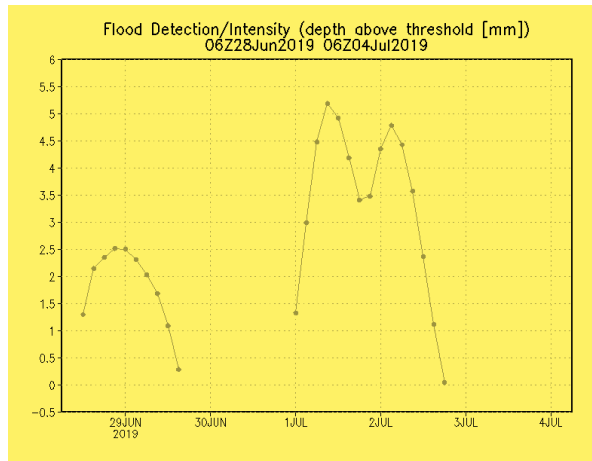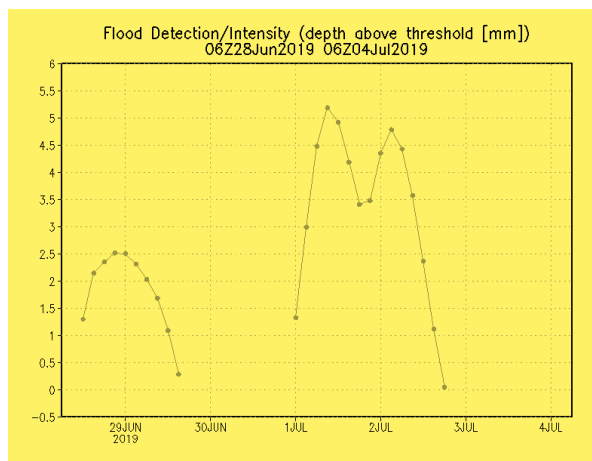
Discussion

Mumbai is significantly prone to the effects of flooding

Mumbai faces a very harsh monsoon season and often has multiple storms in a row as shown in this study. It is presumably not able to cope with many consecutive storms due to an old drainage system as well as depletion of natural flood absorption techniques such as preserving or planting mangroves

(Chandrashekhar, 2019). Furthermore, Mumbai's terrain makes it more susceptible to floods. Mumbai has mostly flat, coastal terrain. Since flat lands allow for more water to penetrate into the soil, by the time the second major rainfall event occurs, the soil water storage capacity is already at the maximum. This causes more flooding and is presumably the reason that the second and third flood peaks are greater than the first in the time series graphs shown in this paper. Even though Mumbai has reservoirs, they do not protect Mumbai from storms coming from the ocean. Finally, Mumbai is immensely covered with impervious surfaces which contribute to flooding (Assessing the Impact of Impervious Surfaces on Water Resources in Southern California, n.d.).

Mumbai is prone to damages of flood events

Mumbai is prone to damages from floods and suffered many damages from the July 1st-2nd 2019 floods. Since Mumbai has such a high population density, it is susceptible to death due to floods as shown by Figures 11 and 12. Mumbai also has many old buildings and slums. These are especially vulnerable to floods and often have wall collapses. Furthermore, since Mumbai is the financial capital of India, it faces a risk of economic loss through disruption of public life (Srivastava, 2019). This is supported by the fact that this flood caused flights and trains to be cancelled.

Analyzing the flooding and rainfall

The floods of July 1st, 2019 depict a classic monsoon storm in the city of Mumbai. A storm comes in from the ocean and causes mild rainfall for a few days resulting in a small amount of flooding which corresponded to the first flood peak in Figure 9. Since Mumbai has a weak drainage system as well as few natural flood absorbers, this initial rainfall often depletes flood water storage capacity. Then, when other storms center around Mumbai and cause extreme rainfall, the subsequent flood peaks are much more intense as shown in Figure 10.

Impervious surfaces caused a greater intensity of floods

Impervious surfaces had a greater flood detection/intensity (depth above threshold) than the natural surfaces as shown in Figures 15-20. The three

natural sites were all within 40 km of Mumbai's city center with Natural 1 and 2 being much closer. Natural 1 was a natural park, Natural 2 was a natural area containing mangroves, and Natural 3 was an area surrounded by forests and waterfalls. Natural 3 also had a higher elevation as compared to the other points. All 3 distinct natural sites had significantly lower flood detection/intensity values than all three impervious sites. The site Natural 1 only had one flood peak which was unusual and warrants further investigation. Natural 2 and 3 had very small first flood peaks as compared to the impervious sites. This is presumably because the surfaces absorb most of the water from the first major rainfall event but cannot absorb all from the second rainfall event. Impervious surfaces, on the other hand, can only absorb very little to none of both flood events. As a result, all their flood peaks are relatively large. Figures 15-20 do not exactly correspond to the impervious and natural areas depicted in Figure 5. This is because the pixel size of the flood detection/intensity map from the GFMS is very coarse (12x12 km2) compared to the city footprint and the size/shape of the natural land cover patches (Wu et al., 2014, p. 2694). In contrast, the impervious surface layer from NASA Worldview has a pixel size of 30 m. This is why the GFMS maps do not align with the impervious surface one. Furthermore, the city of Mumbai is an elongated shape with a width of about 11km. This is another reason why the GFMS, with a pixel size of 12 km, does not align perfectly with the map. In addition, a limitation to this study is the potential bias in selecting the natural and impervious sites since they were not randomly selected.

Selection of Layers and Limitations of Study

There were other layers that could have also been used in this paper. One such layer is the soil moisture (SMAP) layer. If included in this paper, this layer would be in the mapping and analyzing the flood event section. This layer was not selected because the rainfall and flood detection/intensity layers are deemed more effective. Some limitations of this study are the differing temporal and spatial resolutions used. NASA Worldview does not provide images for every year. As a result, this study had to utilize various temporal resolutions. In addition, differing spatial resolutions also had to be used at times causing a mismatch in scale between the different map layers.

Conclusion

This study hypothesized that Mumbai's large impervious surface percentage caused high flood detection/intensity. This study also investigated the causes of flooding in Mumbai using satellite imagery. Some of the causes included flat lands, impervious surfaces, and torrential monsoon rain. One reason why Mumbai faces harsh floods during the monsoon is due to multiple storms within a short time period. This was true for the flood event studied in this paper, the July 1st 2019 floods. The July 1st 2019 flood devastated the city through economic loss and mortality. The results support the hypothesis since three selected impervious sites all had 3-6 times higher flood intensity than the three selected natural sites.

This study adds onto previous research on the floods in Mumbai by studying a new flood event and going more in depth as to the cause of flooding in the Mumbai. There are a few options for future research for this study. One is to re design this study for another coastal urban city in India that is affected by monsoons and compare to the results for Mumbai. Another would be to design and research more flood management techniques and technology. To further strengthen the statistical significance of the findings in this study, more natural and impervious points will also need to be selected for comparison. Overall, this study demonstrates the vulnerability of Mumbai to the effects of flash floods due to a high impervious surface percentage.

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Appendix

Name of Layer	Time	Spatial Resolution(m)	Source
Impervious surface percentage	2010	30	https://sedac.ciesin.columbia.edu/data/set/ulandsat-gmis-v1
Flood Hazard: Economic Risk	2000	4600	https://sedac.ciesin.columbia.edu/data/set/ndh-flood-proportional-economic-loss-risk-deciles
Flood Hazard: Mortality Risk	2000	4600	https://sedac.ciesin.columbia.edu/data/set/ndh-flood-mortality-risks-distribution
Flood Hazard: Frequency and Distribution	2000	4600	https://sedac.ciesin.columbia.edu/data/set/ndh-flood-hazard-frequency-distribution
1 day Precipitation Rate IMERG	June 27th and July 1st 2019	2000	https://disc.gsfc.nasa.gov/datasets/GPM_3IMERGDF_06/summary
Global Digital Elevation Map(Terra/ASTER)	July 1st 2019	30	https://lpdaac.usgs.gov/products/astgtmv002/
Flood Detection/Intensity maps	29th June, 1st July, and 2nd July 2019	12,000	http://flood.umd.edu
Reservoirs	July 1st 2019	1,000	https://sedac.ciesin.columbia.edu/data/set/grand-v1-reservoirs-rev01

Table 1. Table of reference used for visualizations in paper

Refugees in Turkey:
Effects on Labour Market, Political Constraints, and Recommendation

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Rachel Zhang is a Grade 11 student at the Bishop Strachan School in Toronto. She has lived in China and Singapore prior to coming to Canada, and enjoys travelling to different places and experiencing new cultures. Although she has yet to decide her future career path, she's considering politics and economics. In high school, Rachel participated in Model UN conferences, which sparked her interest in politics. She is also a part of the badminton team and orchestra. When she isn't busy finishing school projects and reading up on current affairs, Rachel likes to read short stories and play the piano.

ABSTRACT

The Syrian Civil War has killed hundreds of thousands of people, and forced over 10 million Syrians out of their homes. Many of them have found refuge in Turkey, making it the largest refugee-hosting country in the world. However, the refugee crisis isn't the only problem that Turkey is currently facing. Turkey's economy has been declining since 2018 and with the added burden of the refugees, the situation for both Syrinas and Turkish citizens look dire. With no quick strategy out, the governments and citizens have turned on the Syrians, blaming them for the bad economic situation and their loss of jobs. This paper will analyze past and current data to assess the impact of refugees on the Turkish labour market. There is a positive correlation between the arrival of the Syrian refugees and Turkey's economic and labour downturn; however, there are many contributing factors to the downturn and the correlation does not necessarily suggest causation. The paper will then suggest possible solutions to ameliorate Turkey's economic crisis without causing a humanitarian crisis for the refugees, focusing on integration rather than deportation.

Keywords: Syrian Refugee, Syrian Civil War, Refugee Crisis, Refuge Policy, Turkish Economy, Informal Economic Sector

Introduction

A refugee crisis is an issue that poses many political and economic issues for many nations. Currently, the challenge is greater than ever with 80 million people forcibly displaced by conflicts across the world.[1] The war in Syria alone has caused 6.6 million to flee the country and an additional 7.6 million internally displaced. Due to its close proximity to Syria, Turkey has become one of the first stops for refugees, making it the largest refugee-hosting country in the world. Turkey is home to around 3.6 million registered Syrian refugees along with close to 320,000 other persons of concern of other nationalities.[2] With so many vulnerable people who are all in need of food, shelter, healthcare, and most importantly, jobs, arriving suddenly, the Turkish government was unprepared. Even now, 10 years since the crisis started, there is still uncertainty with how to best deal with the refugee crisis.

In this paper, I analyze the effects of refugees on the Turkish labor market and the reasons why the government intervened. Due to an inability to get work permits, refugees have to work in the informal sector. The government struggles to accurately measure the contribution of the informal sector to the economy. Many Turkish citizens, especially women and low-skilled labourers, work in the informal sector, and the arrival of the Syrians have caused major displacement of Turkish workers, as they are more willing to work for lower compensation.

Prior to the arrival of the refugees, a persisting economic crisis had yet to be resolved. With the burden of Syrian refugees combined with a worsening economy caused by previous debts and problematic economic policies, the sentiments of Turkish citizens feel towards the refugees are changing for the worse. President Recep Tayyip Erdogen is well aware of this and despite formally being a champion for refugees, has seized the opportunity to turn Syrians into scapegoats to appease the public. As a result, the Turkish government has increased its efforts to encourage 'voluntary' returns of over a million refugees back to Syria.[3] In reality, however, the refugees are being arrested and forced to leave against their will, even if they technically still have the right to remain under previous agreements. Not only is this method unethical, it is also costly and inefficient in the long run.

Background

Refugee Crisis

While there were only around 8,000 refugees in Turkey when the Syrian war started in 2011, a year after the conflicts broke out, the numbers of refugees began to increase dramatically.[4] By 2019 a verification of registered Syrians under temporary protection successfully registered the data of more than 2.7 million Syrians.[5] The highest concentration of refugees in Turkey are currently found in Gaziantep, Hatay, Sanliurfa, and Mardin, where each province hosts more than 300,000 refugees.[6] Unsurprisingly, most refugees are located on the Turkish-Syrian border, but recent data has shown that they are spreading out with the second concentration in Istanbul. When the crisis started, Turkey had a generous open-door policy. Before 2014, the refugees had just been labeled as "guests" and no proper protection measures were taken. This means that many refugees were employed informally then and possibly even now. The reason being that Turkish leaders initially believed that the flow of refugees would be limited and temporary; clearly that was not the case. After the number of refugees started increasing rapidly in 2012, Turkey tried to bring its border and the influx of refugees under control using occasional border closings. However, after a series of terror attacks carried out by

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[1] United Nations High Commissioner for Refugees. (2020, June 18). Figures at a Glance. UNHCR. https://www.unhcr.org/figures-at-a-glance.html.

[2] United Nations High Commissioner for Refugees. (2020). Refugees and Asylum Seekers in Turkey. UNHCR Turkey. https://www.unhcr.org/tr/en/refugees-and-asylum-seekers-in-turkey.

[3] Gall, C. (2019, September 10). Turkey's Radical Plan: Send a Million Refugees Back to Syria. The New York Times. https://www.nytimes.com/2019/09/10/world/middleeast/turkey-syria-refugees-erdogan.html.

[4] United Nations High Commissioner for Refugees. (2020, January). Turkey: Regional Refugee and Resilience Plan in Response to the Syria Crisis. https://data2.unhcr.org/en/documents/download/72153.

[5] Ibid.

[6] United Nations High Commissioner for Refugees. (2021, January 6). Provincial Breakdown Syrian Refugees in Turkey. https://www.ecoi.net/en/file/local/2044151/UNHCR_Provincial+Breakdown+Syrian+Refugees+in+Turkey+-+January+2021.png.

Kurdish fighters that claimed the lives of hundreds of Turkish citizens and tourists, the government started to seriously tighten their border control. Before 2016, refugees could enter Turkey from anywhere without visas or any strict testing. Due to the increased security measure, they were now required to do so only through official posts and by land. Anyone who did not abide by the new regulations would be sent back or deported. However, even with the tightened border control, many Syrians are still arriving in Turkey, and while the EU provides aid, President Erdogan is still struggling to accommodate all the incoming refugees while also navigating Turkey's current economic crisis.[7]

Economic Crisis

President Erdogan has been in power since 2014 and prior to being elected as president, he was the prime minister from 2003-2014. In 2018 Turkey was known as having one of the fastest-growing economies in the world, having gained an upper hand over economic giants like China and India in 2017, even gaining a 7.22% growth in its GDP in the second quarter of 2018.[8] However, this strategy, composed of unrestrained borrowing, has caused deficits in both Turkey's fiscal and current accounts. While meant to be 'temporary' and changed in order to develop less reliance on external borrowing, the strategy still exists today. The first real warning that this could be problematic came in 2011 when the lira's value started to decline as a result of inflated foreign debts.[9] No real damage was done though, due to many national banks lowering interest rates for expansion. In the summer of 2018, however, the problem could no longer be avoided. The lira fell to 7.24 liras per US dollar following the arrest of US pastor Brunson and a threat from President Trump to destroy the Turkish economy, which caused a complete halt in foreign funding of Turkey.[10] Despite calming the situation down, future disagreements with Washington

and the direct interference by President Erdogan in Central Bank policies caused the crisis to escalate. President Erdogan's economic regulations in response to the resulting crisis, which include restriction of the national bank from raising interest rates in spite of inflation already being three times its target, did not seem to improve the situation.[11] The president, however, seems hopeful that things will work out and continues to hold out against any attempt to raise interest rates in order to curb the crisis. Unfortunately, the pandemic has only worsened Turkey's economic outlook, for the government responded with aggressive policy accommodations that rely on excessive credit growth and sale of the central bank's foreign-exchange reserves. This attempted to offset the capital outflows but only led to a further 40% loss in the lira's value.[12] Such a loss made all Turkish citizens take a big hit, and the already problematic refugee crisis became more magnified. President Erdogan has claimed that as of 2020, Turkey has spent close to $40 billion on aid for close to four million Syrian refugees.[13] This statement angered many Turkish taxpayers during the current economic downturn and Syrians have now been made the official scapegoats of the economic crisis. The Turkish media has also taken to reporting unsubstantiated facts, claiming that Syrians had priority over Turkish citizens in public hospitals and when receiving government pensions.[14]

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[7] Ibid.

[8] Lee, Y. N. (2018, August 13). What went wrong for Turkey? Its economy is 'in the midst of a perfect storm'. CNBC. https://www.cnbc.com/2018/08/13/turkey-crisis-economy-faces-weak-lira-inflation-debt-and-tariffs.html.

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[10] Ibid.

[11] BBC. (2018, August 10). Turkey's lira crisis explained. BBC News. https://www.bbc.com/news/world-europe-45142256.

[12] Kalemli-Ozcan, S., & Demiralp, S. (2021, January 6). Turkey's Slow-Motion Economic Crisis. Balkan Insight. https://balkaninsight.com/2021/01/05/turkeys-slow-motion-economic-crisis/.

[13] Pitel, L. (2020, January 21). Turkey eyes more EU aid as funding pays off for Syrian refugees. Financial Times. https://www.ft.com/content/7abb5212-1c2b-11ea-97df-cc63de1d73f4.

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Politics

Domestic Concerns

In Turkey only 2.4% of Syrian refugees live in camps, while the rest live in cities with native citizens. Istanbul hosts the highest number of refugees, with 548,000 registered Syrians in 2019.[15] Studies of the current sentiments of the Turkish public show that the Syrians are unwelcomed and often resented. In a poll conducted in 2019, 68% of Turkish respondents expressed discontent with the Syrian presence--a 10% increase from 2016.[16] Another poll conducted by the Piar Research group in the same year found that Turks had ranked solving the Syrian refugee crisis the second most important problem after the economy.[17] Even Syrians, who are already registered to live in Istanbul, have found that their initial welcome is fraying, especially as the government introduces new deportation legislation. Faced with a collapsing economy and the highest increase in unemployment rate in nearly a decade (14%), the Turkish public have decided to turn on Syrians.[18]

The government never intended for the Syrians to stay for an extended period of time, and with the growing dissatisfaction from Turkish citizens and the current economic situation, the government has been increasing its efforts in sending them back to Syria. Back in 2016 a deal was struck between Turkey and the European Union. A deal that would give Turkey $6.6 billion in aid, visa-free travel for its citizens in most of Europe and the eventual resumption of negotiations with Turkey on membership in the European Union.[19]

In exchange, Turkey would accept all of the refugees sent back from the rest of the EU. However, Turkey had ratified the Geneva Convention in 1951 with a geographical clause, which limited refugee status to people fleeing "events in Europe." This meant that the four million Syrians could not be considered refugees in Turkey, but instead "guests" under temporary protection. Many human rights organizations had opposed the 2016 deal, stating that Turkey was an unsafe/unfit nation to be hosting the refugees. The continuous economic downturn and unsystematic way of Turkey's refugee policies have made numerous nations skeptical about providing further aid and deterred investors from financially supporting Turkey, leading to even further deteriorating economic conditions in Turkey.

International Concerns

Many EU countries were petrified by the idea of the migrants flooding into the rest of Europe, so they turned a blind eye toward the conflict in Turkey.[20] Under President Erdoğan, the situation is worse than ever. In no-man's-land on the border between Greece and Turkey, thousands of refugees are kept from entering the nations. The countries are hoping that the prolonged disparity will push asylum seekers back across the River Evros.[21] Both nations are using tear gas, physical violence, and various other methods to discourage Syrians from seeking asylum. The authoritarian Turkish government has even started to detain their own journalists and citizens for reporting or expressing dissatisfaction with the government's actions. While the policy regarding Syrians in Turkey has not changed, policy changes in Istanbul are actively trying to send the Syrians away. By August 20, those who are not registered as being under temporary protection in Istanbul are still eligible for temporary protection but they have to register in a different Turkish province or face deportation. The government claims that they are supporting voluntary returns, but many of the returnees state that they have been forced to sign the 'voluntary return' form.[22]

[15] Karasapan, O. (2019, November 25). Turkey's Syrian refugees-the welcome fades. Brookings. https://www.brookings.edu/blog/future-development/2019/11/25/turkeys-syrian-refugees-the-welcome-fades/.

[16] Sonar, C. (2019, August 5). Growing Anti-Syrian Sentiment in Turkey. The Washington Institute. https://www.washingtoninstitute.org/policy-analysis/growing-anti-syrian-sentiment-turkey.

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[18] Ibid.

[19] Kanter, J. (2016, March 18). European Union Reaches Deal With Turkey to Return New Asylum Seekers. The New York Times. https://www.nytimes.com/2016/03/19/world/europe/european-union-turkey-refugees-migrants.html.

[20] Insel, A. (2020, March 10). Refugees held hostage by Turkey, Greece and the EU. VoxEurop. https://voxeurop.eu/en/refugees-held-hostage-by-turkey-greece-and-the-eu/.

[21] Ibid.

[22] Human Rights Watch. (2020, October 28). Turkey Forcibly Returning Syrians to Danger. Human Rights Watch. https://www.hrw.org/news/2019/07/26/turkey-forcibly-returning-syrians-danger.

Temporary Work Permits

While Syrian refugees were allowed to enter Turkey in 2011, the nation did not expect them to stay for so long or arrive in such large numbers; thus, the work policy set out for the refugees was less than favourable. According to Turkey's Regulation on Work Permits of Foreigners under Temporary Protection Act, foreigners under temporary protection can apply to the Ministry of Labour and Social Security for a work permit six months from the date on which they registered as being under temporary protection status.[23] At the workplace for which the work permit is requested, the number of temporary protection workers cannot exceed 10% of the Turkish citizens employed, unless the employer proves that there is no qualified Turkish citizen in the province who can perform the job being done by the foreign worker. Migrants under temporary protection also cannot be paid less than the minimum wage. Maximum of one migrant under temporary protection may be permitted to work at a workplace that employs fewer than ten.[24] While this policy may seem to allow for the employment of refugees, the requirements for a work permit were difficult and complicated. Not only does the refugee need to be recognized as someone under protection or have an ID, but also employers must apply on their behalf, pay taxes and social security, and pay at least the minimum wage. Theoretically, refugees who enter the country through official borders and have passports can apply for residency and work permits, but in reality, the policy makes it harder for the refugees to establish themselves in Turkey and serves as a deterrent for their long term stay.

Most employers prefer to not go through the complicated process needed to hire Syrian refugees; thus, only 60,000 work permits were issued by 2019.[25] According to a report by the UNHRC, "Assessments indicate that over 64% of urban Syrian households now live below the poverty line, including 18.4% who live below the extreme poverty line."[26] Many Syrians under temporary protection are increasingly exposed to risks and vulnerabilities that come from informal employment and poverty, such as exploitation, poor working conditions, and the general inability to become self-reliant. While they do have access to free healthcare and education, poverty, coupled with language difficulties, means that at least 40% of children have to remain out of school.[27] This becomes another barrier to Syrians entering the workforce, as the children would never be properly trained or educated. As a result, Syrians often have no choice but to rely on informal work.

The Informal Sector

The existence of an informal sector makes it particularly challenging for the government to regulate its economy. The informal sector supports economic activity that falls outside the regulated economy and tax system, such as street vending or unregistered taxi services. Businesses in the informal sector can usually adapt quickly to changing economic conditions because they can layoff or hire additional workers anytime they want; labour relations are based on personal and social relations instead of formal contracts and regulation. Turkey has an informal sector that is equal to 25–30% of official GDP and is the nation with the largest informal sector relative to GDP among the Organisation for Economic Co-operation and Development (OECD) members, an intergovernmental economic organisation founded in 1961 to stimulate economic progress and world trade.[28][29] From the 1950s through the 1980s, many Turkish citizens without higher education and were from rural areas had to seek work in the manufacturing industry, which prompted a mass migration into big cities. However, after 1980, the development of new

[23] United Nations High Commissioner for Refugees. (2016, January 11). Turkey: Regulation on Work Permits of Foreigners under Temporary Protection. Refworld. https://www.refworld.org/docid/582c71464.html

[24] Ibid.

[25] Karasapan, O. (2019, November 25). Turkey's Syrian refugees-the welcome fades. Brookings. https://www.brookings.edu/blog/future-development/2019/11/25/turkeys-syrian-refugees-the-welcome-fades/.

[26] Utas, C., Revel, B., & Nishimo, T. (2020). Outcome Monitoring Report 3RP Turkey Chapter 2018. United Nations: Inter-Agency Coordination Turkey. https://reliefweb.int/sites/reliefweb.int/files/resources/70022.pdf.

[27] Ibid.

[28] Pitel, L. (2020, January 21). Turkey eyes more EU aid as funding pays off for Syrian refugees. Subscribe to read | Financial Times. https://www.ft.com/content/7abb5212-1c2b-11ea-97df-cc63de1d73f4.

[29] Atesagaoglu, O. E., Elgin, C., & Oztunali, O. (2017). TFP growth in Turkey revisited: The effect of informal sector. Central Bank Review, 17(1), 11–17. https://doi.org/10.1016/j.cbrev.2017.02.002.

technology and the subsequent employment trends brought on by it led to a lower employment rate of low-skilled workers. But, with nowhere else to go, the workers migrate to cities anyway. So, with a high supply and low demand of low skilled workers, the expansion of the informal sector, especially in megacities like Istanbul, became inevitable.

Due, in part, to difficulty obtaining temporary work permits and the complicated refugee hiring process, the arrival of refugees have caused the size of the already large informal sector to increase. When thinking about the informal sector, most would attribute it to unqualified workers with limited education. However, as highlighted by Dr Ximena V. Del Carpio's and Professor Mathis Wagner's research, many Syrian refugees are unable to get formal work despite being overqualified, indicating that the government has no intention of promoting their long term stay. While officials may claim this as a way to ensure citizens keep their jobs, this approach has caused lowered wages and large-scale displacements of Turkish workers in the informal sector: approximately six natives for every ten refugees.[30] This has created unrest among citizens who are outraged at their loss of work and the substantial decline in the Turkish economy. Women are the group most affected, as most women in Turkey are of low status and do not have access to higher education.[31] The existence of refugees and the informal sector is not all bad, though. With the high influx of Syrians who are willing to work as long as they can get paid, Turkey can increase its production possibilities. A production increase can translate to more formal jobs opening up, which is beneficial to the economy. Nonetheless, due to the economic crisis in Turkey, the citizens are not able to wait for new jobs. Therefore, the only way to go about solving this issue would be for the government to increase its efforts in either regulating the informal sector, or finding some other way to integrate the earnings and workers into a semi-formal system.

[30] Del Carpio, Ximena V. & Wagner, Mathis. (2015, August 24). The Impact of Syrian Refugees on the Turkish Labor Market. World Bank Group. http://documents.worldbank.org/curated/en/505471468194980180/The-impact-of-Syrians-refugees-on-the-Turkish-labor-market.

[31] United Nations. (2017, May 9). Gender Equality. UNFPA Turkey. https://turkey.unfpa.org/en/node/9689#:~:text=According%20to%20the%20Gender%20Gap,country%20out%20of%20145%20countries.&text=As%20in%20many%20other%20aspects,(TurkStat%20Labor%20Statistics%202015).'

Recommendation

I believe that the most effective solution to the issues faced by Turkey is not to deport the refugees. Deportation will neither decrease debts, nor end the economic crisis. This would result in other nations finding more fault with Turkey and putting additional strain on already tense political relations. So, instead of adding fuel to the fire, Turkey should focus on regulating the informal sector and integrating refugees. This approach will not only be a more effective move towards solving the refugee crisis, but also help curb the economic crisis and bring about long term stability.

One of the main issues with the labour structure in Turkey is unemployment and the existence of an abnormally large and unregulated informal sector. As discussed, informal sector earnings are not part of the official GDP and therefore, are not subjected to taxes and other government regulations. This means that the government is unable to capitalize on profits that could be used toward boosting the economy. Prior to the arrival of Syrian refugees, many Turkish citizens, mainly women, relied on informal work for financial support. After the arrival of refugees and increased presence in the informal sector, Turkish workers lost their jobs. With the dire state of the economy, both citizens and refugees have become unable to properly support themselves, which has led to a reliance on government aid and support--this effectively traps citizens and refugees in a cycle of unemployment and poverty. So, while the informal sector provides easy access to employment and cheap labour, it is not a viable option for future economic prosperity. In the case of refugees, loosening work permit restrictions would be a good first step. The government can start by reviewing restrictions surrounding refugee work permits. This would not only reduce the size of the informal sector, but also lead to Syrians being less reliant on government aid. In addition to providing work permits, the government should also look into implementing vocational training programs. These programs would help refugees and low-skilled Turkish labourers in the informal sector. A significant reason for the large informal sector in the first place is the high unemployment and low literacy rate for women in Turkey. So, these skill-building programs can help improve the overall productivity and efficiency of the entire labour force in Turkey.

The next step would be to better integrate the refugees. Implementing regulation on the informal sector and giving Syrians work permits is one small solution, but if citizens continue to have anti-refugee sentiments, then it would be very hard for the government to approve these policies. Most refugees in Turkey are living among citizens and would be potentially working with them, so it is important that the integration process is dealt with systematically to limit civil unrest. To move forward, I propose a three-step plan: Information, Integration, and International Coordination.

1. Inform: With the crisis showing no signs of slowing down, there has been barely any room to dispel previously established prejudices that people have against Syrian refugees. Educating civilians on the different cultures is vital to dispelling stereotypes and erasing irrational fear. Campaigns that help educate civilians on the different cultures and true situation of refugees will help ease tensions. These lessons need to be taught in classrooms as well as to the general public, and they can be done through government organization with the help of already established NGOs that are dedicated to the cause.

2. Integration: In Turkey most of the refugee population already lives in cities among Turkish citizens. There have been claims that refugees are getting preferential treatment from the government; however, the rumours are unfounded and in order to move forward towards integration, accurate news needs to be reported. The government should also put more effort into integration instead of emphasizing the fact that the refugees are 'guests' and will leave eventually. They should allow refugee children to attend schools alongside Turkish children and establish more opportunities for community interaction.

3. International Cooperation: International cooperation and coordination between nations, the UN, and NGOs is vital to solving the refugee crisis. Turkey hosts one of the largest refugee populations in the world, and it is unreasonable that they should have to shoulder all of the responsibility. While it is understandable that other nations have their own domestic concerns and limited resources, it is the same situation everywhere. However, the solution of pushing refugees into other countries or forcing them back to Syria is only a short and highly immoral solution. So, Turkey could ask for more international cooperation: not only in terms of monetary aid, but also in accepting refugees.

Constraints

In order to implement the solutions mentioned above, there needs to be cooperation from the Turkish government, Turkish citizens and the international community. The Turkish government itself is the biggest problem at the moment. The current president is often seen as a polarizing force, but there is no sign of him stepping down anytime soon. Labour policy reforms and integration strategies usually require the government to take action, and nothing can be done without their cooperation. Another problem is the public sentiment. The citizens elect government representatives, and the government influences the citizens with their party ideals. So, in order to ensure the future success of the labour and social reforms, there needs to be change, cooperation, and contribution from both the government and its citizens.

Conclusion

The problem of Syrian refugees is an ongoing issue in Turkey, and is clear that it will not be ending anytime soon. The economic burden refugees place on Turkey is apparent; however, to blame an entire economic crisis on them is unreasonable. The biggest concern that the citizens have about refugees is that they are taking their jobs and depleting the nation of money by relying on government support. Even so, there has been no conclusive evidence of refugees replacing Turkish citizens in the formal workforce, and instead data shows that many refugees are working in the informal sector or unable to find employment due to government regulations. Solving the issue of the informal sector and refugee unemployment would automatically lead to Syrian refugees relying less on government support. Therefore, the focus of the government should be to change labour policies and integrate refugees because by doing so will prove to be more effective in the long run.

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Teachers' Mental Health Days:
A Research and Policy Proposal

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Yutong (Emily) Wang is a high school senior at the St. Andrew's Episcopal School in Maryland. She plans to major in Political Science and Psychology at the undergraduate level. Since March 2021, Emily has been working with the Montgomery County Education Association (MCEA) to incorporate the suggested policy recommendation as part of the MCEA agenda in advancing MCPS teacher's mental wellbeing. Her policy recommendation will also be featured on the Teaching Profession column of Education Week, a national news organization. Emily's research interests include improving mental health conditions for underrepresented groups, educational policy for teachers, and the influence of political partisanship in the American Education system.

ABSTRACT

School mental health research and policies tend to focus on enhancing the wellbeing of students more than that of teachers. Teaching is a stressful profession. Heavy workloads and high stress levels can cause teachers to develop mental health problems. Teachers' mental health has an impact on many aspects of society, ranging from students' academic and psychological outcomes to economic circumstances. This study investigates the development of a "Teachers' Mental Health Days" policy that would allow teachers to take days off from teaching for mental health reasons. A survey was undertaken between December 2020 and January 2021 to obtain feedback on this proposal. A total of 24 respondents at 12 public high schools and one private high school located within the Montgomery County Public Schools system (MCPS) agreed to participate. The findings suggest that some of the most prominent mental health problems that teachers face stem from the lack of mental health support and attention given to these issues by the Board of Education. The responses indicated high levels of interest in, and support for, a "Teachers' Mental Health Days" policy. I propose sanctioned leave or "Mental Health Leave" for teachers, which could potentially be made available for two days in every school year. Such leave would be paid, but without added employment benefits such as pension rights. Such a policy would not only provide teachers with an opportunity to help take care of their mental health, but would potentially benefit other groups, including but not limited to students, parents, and board officials.

Keywords: mental health, high school teachers, teacher welfare, school mental health, teaching load, educational policy

Introduction

In recent years, the topic of mental health at school has attracted attention from researchers, practitioners, and policymakers. Recent policy efforts related to school mental health have focused on improving the mental wellbeing of the student population. Public health and education policies directed at benefitting school mental health include the House Bill of 2191 (HB 2191, 2019), which allows high school students to take days off from school for mental health reasons as "Excused Absences." In addition, the Mental Health Service for Students Act (H.R. 1109, 2020) offers funding to provide mental health care services for students in public high schools.

Despite progress made in advancing students' mental health, a significant population has been excluded from the effort to promote school mental health, namely teachers. Teaching is a stressful profession and yet it comes with an inadequate amount of mental health support. Data from the 2017 Educator Quality of Life survey revealed that 61% of teachers find their work to be "always" or "often" stressful. Moreover, many teachers from that survey reported having poor mental health for 11 or more days per month, and other poor health outcomes, such as a lack of quality sleep (BATs, 2017).

From a humanitarian perspective, mental health could be regarded as a basic human right (Nagaraja and Murthy, 2008). Mental health does not discriminate on the basis of race, gender, or socio-economic status, and without proper support, mental illness quickly becomes severe. Therefore, it is reasonable for teachers and students to be given the same amount of attention and support in the development of effective strategies to enhance mental health at school. Findings from a national survey on school mental health indicated that 84% of educators reported moderate to significant mental health challenges. This number is similar to the 83% of students who reported mental health challenges (Young, 2020).

Mental health challenges

Teachers' mental health challenges contribute to both micro-level (at the individual school and community level) and macro-level issues (at the national level). At a micro scale, poor mental health may lead to low teaching performance and engagement, which has a negative impact on students' academic and psychological wellbeing. Findings from a 2009 Gallup study showed that teachers' levels of engagement were directly associated with the engagement levels of their students, which in turn affected student achievement outcomes. For a 1% increase in a school's average student engagement level, there was a 6% increase in reading and an 8% gain in math achievement (Bidwell, 2014). Additionally, improved psychological wellbeing among teachers was associated with better student wellbeing (standardized effect = 0.07) and lower student psychological distress (standardized effect $=-0.10$) (Harding et al., 2019).

From a macro-level standpoint, high teacher turnover as a direct result of poor mental health can lead to social inequality and economic damage. Such damage includes but is not limited to the widening of achievement gaps that disproportionately affect underserved student populations, as well as increased state and national attribution costs. The annual U.S. teacher turnover rate is 16% (Grace et al., 2016), with low pay and high levels of stress as the most common reasons cited for leaving the profession. Public schools in areas of high poverty experience 50% higher teacher turnover rates compared to more affluent public schools (Murnane & Steele, 2007). Furthermore, students tend to score lower in English Language Arts (ELA) and math when a higher turnover rate is presented. This trend is particularly reflected in Title I schools and schools with a higher prevalence of low performing and black students (Ronfeldt, Loeb, and Wyckoff, 2012).

The widening achievement gap and economic damage caused by high teacher turnover are interconnected. It is estimated that, on average, states in the U.S. spend up to 2.2 billion dollars annually on teachers' attrition turnover (Haynes, 2014), which costs about $7.3 billion in U.S. schools each year (The National Commission on Teaching & America's Future). If a large amount of the budget from U.S. schools each year goes to teachers' attrition, then schools have a reduced budget available for improving

school activities, such as school wellness programs, academic improvement programs, and professional development opportunities.
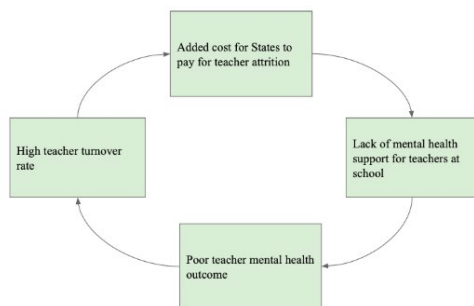

Figure 1. The vicious cycle of poor mental health in teachers (EW, 2021)

Current initiatives taken by the teachers' union to improve teachers' mental health include the development of a "mental health day" for teachers. For instance, the FairFax Education Association (FEA) and the Washington Teachers Union have been urging members to take a mental health day because of growing mental health risks in the teaching workforce. More recently, the FEA stated that the union has been helping its members obtain counseling and medical attention due to the added stress caused by COVID-19 (Hillerich, 2020).

Common causes of mental health problems among teachers

This section aims to provide a general background on some of the most common causes of mental health problems among teachers, and to discuss potential factors that prevent teachers from seeking help.

Heavy workload and a lack of work/life balance

There has been an increase in expectations from students and the public on the roles and responsibilities of teachers (Berlanda et al., 2019). The U.S. Bureau of Labor Statistics found that teachers were more likely to work on the weekend than the average American professional (Krantz-Kent, 2008).

Furthermore, teachers work an average of 10 hours and 40 minutes per day, which is more than three hours beyond the average workday required in public schools nationwide (Scholastic and the Bill & Melinda Gates Foundation, 2012). Besides helping students to excel academically, teachers are also responsible for helping students with social and emotional growth. Recent studies have shown that teachers are often the first to report child maltreatment, but the amount of reporting decreased during the COVID-19 pandemic because of the lack of direct contact between teachers and students (Barron, Goldstein, and Wallace, 2020; U.S. Department of Health & Human Services, 2019).

It is unarguable that teachers bear many important responsibilities, having a crucial impact on the attainment and outcomes of students. However, more attention needs to be paid to issues relating to the duration of teachers' work, their workloads, and their poor work/life balance.

A lack of autonomy and influence

"Teacher autonomy is defined and measured by one's capacity to take control of one's own teaching" (Sehrawat, 2014). According to a study from the National Foundation for Education Research, teachers are 16% less likely than similar professionals to report having "a lot" of influence over how they do their job, especially with relatively low autonomy over assessment and feedback (Worth & Brande, 2020).

The inability to make direct impacts in the classroom and the school community, and the lack of attention and value attached to a teacher's feedback creates a strong sense of powerlessness among teachers. Thus, such factors have psychological consequences, including tension, frustration, and anxiety (Pearson & Moomaw, 2005).

Bullying

Workforce bullying is prominent in the teaching industry. Teachers experience bullying by superiors, colleagues, students, or parents at rates far higher than those reported for other professions (BATs, 2017). While many research studies have focused on teachers bullying students, a limited number of studies have investigated the bullying behaviors exhibited by students toward teachers (James et al., 2008). Student bullying behaviors directed at teachers include

abusing, ignoring, swearing, mocking, gossiping about teachers, and damaging teachers' belongings (Pervin & Turner, 1998; Terry, 1998). Previous studies have concluded that student bullying behaviors towards teachers may affect the mood and performance of teachers, in addition to student learning (Pervin and Turner, 1998; Terry, 1998; Benefield, 2004; De Wet and Jacobs, 2006).

Barriers to help-seeking

Stigma on mental health

Negative attitudes and stigma towards mental illness are evident among teachers. Recent evidence suggests that 70% of higher secondary school teachers exhibit an overall agreement with the personal and perceived stigma towards a depressive case vignette (Venkataraman, Patil, and Balasundaram, 2019). It is important to enhance the understanding and awareness of mental illness in the teaching workforce so that teachers become more willing and comfortable to reach out for help when dealing with mental health challenges (Gur et al., 2012).

The National Institute of Mental Health (NIMH) summarizes that teachers and other school staff who experience exhaustion and burnout related to their work are more likely to have negative physical and psychological symptoms and consequences (Lever, Mathis, and Mayworm, 2017), including:

1. Emotional numbing
2. Loss of enjoyment
3. Lack of energy
4. A sense of cynicism or pessimism
5. Increased illness or fatigue
6. Increased absenteeism and "sick days".

The Present Study

A survey was conducted on 522 high school teachers from public and private high schools located in Montgomery County, Maryland between October 2020 and January 2021. Montgomery County is one of the wealthiest counties in the United States, with a median household income of $99,435 (Montgomery County government, 2021). The Montgomery County Public Schools (MCPS) system is the largest school system in Maryland and the 14th largest school system in the United States. MCPS has 25 public high schools and 47 private high schools. Out of the 13,142 MCPS teachers, 86.4% have a master's degree or equivalent (Department of Public Information and Web Services Montgomery County Public Schools, 2018).

Method

Participants

A sample of twelve MCPS public high schools and one private high school were selected. Six public high schools were randomly selected based on schools that ranked in the top 12 (Group A). The other six public high schools were randomly selected from a ranking of 13th to 24th (Group B). The average graduation rate was approximately 94% for Group A and 84% for Group B. The college readiness index was about 69 out of 100 for Group A and 39 out of 100 for Group B.

Procedure

The online survey was first provided to Group A and a follow up request was sent after 3 days. Afterwards, the survey was sent to Group B, and the follow-up process was repeated. This technique was used to help compare the responses from teachers between the two groups. Lastly, the survey was sent to teachers at the private high school, after which the follow up process was repeated.

Measures

The survey consisted of seven multiple choice questions, three of which could be answered by "yes," "no," or "not sure." The survey included one qualitative open free-text question, asking teachers to provide additional thoughts on the idea of high school teachers taking mental health days off during the school year. Throughout the survey, responses remained confidential and anonymous. The survey was conducted under the supervision of my mentor, Dr. Roger P. Worthington, with additional input from a private school teacher.

Results

Overall, 24 teachers from twelve public high schools in Montgomery County and one private high school participated in the study. The crude response rate of this survey was 4.6%. With respect to the school types, 83.3% [n = 20/24] of respondents were from Group A, 8.33% [n = 2/24] were from Group B and 8.33% [n = 2/24] were from the private school.

1. Do teachers think they need mental health days?'

The participants were asked to select an option from the choice, 'yes', 'no', and 'not sure' that best reflected their belief on the need for mental health days for teachers. About 79.2% of the participants reported "Yes" and 20.8% of the participants were not sure. No one reported "No". In short, over half of the participants confirmed that mental health days are considered important for teachers.
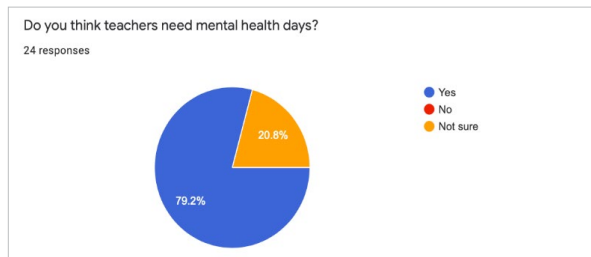

2. 'Do teachers think allowing more mental health days for teachers would improve teachers' performance in the classroom?'

The participants were asked to select an option from the choice, 'yes', 'no', and 'not sure' that best reflected their belief on whether or not allowing more mental health days for teachers would improve teachers' performance in the classroom. About 83.3% of the participants reported "yes" and 16.7% reported "not sure". No one reported "No" to this question. Thus more than half of the teachers think mental health days for teachers would improve teachers' performance in the classroom.
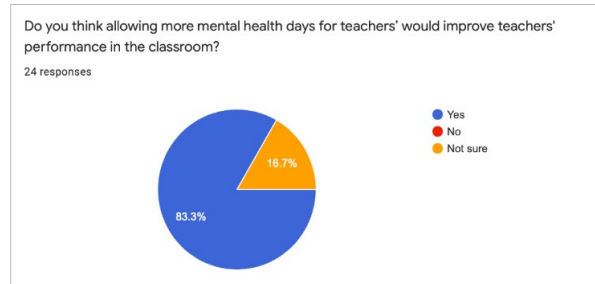
3. 'Do you think allowing more mental health days for teachers would improve students' performance in the classroom?'

Participants were asked to select an option from the choice, 'yes', 'no', and 'not sure' that best reflected their belief on whether or not allowing more mental health days for teachers' would improve student performance in the classroom. About 54.2 % of the participants answered "yes", 16.7% answered "no" and 29.2% were "not sure". Of note, 16.7% disagreed with the assumption and it is important to understand why they felt that allowing more mental health days for teachers would not improve students' performance in the classroom.
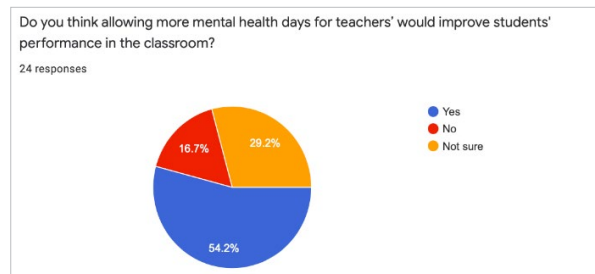
4. 'Do you think mental health days should be paid or unpaid?'

Participants were asked to select an option from the choice, 'paid' or 'unpaid' that best reflected their view on whether mental health days should be paid or unpaid. While 95.8 % (23 out of 24) selected 'paid', 4.2% selected 'unpaid'. Almost all participants think that mental health days should be paid. This provides strong evidence to support the principle of paid benefits for Mental Health Leave.
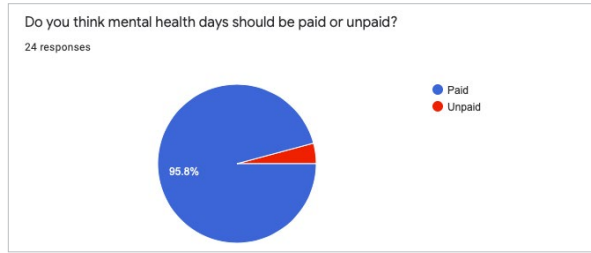
Qualitative Results

One optional open-ended question asked teachers for additional thoughts on the idea of high school teachers taking mental health days off during the school year. Among the 24 participants, 15 provided qualitative responses. Based on the common responding patterns, those responses fell into one of the four categories: Teacher burnout, Lack of autonomy, Workload, and More "Sick Days." One response per category was selected to illustrate aspects of teachers' mental health struggles.

Teacher burnout

Most teachers' responses in this category highlight the prevalence of exhaustion due to stress, negative feelings, and pressure from work.

"Teacher burnout is very real, especially in an online teaching environment. Many teachers do not take off when they need a break because it is often more challenging and stressful to write sub plans than to just come in. Teachers also get very little leave, so do not want to 'waste' a day in this fashion."

Lack of autonomy

Many responses from teachers reported a low level of control over their teaching and school policies. Many felt that their voices and feedback were not valued by the school administration or the Board of Education.
"I have been a public servant since 1987, and I promise you that no one cares what I think."

Workload

Heavy workload and the work/life imbalance was a common theme in many of the responses.

"I know many teachers already take mental health days, but we use them to do college recommendations and catch up on grading. In reality they are days we need to do the work we cannot fit in during and after school hours. We will likely have the same number of sick days, just able to call them mental health. Most of us already do this. I have been under a doctor's care for mental health for over a decade, so I do see it as a 'sick day' – again the difference is I work the whole time because the backlog of work is causing me anxiety. The best way to improve teachers' mental health is to reduce class sizes and give teachers more planning time during the day so we don't spend all of our nights and weekends grading and planning."

More "sick days"

Additional sick days were mentioned by several responders, and many believe that allowing teachers more paid sick days could help improve a teacher's general wellbeing.

"My honest reaction is that the solution to this is to provide teachers with one or two extra sick days a year and allow them to use a single sick day without requiring an explanation. I worry about this showing up on employment records."

Policy Recommendations

Based on findings from the survey and further analysis of the problems, I would recommend the following:

a. Two teachers' mental health days for one school year

The number of absences recorded as "absent without available leave" (AWAL) has been increasing among MCPS teachers. In the 2016-2017 school year, there were over 22,000 days of unpaid leave used after employees exhausted their available paid leave (Zuckerman, 2018). Approximately 23,000 educators were working in MCPS schools during the 2016-2017 school year (MCPS Annual Report for School Year 2016-2017). On average, educators exceed the 12 paid sick leave days per year limit by taking an average of two (23,000/22,000) additional unpaid sick leaves

per year. Because educators, including teachers, are already taking two AWAL days, classifying these additional sick leave days as "teachers' mental health days" might make good sense.

b. One teachers' mental health day per semester

The limitation of teachers using one teachers' mental health day per semester serves as a check on this policy to prevent situations in which teachers take multiple teachers' mental health days in one semester. Teachers could use one teachers' mental health day at any time during a semester and should not exceed that number. However, teachers could still take paid sick leave days if available. The paid leave benefits of teachers' mental health days would not apply to officially authorized paid leave.

c. Teachers' mental health days should be paid

Teachers usually work more than three hours beyond the required work hours per day (Scholastic and the Bill & Melinda Gates Foundation, 2012); qualitative responses from the survey demonstrate the heavy workload that many MCPS teachers are facing, and 95.8% of respondents think that mental health days should be paid. In Article 16, Section B of the Montgomery County Education Association and Board of Education of Montgomery County Contract Agreement for the School years 2018-2020, it states that, "While professional personnel will often work more than eight hours per day, the professional salary schedule is based on an eight-hour workday." If both the Montgomery County Education Association and the Montgomery County Board of Education acknowledge the unbalanced rate between salary and teachers' work hours, it is reasonable to compensate teachers through paid leave benefits.

d. Similar procedure to paid sick leave

Teachers should follow similar guidelines to paid sick leave days when requesting mental health days. For instance, they should complete the MCPS Form 430-1A (September 2020 version), "notifying the appropriate official as early as possible if he/she is unable to report for duty" (Article 30, section C of the Montgomery County Education Association and Board of Education of Montgomery County Contract Agreement for the School Years 2018-2020). Amending teaching contracts before implementing

the "Teachers' Mental Health Days" policy may be necessary. For example, I recommend that teachers should not have to state specific reasons to the appropriate officials when requesting mental health days. Teachers' mental health days should also be recognized as an official type of leave in the teachers' contract and the leave request form with proper descriptions that explain the purpose and limitations (please see Formal documentation for more details).

e. No accumulation

Teachers' mental health days would expire before the start of the next school year. Unused mental health days would not be available for use in the next school year. The reason for this is to provide teachers with as much mental health care as possible while keeping a balance between teachers and other populations at MCPS. If this "Teachers' Mental Health Day" policy becomes sanctioned, follow-up, larger scale surveys and pilot studies would be needed to assess the effectiveness of this policy, with opportunities for revision and readjustment based on feedback from teachers, students, parents, policymakers, and other stakeholders.

f. No added benefits

Teachers' mental health days would not have any added benefits as included in the "Paid Sick Leave Days" policy. For instance, teachers could not cash-out unused mental health days, and unused mental health days would not be added to retirement benefits, partly to encourage teachers to take better care of their mental health. Some teachers are unwilling to use paid sick leave days to take care of their mental health due to the benefits that the "Paid Sick Leave Days" policy includes. Teachers need an opportunity to take care of their mental health without worrying about loss of benefits.

g. Formal documentation

Teachers' mental health days could be categorized as an official type of leave (mental health leave) to differentiate between paid sick leave and mental health leave. Mental health leave should not be included under paid sick leave because:

- The name "sick leave" is not a suitable representation of mental health leave. Mental

health should be regarded as a human right, and teachers should be provided with equitable care and opportunities to help them secure this right. Anyone could have mental health problems, and if not addressed in time, it can lead to more serious problems that could then require the use of sick leave.

- There are different procedures and benefits between paid sick leave and mental health leave; mental health leave should be given its own description that explains the purpose, qualifications, and limitations.

Due to the differences between mental health leave and paid sick leave, it is important to organize mental health leave in a separate column with proper descriptions that explain the type of leave. This could also serve an educational purpose to help inform teachers about the importance of taking care of their mental health and reduce the stigma surrounding mental health in the teaching workforce.

h. Anticipated benefits

Benefits for teachers

- Provide teachers with an opportunity to take better care of their mental health
- Salary benefit protection for taking mental health days
- Fewer AWAL days
- Spread awareness and reduce the stigma associated with mental health
- Help prevent more serious mental health and psychological problems from developing
- Encourage teachers to voice their concerns

Benefits for students

- Potentially improved academic outcomes
- Potentially improved psychological outcomes
- Learn about the importance of mental health
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Benefits for the County

- Reduce teacher turnover rate
- Reduce added costs due to high teacher turnover rate
- Reduce unpaid sick leave or AWAL

According to NIMH, increased absenteeism and sick days among teachers are a direct consequence of teachers who experience exhaustion and burnout related to work (Lever, Mathis, & Mayworm, 2017). If MCPS wishes to reduce absenteeism or excessive use of unpaid sick leave among teachers, then introduction of the "Teachers' Mental Health Days" policy is a good first step strategy to help reflect on the county's academic and social reputation and show teachers that their voices are being heard and valued.

Limitations

There are clear limitations to this preliminary investigation. This pilot survey aimed at providing a basic foundation for later research and replications. Given the relatively small sample size, a larger survey pool and more respondents would be needed for generalizability. Sick leave banks and teacher insurance were not included within the scope of this research, but they could be investigated to help inform any new policy. While the current data showed that more teachers in Group A responded to the survey than those in Group B, no demographic and socio-economic data were collected, including information about racial profiles or the mental health of teachers. However, future studies may need to take account of such socio-demographic variables.

Conclusions

Research on teachers' mental health is limited, and further comprehensive surveys may need to be carried out. The quantitative data in our research indicated a need for more mental health support for teachers that could be achieved through introducing a Mental Health Leave policy. The qualitative findings indicated the struggle that some teachers are currently facing due to low levels of mental health, mainly caused by workloads. Thus, introduction of a policy such as the one described could ultimately help to improve teachers' mental health.

Acknowledgments

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COVID-19 Vaccination and the Ethics of Global Health

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Luxi (Lucy) Yu is a 16-year-old rising senior at Boston Latin School where she is actively engaged in many clubs and extracurriculars, such as Science Olympiad, Red Cross, Dance Club, and the Boston Latin Fencing Team. Outside of school, she enjoys playing the violin, running a Youtube music channel, and spending time with her pet beagle. Lucy is passionate about the intersection between Social Justice Advocacy and Healthcare. In college, Lucy hopes to study Biomedical Studies and Health Policy.

ABSTRACT

The development of COVID-19 vaccines in the face of the global pandemic has been an unprecedentedly quick process, resulting in the release of a number of new vaccines in under a year. However, the global distribution of such vaccines faces major roadblocks, especially concerning questions of equity. This paper investigates governance and procedural processes for conducting human trials and developing vaccines, with a US-centric focus; it compares different COVID-19 vaccine candidates and their attributes, and it examines challenges around COVID-19 vaccination roll-out from a global justice perspective. The paper discusses current initiatives for global distribution, such as COVAX, as well as the need for improvements further down the road. This review paper includes personal observations regarding the challenges of COVID-19 vaccination, focusing on questions of ethics and global justice. Not only do some vaccine characteristics limit global distribution (e.g. low storage temperatures), but issues such as wealth inequality and vaccine availability also present additional challenges. As seen in the 2020 pandemic, wealthy countries largely take an individualistic approach towards vaccination, thus limiting access to inoculation for underdeveloped and less wealthy countries. Although there has been significant progress in vaccine development since the beginning of the pandemic, there is still much work to be done to ensure effective roll-out in a way that promotes global justice to help boost global immunity and protect populations from the devastating effects of this virus.

Keywords: COVID-19, Governance, Global Justice, Equity, Distribution, Vaccination

Introduction

Global pandemics have devastated global populations over the course of human history, and the COVID-19 pandemic is no different. Despite the development of effective vaccine technology, this ever-changing disease continues to present a host of ongoing challenges regarding distribution and public health. Although the world has come a long way since March 2020, there is still a long way ahead and many facets to consider before the world can reach global herd immunity. This paper presents an overview of research carried out over the span of three months, focusing on COVID-19 vaccination, ethics, and the governance of public health.

Overall, this research project was designed to achieve four major goals, the first of which is an understanding of governance. To better understand the technical procedures of vaccine development, the first goal sought to explore the legalities and guidelines surrounding clinical trials. The analysis of these procedures was then expanded to further understand which COVID-19 vaccines had either already undergone, or were being subject to, such guidelines. This meant understanding which vaccines were on the market, which phase of development they were in, as well as their various characteristics. The next major goal was to take a more global perspective by examining the various roadblocks or challenges to distributing said vaccines after approval. Last but not least, the fourth and final aim was to research and understand the barriers surrounding global justice, or why these vaccines may not reach all populations equally, even after approval.

The significance of this research project is connected to the date March 11, 2020, also known as the date that the World Health Organization (WHO) declared the COVID-19 situation to be a pandemic. COVID-19 is undoubtedly a reality that the world has been living with for more than a year and has claimed the lives of more than 2.7 million people globally (*Cumulative Confirmed COVID-19 Deaths, 2021*). Thus, naturally, the topic of vaccination and reaching a solution holds a constant relevance and will continue to for the next few months or even years as the world tries to recover from the current situation. Additionally, one specific figure that contributed to an interest in this research is linked with the United States. Overall,

COVID cases in the US seemed to be on a general decline as of March 2021 (*Coronavirus in the U.S.: Latest Map and Case Count, 2020*), while global cases seemed to be rising again (*COVID Live Update*, 2021). This figure prompted further research to address not only the cause of these statistics but also what the world was doing wrong from a justice standpoint to ensure equal access to COVID-19 relief.

Before going further into an explanation of the research itself, four baseline realities of the research must be addressed to better frame the findings. The first is that there exists inequity regarding vaccine distribution in the first place. It would be ignorant to assume that this inequity is common knowledge, and yet it is something that not many people think about or even realize, especially in more wealthy countries such as the United States, which has a lot of resources compared to many other countries. Secondly, another reality is that no two vaccines are identical and that different vaccines have different advantages based on their individual distinctions (which will be explained further on). The third reality is that the world does indeed face many roadblocks in equally distributing these vaccines. Lastly, although this project looks at certain instances of distribution and social justice beyond the United States, the rest of this project adopts a largely US-centric focus for simplicity's sake.

Method

This project included a sample literature review using search engines such as Google Scholar, PubMed, and The Lancet, choosing articles to help with my analysis. When searching for sources, there was no initial date restriction due to the fairly current topic of research. However, the end date was restricted to March 31, 2021, as it would be unrealistic to try to constantly keep up with every piece of new information. Important keywords that were used to locate references included: COVID vaccines, vaccine approval, for-profit, efficacy, medical governance, medical ethics, clinical ethics, and clinical governance. Lastly, to categorize the research, a Qualitative Thematic Analysis method was employed to find commonalities between sources that guided the conclusions.

Findings

Governance

One of the first steps to understanding vaccines is to understand the basic governance and ethics of clinical research. The root of ethics and governance is to protect subjects of clinical trials as well as their communities from being harmed by the research. A big part of this is transparency and making sure that the subjects know what they're agreeing to as well as potential consequences (physical, or in their wider community) that could result from their participation. Furthermore, a major priority when talking about governance and ethics is the idea of patient consent. After the Nuremberg trials after WWII, the world needed to prevent anything so criminal from happening ever again, particularly regarding human experimentation.

In an industry as essential yet risky as clinical medicine, measures must be established to ensure the safety of participants in clinical trials as well as the general public. Even for those who may not be directly participating in the trial, due to larger potential social or cultural impacts of trials, communities are generally at risk of being adversely impacted. Specifically, in the case of America, due to a significant amount of clinical trials being outsourced to other countries with fewer regulations, this puts the participant and wider society at risk of being exploited and treated unsafely. That then is where the Institutional Review Board (IRB) comes in. An Institutional Review Board according to the Food and Drug Administration (FDA) is a "group that has been formally designated to review and monitor biomedical research involving human subjects" (Center for Drug Evaluation and Research, 2019, para.1). IRBs have jurisdiction over the approval, modification, monitoring, or in some cases the disapproval of proposed clinical research involving human participation. These decisions are made primarily to ensure the safety and protection of such subjects and are measured by the standards of ethical principles. Federal regulations include a host of different guidelines, mostly from the FDA (regarding research in the United States), the Office for Human Research Protections, and other branches of government under the United States Department of Health and Human Services (U.S. Department of Health & Human Services, 2016).

After approval by an IRB, the most widely accepted method of clinical research, called Randomized Controlled Trials (RCTs), is most often used to collect data concerning the safety and efficacy of the intervention of interest. RCTs are considered the most reliable method of research due to their ability to "minimize the risk of confounding factors influencing the results" (Akobeng, 2005, p. 840). During RCTs, research participants are randomly split into two groups, typically, either two treatment options or a treatment and a placebo, observed for a specific amount of time with all other factors being held constant. Thus, any observable differences would be able to be attributed to the difference in treatment. The reliability of RCTs can be attributed to the randomization of participants placed in each group, which can minimize the impact of participant variability on the results (Kabisch et al., 2011).

Lastly, on a more macro level, clinical research has to go through 4 different phases of clinical trials to gather data on safety and efficacy (*Types and Phases of Clinical Trials*, 2020). In the first phase, according to the American Cancer Society, the treatment is tested on "up to a few dozen" participants (*Types and Phases of Clinical Trials*, 2020). In this phase, the most important factor is whether the new treatment is safe to use on humans, this being the first few trials that are conducted on humans (*Types and Phases of Clinical Trials*, 2020). Then in the second phase, the sample group increases to a few hundred, and further research is carried out to determine safety and efficacy. Then in the third phase, the sample size increases to a few thousand, and it is also compared to standard-of-care treatment. Often, in this phase, double-blind studies are utilized to minimize biases and ensure randomization on both the conducting end as well as the subject end. After Phase III trials are completed (e.g., in the United States) with sufficient efficacy data that demonstrates an advantage, a new drug application is submitted to the FDA for approval. Finally, the fourth phase, which takes place after FDA approval, is carried out in the early stages of roll-out for additional data collection, mostly for safety surveillance.

Vaccine Candidates

Despite aiming for a unified objective, every vaccine is different and has different characteristics. In this paper, the focus is on accessibility, convenience,

and distribution. Four of the major characteristics to consider when analyzing and comparing vaccines are vaccine type, storage temperature, number of doses, and cost per dose. As for the type, there isn't much evidence of an advantage provided by certain types, but there is more of a precedent and knowledge surrounding certain types more than others. For example, regarding the new mRNA technology used in Pfizer and Moderna's vaccines, this method is relatively more novel in comparison with inactivated viral vaccines, which are a lot more commonplace. This is significant because, from a distribution standpoint, it could serve as an influencing factor that could increase vaccine hesitancy. Particularly when the Pfizer and Moderna vaccines first received emergency approval, there was an initial sentiment of skepticism among many who were wary of this supposedly "never done before" method.

Another important consideration is temperature: the lower the temperature required for vaccine storage, the harder it is to store and distribute the vaccine. This is why Astra-Zeneca is seen as a more convenient and widely distributable vaccine than Pfizer, which is required to be stored at lower than -70 degrees Celsius. Furthermore, the number of doses is also an important consideration when looking at vaccines. Only administering one dose is certainly more convenient than administering two, each a month apart, which is why the development of the J&J vaccine was almost revolutionary in vaccine production, as it only requires the administration of a single dose (Wouters et al., 2021).

The final consideration is cost, and although vaccines are generally free to the public, the cost is a vital factor, especially when looking at this from a social justice lens. Poorer countries that don't have the money to spend on vaccines naturally cannot afford more expensive vaccines without financial assistance.

Distribution

The development and approval of vaccines for use in controlling the spread of Covid-19 is undoubtedly a major step. However, it is one thing to develop vaccines, and it is another challenge to get these vaccines into the arms of people around the world. When talking about vaccine distribution and

its intersection with social justice, the critical issues are affordability, physical distribution, supply, and healthcare infrastructure (Wouters et al., 2021). Each country has varying levels of each of these components, and it is important to look at them from an intersectional perspective because vaccine distribution can only run well if every criterion is accounted for.

Currently, the premier initiative focusing on this issue is the COVID-19 Vaccines Global Access (Covax) program, which is an organization launched by the Coalition for Epidemic Preparedness Innovations (CEPI), WHO, and The Vaccine Alliance (Gavi) to serve as a platform for global vaccine allocation. Not only does this program support the research of vaccine candidates, but it also helps to provide funding for such research to benefit lower-income nations or self-operating nations that won't have access to vaccines otherwise (*COVAX Explained*, 2021). Under this Covax initiative, countries can request enough vaccines to vaccinate between 10-50% of their population. On the Covax distribution side of things, the Covax Facility, or the pooling mechanism of participating nations, concluded deals with various vaccine manufacturers to allocate doses before these vaccines were approved in their countries of production.

While the Covax Facility runs on a pooling system, a lot of Covax's money used to buy these vaccines has "been donated mostly by Western governments and charitable groups, such as the Bill & Melinda Gates Foundation" (Steinhauser, 2021, para. 2). Thus far in 2021, Covax has made deals with companies such as Johnson and Johnson, Novavax, and Pfizer. However, most of the vaccines being distributed will be AstraZeneca, which is expected to make up around a third of Covax's COVID supplies (Steinhauser, 2021). In terms of the United States, the Trump administration denied participation in the initiative. However, with the advent of the Biden administration, the United States has pledged a four-billion-dollar contribution to the Covax facilities.

Despite the benefits of Covax, wealthier countries are sometimes scrambling to buy up all the vaccines before Covax can get to them, causing rollout to slow down significantly. As summarized by Wouters et al. (2021, p.1027), "Scarcity in supply coupled with the large volumes of pre-orders made by richer countries creates challenges to achieving timely, universal access". Even if Covax were to accomplish

its goal of vaccinating 20% of every country by the end of 2021, there would still be a long road ahead to achieving herd immunity in a timely fashion (Katz et al., 2021). Although these wealthy countries think they are getting an upper hand, the reality is that no one is safe until everyone is safe, which is a call for a more unified approach that every country must heed before the world can overcome this pandemic. This sentiment is equally reflected by the Access to COVID-19 Tools Accelerator (ACT-A) initiative, in which the governments of 28 different countries came together to pledge international cooperation, agreeing that, "at a time when COVID-19 has exploited our weaknesses and divisions, we must seize this opportunity and come together as a global community for peaceful cooperation that extends beyond this crisis" (*COVID-19 Shows Why United Action Is Needed for More Robust International Health Architecture*, 2021, para. 10).

Inequalities that are present globally right now can be illustrated by a quick comparison of the United States, a very wealthy country, and Brazil, a country of similar size but less wealth. According to data from the Centers for Disease Control and Prevention (CDC, 2020), almost one-fifth of the United States population has been fully vaccinated, and about one-third of the US population has received at least one dose [at the time of writing]. This is a huge step toward overcoming COVID in the United States and stands in stark contrast to vaccination rates in Brazil. Even under the aid of Covax, at this rate, it will take Brazil more than 46 more days to vaccinate a mere 10% of its entire population (Bhatia et al., 2021), which is a huge issue for them as well as for the world's pandemic efforts.

Although there is still a long road ahead to herd immunity, there are several steps that countries can take to lessen the current disparities in distribution. Looking forward, vaccine companies need to focus on expanding production capacity. Now that several vaccines have been proved, and many more are well on their way toward approval, it is imperative to ensure that the production process picks up speed and can be efficiently delivered to distribution sites across the world. Secondly, to promote accessibility, vaccine companies must ensure the affordability of the vaccines. According to Wouters et al. (2021):
Mechanisms are needed to ensure the affordability and sustainable financing of COVID-19 vaccines in low-income and middle-income countries, which are home to about 85% of the global population and which

might lack the resources to buy adequate quantities of vaccines. Even in high-income countries, it is important to ensure access to COVID-19 vaccines for poor and marginalized populations. (p. 1025)
Similarly, governments must strive for equal global allocation as well as adopting a more global approach. Although in the short term it may appear to more wealthy countries that prioritizing their own countries over the rest of the world will lead to quicker normalcy, in the long run, this is not the case.

Eventually, as the world begins to open back up, the disparities between COVID conditions in less wealthy countries and world leaders will become an even bigger issue. This is why right now governments, as well as the private sector, must move forward together and prioritize the global community rather than individual countries that have the funds to secure large amounts of vaccines. Moving forward, governments should also secure further funding for Covax. Despite limitations, Covax is a gateway for global distribution that is opening the door for more equitable allocations to countries with less access. Lastly, governments and vaccine companies must build public trust. This means being transparent with the non-scientific community and the general public, releasing adequate information, and building confidence in the private sector.

Significance

Amid a pandemic as devastating as this, it is important to work together on a global scale to combat the virus and to protect as many people as possible, and not just in well-to-do countries, but in poorer countries as well. Although the world has come a long way since the beginning of the pandemic in terms of vaccines and solutions to the pandemic, there is still a lot of work to be done to ensure global health, justice, and immunity from the virus.

Vaccine companies have never produced or innovated vaccines as quickly as they have during the 2020 pandemic. This new speed of vaccine production is promising for the future of drug and vaccine development because from this past year, collaboration and sharing of resources have resulted in greater efficiency, which will undoubtedly benefit future drug development. While it will be future generations that are responsible for dealing with the aftermath of the pandemic, including the burden of debt, there is still much more work to be done as a society to overcome this pandemic and its lingering effects. However, if governments come together as a global society, the process will become less burdensome and more productive as a means of promoting global public health.

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Interplay Between Nationalist Weaknesses and Communist Strengths in the Outcome of the Second Stage of the Chinese Civil War (1946–1949)

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ABSTRACT

A year after the sudden ending of the Sino-Japanese War (1937-1945), the second stage of the Chinese Civil War began and ended in 1949 with the victory of the Chinese Communist Party (CCP). There is heated debate on the cause of the Nationalists' defeat: Was it the CCP's strengths or the Guomindang (GMD)'s weaknesses? The outcome of the war was ultimately an interplay between the GMD's weaknesses and the CCP's strengths. The GMD made serious tactical errors in areas where the CCP was strong, which exacerbated the GMD's deficiencies, and bolstered the CCP's status as a viable alternative. In terms of both popular support and military successes, the GMD fell short, which was in stark contrast to the CCP's immense gains. This essay demonstrates how, first of all, the Nationalists lost the support of key social groups while the Communists won their support through the attraction of their ideology and the promise of socio-economic reforms. Second, the GMD made errors that deeply weakened their military strategy while the CCP embraced mobile warfare. In the end, the GMD's failures were not enough to lead to their defeat, nor did the CCP's strengths alone cause their success.

Keywords: China; Chinese History; Chinese Revolution; Communist Revolution; Chinese Civil War; Chinese Communist Party; Guomindang

Introduction

The Chinese Civil War was fought between the ruling Nationalist Guomindang Party (GMD) and the revolutionary Chinese Communist Party (CCP). The war was divided into two stages. Following the White Terror and fall of the First United Front in 1927, the first stage spanned from 1927 to late 1936. The war was interrupted in 1936-1946 by the Second United Front, an alliance between the two parties in an effort to resist the Japanese occupation of China. After the end of World War II and the surrender of Japan, several foreign countries, such as the United States, attempted to broker ceasefires between the GMD and the CCP. However, eventually, hostilities broke out, and the second stage of the internal war, which was arguably more decisive and is the center of this essay, commenced in 1946 and ended with the Communists' victory in 1949 (Fitzgerald, 1971). This essay posits that the debate on the cause of the Nationalists' defeat can be settled when considering the close interplay between the Nationalists' mistakes and the Communists' strengths. One may argue that it was the Nationalists' war to lose as the ruling party or that the Sino-Japanese War made it impossible for the GMD to recover, and others may claim the CCP's rapid growth in popularity was inevitable due to the social, political, and economic factors that made the Communists' ideology so appealing to the masses. However, it would be a stretch to assert that the CCP would have risen to power without the GMD's mistakes: only truly deep discontent could affect such massive changes. At the same time, if the CCP was not as strong as it was, the Civil War would have ended differently. This essay will first explore the interplay between the GMD's loss of popular support and the CCP's gain thereof, followed by an analysis of the relationship between the GMD's weaknesses and the CCP's strengths on the battlefield. The essay will conclude by addressing the counterarguments to the thesis.

Defining 'Defeat' in the Chinese Civil War

The criteria for determining the Civil War's outcome are two-fold: one, either party's ability to retain or earn popular support, and two, military successes against one another.

This analysis explores popular support among key social groups: the middle class, intellectuals, and peasants. One may argue that the war can only be judged through military factors, and scholars in the West post-1949 contested the role of popular support in contributing to the outcome of the struggle. However, as historian James Sheridan (1975) posits, the desire of Americans to assess the war simply in military terms seems to be rooted in the context of the Cold War; many refused to acknowledge that a Communist party could have genuine popular support. First of all, given the conditions that existed in China during the civil war, the question of military victory and popular support are not separate issues, but two aspects of the same phenomenon. As demonstrated in this essay, the Communists' ability to garner support from the public, and in particular the peasants, lent immense strength to their military abilities given the People's Liberation Army (PLA)'s use of "People's Warfare", or guerilla warfare, which depended on cooperation from locals. Secondly, popular support was a key factor in the GMD's defeat as the Nationalists had proclaimed to adopt a democratic form of government under Sun Yat-sen's Three Principles, the second of which outlined that "China must be made a republic" (Gregor, 1981). The erosion of popular support thus undermined their legitimacy as a governing body, giving full reign to the Communists. Furthermore, following the Western idea of "Consent of the Governed", which states that a government "deriv[es] their just powers from the consent of the governed", the Nationalists no longer maintained the power to justifiably act upon the people (West, 2017).

Military successes, which are not contested as viable factors to assess the Civil War, are analyzed through military strategy, the competence of generals, and the morale of troops. Thus, the Nationalists' defeat in the Civil War resulted from their loss of popular support and military blunders, which contrasted simultaneously with the CCP's surge in popularity and decisive attacks. Historian James Sheridan (1975) shares this position, observing: "The Civil War can be described as the erosion of government strength, and the concurrent expansion of Communist power."

Interplay between the GMD's Loss of Popular Support and the CCP's Gain

The GMD's Loss of Popular Support from the Middle Class

A key effect of the GMD's economic mismanagement, in comparison to the CCP's capacity to maintain economic stability, was the rapid loss of support from the middle class. Hyper-inflation accelerated during the Second Stage of the Civil War, and a key cause was that Chiang Kai Shek, the leader of the Guomindang, failed to develop revenues sufficient to meet wartime needs as he expected a quick victory against the CCP. Therefore, this mistake meant the government was forced to resort to inflationary measures as a means of paying for the war (Bianco & Bell, 1971, p. 194). Furthermore, the GMD failed to institute effective exchange controls until 1948, and in the fall, 1 dollar in the US was worth approximately 12 million *fapi,* the legal currency of Nationalist China. In a drastic move, the government replaced the fapi, the legal Nationalist currency, with a gold yuan note. However, in November, the central bank began to sell gold again; a month later, the yuan collapsed (Campbell & Tullock, 1954, p. 8). The consequence of the inflation was large-scale income redistribution, which had adverse political effects on the GMD. The urban middle class suffered the most from the price hike and the devastating blow dealt to government officials made corruption prevalent (Hu, 1971, p. 3). These issues quickly eroded any remaining popular support as the public grew mistrustful of the government and became disgusted at the corruption. Weary cynicism pervaded public attitudes toward the GMD with the CCP finding favor with the middle class (Sheridan, 1975, p. 278). The communists had demonstrated their ability to ensure economic order on a regional level through their policies in line with Communist ideology in the Yenan Soviet and liberated areas during the Sino-Japanese War. This suggested they could deliver on the national level.

The GMD's Loss of Popular Support from Intellectuals

Beyond the middle class, intellectuals had begun to doubt the GMD's leadership in comparison to the CCP as well. Intellectuals had been fiercely anti-imperialist since at least the 1919 May Fourth Movement and fixed their disdain on the GMD's strong public reliance on the US, which subtly linked the GMD with imperialism in general (Shuja, 1976, p. 6). The CCP painted Chiang as against Chinese nationalism and capitulating to imperialist powers through the use of propaganda, building on the propaganda from the Sino-Japanese War that showed Chiang as reluctant to fight the Japanese. The CCP supplanted the Japanese in the popular mind with the American imperialist, whose evil nature Communist soldiers could verify by inspecting "made in USA" on captured GMD weapons. If the phrase was missing, commanders often inscribed it themselves before distributing weapons (Bianco & Bell, 1971, p. 186). Furthermore, the CCP effectively used ideology as they were the most uncompromisingly anti-imperialist party in the country. They viewed imperialism as a product of capitalism and used force to demonstrate this to the public. In Spring 1949, Communist troops clashed with a British naval frigate, resulting in many dead and severe damage to the ship (Ibid, p. 143). This made Chinese intellectuals see in action the kind of resolve toward imperialist powers that the GMD lacked. Moreover, many intellectuals accepted the idea that China could never be a world power until its peasants were brought out of oppression. While this view did not produce much practical action in the countryside on the part of the majority of intellectuals, the GMD's mismanagement and ensuing exacerbation of the situation was starkly compared to CCP's humane policies towards peasants (Westad, 2003, p. 351).

Whereas Communism had various appeals to Chinese intellectuals, the GMD seemed to only offer a step backward for society. The GMD's most appealing aspects, supposed commitment to democracy and Westernization, were so flagrantly violated that they had little positive effect on intellectuals. In practice, the GMD ignored the most progressive parts of its ideology, and instead, authorities and officials regularly abused their power, ultimately failing to inspire the masses (Sheridan, 1975, p. 23). The CCP was strengthened by this influx of support from intellectuals as they often aided in the organization of peasant masses.

The GMD's Loss of Popular Support from Peasants

One of the main social groups that the GMD failed to gain support from was the peasants. Social context is key here as, even as the responsible ruling

party, the GMD failed to address the dire conditions facing the peasants caused by unequal land distribution, taxes, rent, and oppression by landowners, not to mention several years of military occupation and destruction. The conditions that prevailed in China had left nearly half a billion people in dire poverty and vulnerable to abuse and early death. However, there is a debate on whether such suffering was caused by objective factors, such as lack of available wealth to distribute or the Nationalist government actively contributed to the peasants' living conditions. Historian Lucien Bianco (1971) traces the cause of this failure to Chiang himself and his personal predilections, asserting that it would have been relatively easy to redistribute land through reforms. However, Chiang was initially only interested in peasant reform to weaken the communist support base, but later shortsightedly assumed that military means would suffice to defeat the CCP. In 1935-36, only 3.7% of the national budget was allocated to rural reconstruction (Bianco & Bell, 1971, p. 110). This perspective suggests a greater significance of the GMD's mistakes.

Furthermore, the Nationalists routinely used force on the peasants, exclusively subjecting them to conscription. To the peasants, the Nationalist military was the "quintessence of evil". Beyond this context, the GMD's failure to address these conditions even after 1945 cost them immense popular support (Lynch, 2016, p. 86). In 1945, some peasants merely wished to avoid conflict, whether under the helm of the CCP or the GMD. However, it became clear that the GMD's return meant the undoing of social and political advances the CCP had made in 'liberated areas' which the peasants took for granted. This included the repeal of reforms on interest rates, land tax, and land rent that they had presumed to be part of any postwar government programs (Van De Ven, 2017, p. 111). Thus, this deficiency encouraged continued CCP occupation of their land and doubled the appeal of the Communist's ideology.

The CCP's Gain of Popular Support from Peasants

Accordingly, the CCP's strengths gained them peasant support, most likely their most significant source of popular support. For one, as demonstrated above, after 1945, the CCP's legitimacy and authority were perpetuated because of the lasting impression its policies and ensuing improvements left on peasants.

To the peasants in those regions, the Communist administration during the Sino-Japanese war was the best government system they had known (Fitzgerald, 1971, p. 334). The Communists continued the practices during the Civil War that had earlier commanded popular approval, such as the use of propaganda. Mao and the leadership were keen on contrasting the 'evil' of the government with the humane approach of the Red Army/PLA. For example, soldiers did not abuse civilians; they paid for what they used; troops helped the peasantry when the opportunity or need arose. The Eighth Route Army's behavior toward the peasants contradicted their entire previous experience of the military (Lynch, 2016, p. 90). The key effect of this modus operandi was that it facilitated the spread of ideology as wherever Communists acquired territorial power, they were able to institute a series of political and economic reforms along their doctrine, which also benefited the peasants.

Meanwhile, the CCP applied its goal of a comprehensive social revolution and enacted increasingly radical agrarian policies in the Communist base areas throughout the second stage of the Civil War, thoroughly addressing the mistakes of the GMD. In 1946, the Communist Party approved seizures by local authorities to return landlords' holdings to the poor peasants in some communities. The CCP leadership built on this momentum, and on October 10, 1947, Mao promulgated The Outline Land Law that abolished the land ownership rights of all landlords and authorized peasant associations to distribute land equally among all residents (Kuo-chün, 1951, p. 4). Also, the law canceled all debts incurred in the countryside. A key effect was that in the winter, while some rich peasants rallied to the side of government troops, tenant farmers, small proprietors, and farmworkers who made up the majority flocked to the Communists (Bianco & Bell, 1971, p. 255). Mao also used force in enacting Speak Bitterness sessions in the liberated areas. Such mass political participation was a method of propaganda with the effect of indoctrinating peasants in Communist values and commanding the enthusiasm of peasants as the CCP fully addressed the oppression they faced during the Nanjing decade, a term coined by Sheridan referring to the GMD's rule from 1927 to 1937.

Furthermore, given the pre-existing conditions in China and the nature of the PLA, the question of popular support and military victories are two sides of the same coin. Thus, the CCP's popular peasant support

led to the CCP's military strength of guerilla warfare. The PLA successfully developed links of intimate trust with the peasantry to operate the guerillas (Ibid, 203). As Mao said, no matter how much the GMD studied the Communists' combat techniques, the former could never hope to apply them successfully because it was incapable of winning the unwavering popular support that the latter commanded (Ibid, 186). The peasants also provided the food, intelligence, and various forms of help needed in guerrilla warfare. The enlistment rate closely reflected the progress of the agrarian reforms, such as in Manchuria, where the distribution of land was carried out most thoroughly, providing the PLA with 1.6 million recruits between June 1946 and June 1948 (Fairbank, 1986, p. 112).

Interplay between the GMD's Military Weaknesses and the CCP's Strengths

Military Strategy and Traditional vs. Guerilla Warfare

According to Sheridan, similar to popular support, the CCP had strengths in the exact areas where the GMD exhibited weaknesses, demonstrating the interplay between the two factors. For one, the GMD's traditional, prestigious battle strategy was severely damaging to the Nationalists, particularly in comparison to the CCP's fast, mobile warfare. Chiang and ineffective leaders played a significant role in misguiding its army (Westad, 2003, p. 102). Chiang's strategy envisaged the seizure and retention of cities, even where Communist control of the surrounding countryside left his troops dependent upon airlifted supplies. On occasion, Chiang tried to direct distant battles by telegraph. Chiang desperately attempted to modernize his army but maintained traditional warfare with marches and countermarches. On the other hand, Mao carefully dealt with military realities and gave no weight to considerations of prestige. He developed a clear strategy that put into effect swift attacks aimed at the destruction of GMD armies rather than the seizure of territory (Bianco & Bell, 1971, p. 190). In fact, Mao's army struck mortal blows against the central armies led by Chiang. The interplay between the strengths and weaknesses of military strategies is best exemplified by the 3 campaigns, Liaoshen, Huaihai, Pingjin from 1948-

49 (Li, 2012, p. 387). Chiang miscalculated, straining government finances and losing hundreds of thousands of troops by concentrating on Manchuria when he should have been defending the area south of the Great Wall. Moreover, the PLA's ability to adapt its warfare to both conventional (great battles and city sieges) and guerilla approaches led them to successfully attack the GMD troops while conducting massive infiltration of the countryside, facilitated by their peasant popular support (Ibid, p. 391).

Competence of Military Generals and Commanders

Furthermore, the GMD generals were commonly chosen on grounds of political loyalty to Chiang, which led to incompetent military commanders, demonstrating the role of Chiang's pride and suspiciousness. Chaing repeatedly recalled and replaced commanders, resulting in a discontinuity in leadership that crippled any possible Nationalist initiative (Fairbank, 1986, p. 124). Not only incompetence but corruption was rampant among the GMD generals, who stole and sold government property, sometimes to the Communists. However, Communist field commanders were selected on merit, and given wide latitude to use their own judgment. They ran generally aggressive, sometimes brilliant campaigns. Communist armies were marked by a continuity of command. The same generals, Chu Teh, Peng The-Huai, Lin Piao, Chen I, and Liu Po-cheng had remained in command not only throughout the Civil War but since the Long March (Bianco & Bell, 1971, p. 192).

Morale of Troops

With such dysfunctional leadership, morale in the government armies was understandably at rock bottom. This was exacerbated by the deplorable conditions pervading the army after the Sino-Japanese War. Desertion and defection of entire units were common as soldiers were inadequately paid and fed; training was poor to nonexistent; discipline was bad; men did not know what they were fighting for, and thus saw no reason to fight (Hsü, 1970, p. 288). To prevent desertion, the government went on the defensive to limit troop interaction with the Communist side. Conversely, the CCP soldiers were well cared for, well trained, and thoroughly indoctrinated about the need and purpose of the struggle (Ibid, 301). The intelligent Communist strategy of fighting only when success seemed assured

cultivated a feeling of victory and stimulated a spirit of boldness that contrasted vividly with the defensive mentality of the GMD (Van De Ven, 2017, p. 86). Communists encouraged defections by indoctrinating captured troops and then allowing them to return to their units if they wished. While the GMD defectors at first might not have known what they were fighting for, they knew that their Communist counterparts were not mistreated (Ibid, p. 87).

Alternative Revolutionary Parties

Others may argue that the cause of the GMD's defeat lies entirely with the weaknesses of the Nationalists and that the Chinese Communists simply stepped into a vacuum as "any organization could have seized power in 1949". One may present the CCP as the only alternative due to their experience with regional governance, specifically in the Yenan Soviet, while simultaneously recognizing the active failures on part of the GMD after the Sino-Japanese War. However, Sheridan (1975) disagrees and points to Chinese liberals as a potential leading party as well. In 1944, China's Democratic League was created, which was the most organized political movement of Chinese liberalism, and it tried vigorously to become a third force in Chinese politics after the Japanese surrender. Even General George Marshall, who was sent by U.S. President Harry Truman to negotiate a ceasefire between the Nationalists and Communists, said that the "salvation of the situation … would be the assumption of leadership by the liberals in the Government and in the minority parties, a splendid group of men…." (U.S. Department of State, p. 688). However, Chinese liberalism was much too weak for the task. In the end, no other party was strong enough to contribute to the demise of the GMD as the CCP was (Sheridan, 1975, p. 280). This was largely due to the CCP's experience in regional governance and because the social-economic conditions perpetuated by the GMD were innately addressed by communist ideology. Only because CCP strengths directly addressed the weaknesses of the GMD was a revolutionary party able to succeed.

Role of the Sino-Japanese War (1937-1945)

Arguing for a 'conditions' based perspective,

the historian Immanuel Hsu (1970) attributes the GMD's defeat to the impact of the Sino-Japanese War: "The single most important near cause for the downfall of the Nationalists was the eight-year Japanese war" (Hsü, 1970, p. 213). Hsu argues that while the Nationalist Army was a tired and weary force, the Communists did not bear the brunt of the fighting. While it is true that the GMD was involved in the majority of the conflict, based on the relative size of the opposing armies (the Communist troops were outnumbered four to one), and the arms and equipment at their disposal, the CCP still seemed destined for quick defeat (Sheridan, 1975, p. 67). To account for the GMD's initial successes, Hsu argues that its "credible performance before 1948 represented a last desperate thrust before the final collapse" (Hsu, 1970, p. 98). However, this argument is simplistic as Communist victories at the turning point of the war, such as in the Huaihai Campaign, were not caused because the GMD suddenly "tired" out. Rather, the CCP had adapted to conventional warfare and Chiang had made poor military decisions. Furthermore, even the heightened nationalism of the immediate postwar period served as an advantage as public opinion credited the advances China had made with the government to which people naturally looked for leadership in consolidating these gains. Chiang's prestige was at its "zenith" after 1945, argues Bianco (1971).

Conclusion

The Chinese Civil War concluded with the Communists' victory in 1949. Chiang left mainland China shortly after with hundreds of thousands of GMD soldiers to establish the Republic of China in Taiwan. In terms of analyzing the cause of the outcome, the GMD's failures were not enough to lead to their defeat, nor did the CCP's strengths alone cause their success. Both contributed to some extent as there was significant interplay between them. For one, the CCP's gain of popular support directly addressed the mistakes of the GMD in its treatment of the middle class, intellectuals, and peasants. Similarly, the GMD's military weaknesses fell short in the areas where the CCP was notably strong: military strategy, the competence of commanders, and morale of troops. While the GMD did allow themselves to be defeated, the CCP's strengths were crucial as no other group could have brought about the GMD's demise as quickly if at all.

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Ideological Symphonies:
Beethoven and the French Revolution

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ABSTRACT

The development of western art music from the Classical era to the Romantic era is often treated as a narrative separate from its contemporary political history, despite the importance of the historical backdrop against which this shift began – the French Revolution and the Napoleonic Wars. It was during this period, characterized by the rise of individualism and resistance against Europe's absolutist monarchies, that the musical giant Ludwig van Beethoven (1770-1827) produced some of his most important works. While not all of Beethoven's works had explicit political connections, over time, there were stylistic developments within his pieces that captured the political progressiveness of the historical period. This research paper uses a range of primary and secondary sources, as well as music score evidence, to compare stylistic choices and developments over time in Beethoven's music with the political and ideological narrative of the French Revolution, from reformist reticence to unreserved revolutionary violence. Additionally, it argues that starting from the Third Symphony, the structure of each symphony reflects the Jacobin revolutionary ideal, from violence and terror to the ultimate utopian victory. The paper concludes that while it remains unclear whether Beethoven intended the political connotation in his works, his progressive compositions present a parallel narrative to that of the French Revolution, and the stylistic developments echoing the revolutionary vigor, radicalism, and violence across his symphonies served as a means of radicalizing the public and glorifying the ideals of the French Revolution.

Keywords: French Revolution, classical music, romantic era, Beethoven, symphonies, Robespierre, Napoleon

Introduction

It is often difficult to associate classical music with politics. In fact, the exclusive, niche nature of classical music renders it difficult for one to associate it with any other specific field of study; however, with closer examination, one can find deep political connotations carefully woven between the notes and staffs in musical masterpieces. Ludwig van Beethoven (1770-1827) is considered one of the greatest musical giants of all time, often deemed as the composer who advanced the world of classical music into the deeply expressive Romantic period at the beginning of the nineteenth century. The majestic grandiosity, idiosyncratic harmonic language, and sheer scale of Beethoven's works were absolute breakthroughs from previous conventions of classical music, and many of his works remain the most celebrated and acclaimed in today's classical music repertoire (Botstein, 2010, p. 361). Beethoven's music is often absolute, meaning that instead of being about specific, concrete concepts, the compositions represented subtler emotions and more abstract ideas via the music itself (Pederson, 2009, p. 242). This lack of programmatic content is among the reasons why political messages and implications within Beethoven's music are sometimes ignored.

The start of the development of western art music from the Classical to Romantic periods occurred concurrently with a historical period of extreme significance – the French Revolution and the Napoleonic Wars (1789-1815). Over these years, characterized by resistance against the absolutist monarchies of Europe and the rise of individualism, Beethoven produced some of his most important works. This brings the discussion to the research question of "to what extent did stylistic features of Beethoven's symphonies reflect the ideological development of the French Revolution?" Indeed, Beethoven himself worked in Vienna, instead of the period's center of revolutionary change that was France, and his personal battle against the crisis of growing deafness cannot be ignored when examining reasons for his change in musical style. However, while not all of Beethoven's music had explicitly political connections, there certainly were stylistic developments within it that capture the overall political progressiveness and radicalism of the period. Beethoven's true intentions remain unclear, but it

can be argued that his progressive compositions possessed characteristics similar to the vigor, radicalism, and violence of the revolutionary ideals at the end of the eighteenth century; therefore, the stylistic developments across and within Beethoven's symphonies mirror the ideological developments of the French Revolution and served a means of indirectly revolutionizing the public and glorifying the ideals of the French Revolution. This paper will examine Beethoven's symphonies Nos. 1, 2, 3, 5, 6, and 9 one by one, and situate them in conversation with the history of the French Revolution.

Under the Seeming Apoliticism

The majority of Beethoven's works were produced between 1795 and 1815. In European music circles during this time, the idea emerged that music, by itself, can communicate its own innate ideas and emotions without composers having to explicitly link it to more concrete concepts (Johnson, 1991, p. 32). As a leading composer of his time, Beethoven's music was indeed more emotionally rich, nuanced, and complex than the compositions of the greats before him, Joseph Haydn (1793-1809) and Wolfgang Amadeus Mozart (1756-1791). More importantly, the absolute nature of his music prompted audiences to not always consider his works in connection with contemporary societal events and politics, a view that has been acknowledged by scholars such as Leon Botstein (2010). Compared with later composers of the Romantic Period, Beethoven's music was significantly less programmatic, and for him, "sentiment and feeling, not depiction, were proper objects of communication through music" (p. 362). Amidst these deeply personal expressions of emotion, it is hard to imagine that there are any political connotations; however, with closer examination, it can be argued that there are subtle political undertones (notably the aftershocks of the French Revolution) present in his music, though not in an overtly explicit manner. As scholar Owen Jander argues, in the music of Beethoven, there are "structures… employed in composing but wished to remain hidden" (p. 362). Historian Jan La Rue argues that since around 1815, it has been historically established "with the support of long tradition" that Beethoven's form of supreme

musical accomplishment was the symphony (La Rue, 2001, p. 221), and not unlike the development of the French Revolution, Beethoven's symphonies, all written after the revolution, did develop an intense, glorifying, and almost violent character over time, filled with sudden changes that echo the narrative of the revolution. From a purely musical standpoint (even when disregarding Beethoven's contemporary politics), Beethoven's compositional scale, harmonic language, and emotional input were revolutionary in every way. While Symphonies Nos. 1 and 2 started with a comparably more conservative style, starting from the Third, titled the *Eroica*, abrupt twists that mirror the revolution's progression, as well as the Jacobin belief and narrative of terror followed by glorious victory, became gradually more apparent in the structures of Beethoven's symphonies. These contrasting characters are represented by contrasting movements, connecting the entire symphony as one continuous work of revolutionary narrative. This is especially apparent in the explicitly political No. 3, the devastating No. 5 that eventually reaches its heroic conclusion, the transition from the storm to peace in No. 6, and finally, the transformation from the first and second movement's terror to the finale's utopian explosion of joy in No. 9. In these structural, stylistic manipulations, Beethoven was able to revolutionize and almost terrorize his audiences with novel, revolutionary ideas and values in a musical version of the terrors the French revolutionaries inflicted upon their people.

Early Period: Early Hints of Revolution and Radicalism

Beethoven's earlier works, including his first two symphonies, consisted of compositional features that did indeed have a more conservative character; however, these features appealing to aristocratic aesthetics were mixed with hints of a more heroic style, mirroring the political and ideological uncertainty Europe faced during the early years of the French Revolution. While the narratives of Beethoven's stylistic change and the Revolution were not chronologically linear, their developments do follow a similar progression. Beethoven's budding heroism and idiosyncratic style lurking under the classical façade undoubtedly echo the initial compromise attempted between the revolutionaries

and royalists of the French Revolution – the idea of Constitutional Monarchy.

i. 1789-1791: Conservative Beginnings of the French Revolution

Though the French Revolution is often remembered as a period of great radical change, its initial stages were characterized by some rather conservative political views among the revolutionaries. During the famous Tennis Court Oath (1789), the purpose of the National Assembly was actually deemed as "to establish the constitution of the realm, to bring about the regeneration of public order, and to maintain the true principles of monarchy" (Mason & Rizzo, 1999, p. 60-61). At this point, the revolution was not aiming to completely overthrow the old order, and the image of the monarchical regime hadn't been reduced completely to one of despotism and tyranny. It is clear in the Oath that the revolutionaries merely aimed to ameliorate and preserve the explicitly mentioned monarchy. However, more aggressive views, although not prevalent at the time, certainly existed – as the Abbé Emmanuel Joseph Sièyes remarked: "The pretended utility of a privileged order for the public service is nothing more than a chimera; that with it all that which is burdensome in this service is performed by the Third Estate" (Sièyes, 1789). The privileged estates, consisting of the clergy and nobles, were viewed as inutile parts of society, and this notion lurking beneath the surface of political compromise eventually built up to the political radicalism and utter bloodshed that became the infamous Reign of Terror (1793). With the fiery crowds, riots, and radical journalism of France, especially Paris, the French public was easily steered into radicalistic political mindsets. Some people, however, particularly foreign spectators of the revolution, were not readily accepting these changes. As Irish statesman Edmund Burke (1729-1797) remarked in his *Reflections on Revolution in France*, the revolutionaries "had all these advantages in your ancient states, but… chose to act as if [they] had never been molded into civil society and… began by despising everything that belonged to [them]" (Burke, 1790). Radical changes against the established order were seen almost as an act of barbarism. One could argue that this was not unlike opinions in the European music scene a few years later, in more indirect and subtle ways.

ii. Symphony No. 1 in C Major

Beethoven's Symphonies No. 1 and 2, written between 1801 and 1802, are generally considered as Beethoven's most conservative symphonies that appeal more to the styles of Haydn (1732-1809) and Mozart (1756-1791), although some subtle Beethovenian characteristics are apparent under the surface (Tovey, 1944, p. 64). In terms of broader characteristics, it is reasonable for one to consider Symphony No. 1 a conformist and unprogressive work of the Classical period. It is written in the key of C major, the most basic key and arguably most common key in music, and thus a key with which audiences were immensely familiar. Additionally, the movements of the symphony follow the common fast-slow-fast-fast structure frequently used in the Classical period: Allegro, Andante, Minuet & Trio, and Allegro, further showing the conservatism of this work. However, under these broader conventional features are some deeply original, innovative techniques presaging Beethoven's instantly recognizable style in his later works. A notable example is the frequent use of *sforzandi* (sf), which are sudden, accented outbursts of volume or emphasis. These become an extremely prominent feature of Beethoven's later works (Huron, 1990), often marking instances of harmonic dissonance or conflict.

Here, they are placed amidst the conventional, consonant harmonies, suggesting a sense of turbulence and tension beneath the conservative surface, not unlike the lurking radicalism behind the French Revolution's initial pursuit of a mere political reform. The reception of this music also mirrors the foreign social response to radical ideals of the French Revolution. Politicians like Burke viewed the French Revolution's disdain and resistance against the old, established order as utterly unacceptable, and the reception to Beethoven's innovative attempts in Symphony No. 1 was no different: "Beethoven's first symphony premiered in Paris in 1807 and was unanimously recognized as a ponderous flop… he prepared his public for soothing cadences only to shock them with monstrous surprises" (Johnson, 1991, p. 24). Similarly, Beethoven's Symphony No. 2 in D Major, finished only a year later, presents similar elements of innovation and turbulence. This is done once again under a mostly unprogressive surface, although progressive characteristics start emerging more conspicuously.

iii. Symphony 2 in D Major

While Symphony No. 1 was a modest exploration of a bolder compositional style under the heavy influence of Haydn and Mozart, Symphony No. 2 marked the emergence of a more noticeable style, with an utterly Beethovenian opening foreshadowing his later works.

Sforzandi are present again, and this time, instead of falling on the conventionally stronger beats, which are the first beats of each bar, they fall on weaker beats, or even between beats, to further create a sense of turbulence. Another defining characteristic of Beethoven's music is present in this introduction – sustained, grand opening chords played by the full symphony in an extremely loud volume, or fortissimo (ff). These chords appear twice in the opening, with the short-long rhythm giving them a unique sense of Beethovenian grandeur. Structurally, Symphony No. 2 marks the true emergence of Beethoven's idiosyncratic heroic style, with the replacement of the Minuet & Trio by the Scherzo as the third movement. The Scherzo follows the same form as a Minuet & Trio, but as opposed to the stately, reserved Minuet & Trio, it has a much more energetic, intense, and sometimes even violent character. Considering all these subtle but significant stylistic features, the first two symphonies of Beethoven are quite representative of Beethoven's early period. In other words, they conform to the classical norms with hints of an underlying independent style, which mirrors the clashing of ideologies during the early stages of the French Revolution – between radical revolutionaries and conservative reformists.

Middle Period: Sublime Terror Comes Before Utopian Victory

In 1793, with the start of the Reign of Terror, the narrative of the French Revolution turned into one of abrupt twists and violent developments fueled by the people's growing political radicalism. Similarly, in Beethoven's subsequent compositions, he adopted a more vigorous and intense style, with more sudden changes and dramatic contrasts. Two of Beethoven's most prominent compositions in this developed style are Symphony No. 3 in E-flat Major, the *Eroica* (Heroic), and Symphony No. 5 in C Minor.

i. 1793: The Reign of Terror

Under the growing Jacobin radicalism among the French people, the old regime became a symbol of pure evil, and monarchist elements no longer seemed viable as a part of the new government order. With Louis XVI's unsuccessful attempt of fleeing Paris in 1791 to instigate a counterrevolution (the Flight to Varennes), the monarchy became a representation of outright despotism and tyranny that did not care for the interests of the ordinary French people. With the execution of Louis XVI in 1793, France sank into complete revolutionary chaos. The rise of the Committee of Public Safety (1793-1795), a provisional governing body during the revolution, and its leader Maximilien Robespierre (1758-1794) marked the start of a period of mass denunciation, execution, and extreme political violence driven by revolutionary utopianism. This was under the belief that only violence in the name of virtue and revolution could cleanse France of her despotism and injustice (Elshtain, 1989, p. 210). This was the Reign of Terror, justified by Robespierre as "liberty's despotism against tyranny" (Robespierre). The people's radicalism, as well as the revolution itself, became deeply violent and capricious, with the revolutionary leaders eventually turning against each other. The label of the counterrevolutionary emerged, a term used by Committee of Public Safety leaders to label all who opposed their extremist ideals, the "assassins" who aim to "dishonor the people's cause, to kill public virtue, to stir up the fire of civil discord, and to prepare political counterrevolution by moral counterrevolution" (Robespierre). Eventually, other revolutionary leaders Georges Danton and Jacques Hébert were sentenced to death by guillotine by

Robespierre, who was also executed months later. In this period of extreme political turmoil and instability, described by Burke as "instructive monuments of rash and ignorant counsel in time of profound peace" (Burke, 1790), the narrative of the revolution turned into a deeply unpredictable one, full of sudden twists. This is a characteristic that Beethoven's symphonies curiously start adopting, starting with the *Eroica*, completed in 1804.

ii. Symphony 3 in E-Flat Major, *Eroica*

The *Eroica* is often considered Beethoven's entrance into writing deeply expressive Romantic music, and sometimes even the first work of the Romantic Era that drove the entire western musical world into Romanticism (Hamilton-Paterson, 2017), due to its sheer scale, emotional intensity, and rich political connotation. Again with two emphatic, full symphonic chords, the Eroica grandly opens its majestic first movement, but before the main theme is even elaborated upon, Beethoven interrupts the consonant, flowing melody with striking chromaticism, an intrusive C-sharp following the E-flat major opening.

This sudden introduction of dissonance is only one of the many sudden twists in mood that the colossal *Eroica* undergoes over the course of its four movements. Although the general structure and order of the *Eroica's* movements remain unchanged, the mood changes only continue Beethoven's journey of pushing the boundaries of the classical symphony. Amidst the triumphant first, third, and final movements, Beethoven writes a vast, devastating Funeral March, "sorrowful in its sense of inevitable fall from all melodic tones on which it pauses" (Holden, 1962, p. 636), almost completely offsetting the glorious heroism. In addition to this bold juxtaposition of moods, the *Eroica* is only more intriguing when one considers the political context concurrent to its composition. After the French Revolution, Napoleon Bonaparte (1769-1821) finally brought a measure of peace and stability to France, but after just a few more years, he proclaimed himself Emperor, regressing to absolutism. Indeed, Beethoven originally wrote the Eroica for Napoleon for being the heroic savior of Europe (Steblin, 2006, p. 63), but

consequently, with Napoleon's rise to absolutism (by crowning himself First Consul for life in 1803),

Beethoven shifted the tone of the *Eroica* abruptly from a celebration of Napoleon to an outcry against him. Compared with previous compositions by both Beethoven and other composers, the *Eroica* is utterly revolutionary, including not only directly political content, but almost an explicit political narrative within itself. Like the political instability of the Terror, the mood only continues to change after the Funeral March, as Beethoven returns to the triumphant mood in his third and final movements. The third movement is now a fully developed Scherzo, breaking away entirely from the reserved Minuet and Trio of the Classical period. The finale is once again filled with twists. Instead of having a grand opening in E-flat major, it opens with a dark, stormy passage in G minor, and then settles into E-flat major. The theme is then properly introduced, before going through a diverse variety of transformations in harmony, rhythm, and style, echoing the ever-changing, unpredictable narrative of the Terror.

iii. Symphony No. 5 in C Minor

Symphony No. 5 in C Minor, arguably the most recognizable work in western music, is characterized by its bold character and unmistakable, universally celebrated opening theme.

This motif immediately establishes a dark, unyielding, yet majestic character that sustains itself throughout the first movement. *Sforzandi* are once again present, and occasional transitions into more peaceful moods are uncompromisingly interrupted by the dark character of the opening, distinguished by its violent use of loud dynamics and turbulent, diminished harmonies.

This tumultuous, fierce character captures the brutal, capricious intensity of the revolution even more explicitly than the *Eroica* does, and as historian Rhys Jones states: "Beethoven's music… sounded like the Revolution itself" (Jones, 2014, p. 954). Symphony No. 5, though still classical in structure, has advanced into Beethoven's deeply unique compositional style, almost entirely different from any preceding musical work, that fills the music with energetic and sometimes restless excitement, dramatic shifts, and a hint of violence driving it forward.

Aftershocks of the Revolution: Legacy of the Jacobins

Even after the Reign of Terror had properly died down, the legacy of Jacobin ideals and utopianism remained in political thought (Furet, 1989, p. 267)

and Beethoven's symphonies. The symphonies after the *Eroica* almost all become characterized by the common structure of an opening of terror and chaos that gradually builds towards a heroic ending of victory. Beethoven's music started to not only mirror the Jacobin revolutionary ideals, but also force these ideals upon his listeners through the Jacobin-esque revolutionary rhetoric within his music.

i. The Jacobin Rhetoric: From Terror to Utopia

One of the primary factors that rendered the Terror's scale and intensity possible was the powerful, stimulating rhetoric of the Jacobins. While revolutionary spirits prevailed among the Jacobins and their supporters, to the rest of France and Europe at the time, the radicalism of the French Revolution was deeply disturbing and posed a serious threat to European political stability and the established monarchist regimes. As a counteraction against the Prussian, Belgian, and domestic forces that were all attempting to overcome and reverse the revolution, institutions of the Terror were created (Furet, 1989, p. 266). To justify these extreme measures of violence, the Jacobins cited the dichotomy of "virtue, without which terror is fatal; terror, without which virtue is powerless" (Robespierre, 1794). The frequent, constant repetition of abstract, somewhat undefined concepts such as "virtue" was a prominent rhetorical feature used by Robespierre. He argued that, "policy ought to be to lead the people by reason and the people's enemies by terror" (Robespierre), and that this terror was only acceptable since it was carried out in the name of virtue. He further associated virtue with a plethora of concepts appealing to the French people's desire for democracy and freedom, such as "the soul of the Republic," "love of the nation," and "natural to the people" (Robespierre), effectively establishing how terror was a necessity to the revolutionary administration. This rhetoric rich in repetition hammered abstract, revolutionary ideas continuously into the minds of the French people, justifying the political violence. It was believed that only through this sublime terror (Johnson, 1991, p. 952) could the revolution cleanse the evils of the old regime and bring about a glorious utopia. As these ideas grew, the Terror pushed France further into political turmoil. The revolution started embracing extreme degrees of radicalism, and traditional, fundamental components of the old regime, such as Christianity, were simply abandoned and abolished by the revolutionaries for the sake of a complete overthrow of the old order.

ii. The Romantics' Utopia

Comprehensively examining the symphonies of Beethoven starting from the Eroica by viewing the movements as a whole, the narrative of terror growing into glorious, virtuous victory – as well as the Jacobin rhetoric utilized to support this narrative – become apparent within the music. Beethoven's style shifted toward Romanticism in his middle and late periods, with music that "was not mere entertainment, but a moral force capable of creating a vision of higher ideals" (Kamien, 2018, p. 238). Not unlike the revolutionaries, musicians of the Romantic Era also sought to "escape from melancholy in dreams, in endless longing for a utopia glorious future" (Kravitt, 1992, p. 103), and as a pioneering figure of early Romanticism, Beethoven was masterful in incorporating ideas of utopianism, as well as the ideals and rhetoric of the French Revolution into his music. As previously discussed, within separate movements in the *Eroica*, instances of stormy, chaotic passages leading to triumphant grandiosity were already apparent, but the first full emergence of this narrative from the terror to the victory, consolidated by Robespierre-esque rhetoric, was Symphony No. 5.

iii. Symphony 5, Revisited

The violent, uncompromising opening theme of does not only dominate the motivic and rhythmic development in the first movement, but also returns several times in subsequent movements.

From movement 2

From movement 3

From movement 4

This is not unlike Robespierre's rhetorical choice of continuous repeating ideas in speech to strengthen their significance and people's memory of them: "The first four notes of the Fifth achieved their overwhelming effect… that permeates the entire symphony, imbuing it with an obsessive, convulsive, repetitive rhetorical trajectory… a similar propensity towards repetition, rhythm, even incantation in the oratorical techniques of… the National Assembly" (Jones, 2014, p. 966). Indeed, like Robespierre, Beethoven uses the turbulent first movement as the formal, explicit introduction of his motif, or revolutionary ideal, which keeps making indirect, returning appearances in all three later movements, continuously enforcing his ideas upon the audience, or the public.

Viewing the symphony as a whole, the movements aren't only tied together by the motivic connections either – a tonal narrative reflecting revolutionary ideals is also apparent. While the turbulent, chaotic first movement is in the dark key of C minor, the unrushed, delicate second movement transitions into the tranquil, delicate A-flat major, written in a much calmer mood. This can be considered as mirroring the revolutionary narrative by following a passage of chaotic terror with peace and tranquility, virtuously brought to the people after the violence. The third movement returns to C minor, but the character is tersely serious and much less aggressive, perhaps representing the final struggles of the revolution before arriving at the victory of virtue and liberty, and indeed, the ultimate triumph is arrived at in the majestic, unreservedly optimistic finale written in C major. The key is not only the most fundamental and joyous key

there is, but also the parallel major of the preceding key C minor, emphasizing not only the importance and jubilation of the revolutionary victory, but also the fact that terror and triumph, like C minor and C major, are fundamentally connected, and that triumph cannot arrive without the preceding terror. The final movement is characterized by its fanfare-like main theme, driving the music forward in unmistakable, unyielding but victorious Beethovenian fashion.

The quasi-rhetorical use of repetition is again present. Unlike classically accepted traditions, this movement barely modulates, consistently remaining within the tonality of C major to maintain the triumphant, glorious energy established from its very first notes. At the end of the movement, like Robespierre's impassioned cries of determination, the majestic, concluding C major chord is repeated forty times consecutively, as the final, almost forceful consolidations of the revolutionary, violent ideas into the audience. Considering this with the aggressive character of the opening motif, it can indeed be argued that like the speeches and executions of the Terror, Symphony No. 5 is a political means of terrorizing, stimulating, and revolutionizing the public by exposing them to radical ideas and continuously reinforcing them through repetition and rhetoric.

iv. Symphony No. 6 in F Major, Pastoral

The remaining symphonies of Beethoven continue alluding to the ideals and rhetoric of the French Revolution, and their stylistic innovations further progress, reflective of the complete overthrow and abandonment of traditional ideals at the peak of the Terror.
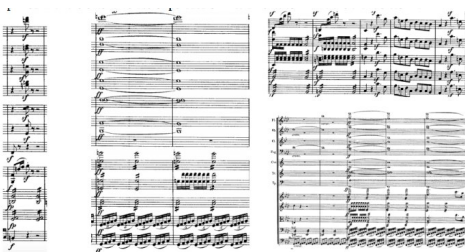
Beethoven's Symphony No. 6 in F Major, titled the *Pastoral*, completed in 1808, was another stylistic breakthrough from the conventions of the Classical Period. The symphony was written with extremely explicit programmatic content, with each movement having a specific title depicting the pastoral, peaceful concepts and images the movement portrays. The programmatic symphony only became a standard form of composition later in the Romantic Era, by later composers such as Hector Berlioz (1803-1869) and Franz Liszt (1811-1886) (Kamien, 2018, p. 262), so Beethoven's Pastoral was yet another complete innovation for his time. Though this programmatic content is, as stated before, not explicitly political, the Jacobin narrative is present nonetheless. The turbulent character of the Terror is in the fourth movement depicting a storm, written in the dark key of F minor. The extreme dynamic of *ff*, clashing, diminished harmonies, and frequent *sforzandi* are once again present in the music, with the violent character even further amplified with the extensive use of percussion instruments to mimic the thunderstorm.

Following this, however, is the peaceful, tranquil last movement depicting people's sentiments of joy and gratitude after the storm, "effortlessly transforming chaos into clarity… As the clouds part, the sense of sublime terror is overcome by a similarly naturalistic musical optimism" (Jones, 2014, p. 968). It is written in F major, once again in the parallel major of the previous movement, signalling the arrival at the glorious future, as well as the fact that it would be impossible without the terror that preceded it.

v. Symphony No. 9 in D Minor, Choral

Lastly, Symphony No. 9 in D Minor, or The Choral, completed in 1824, was Beethoven's final symphony embodying the supreme revolutionary change he had brought to music and reflecting the peak of the French Revolution's ideological overthrow of the old order. Structurally, even the movements no longer follow the classical tradition. The revolutionary, intense Scherzo is now directly after the fast first movement, and then followed by the slow movement and finale, to maximize the terror before the triumph.

Furthermore, as a final breakthrough against the established norms of classical symphonic music, Beethoven included a full choir with extensive parts in the colossal finale of victory. The first and second movements of terror are once again in minor key, both in D minor, and this time, even the Scherzo is given a violent, "diabolical" (Hanoch-Roe, 2002, p. 174) character full of abrupt twists to highlight the sheer intensity of the struggle and terror that revolution has to experience before arriving at the utopian outcome. Expectedly, the finale is once again an utter victory in the parallel major of D major, with the introduction of the full choir only elevating its triumphant mood. At the climatic ending, the familiar revolutionary rhetoric emerges once more, with boisterous final reiterations of the main theme, as well as twenty-eight consecutive repetitions of the concluding triumphant D major chord. In Beethoven's incorporation of sublime aesthetics into his music, he was effectively appealing to the same rhetorical techniques of the revolutionaries during the French Revolution. Beethoven presented the musical version of stimulating, terrorizing, and almost oppressing the public into embracing and accepting new, revolutionary ideas: "Paris had the Terror, Vienna had Beethoven" (Jones, 2014, p. 967).

Conclusion

In essence, closer examination suggests that there does exist a parallel narrative between the developmental patterns of the political ideology of the French Revolution and stylistic features in the symphonies of Beethoven. Though those two developments were not chronologically concurrent, it is apparent that Beethoven's music exhibits features across his nine symphonies reflecting the ideological narrative of the French Revolution, from reticent, reserved reformism to violent radicalism filled with revolutionary changes and sudden twists. Furthermore, while the nine symphonies together capture this broad ideological development, in each symphony starting with No. 5, the structure and stylistic devices actually follow the revolutionary narrative of the journey from sublime terror to glorious victory within the symphony's movements. This is musically enforced in similar ways as the rhetorical devices used by Jacobin revolutionaries, most notably Robespierre. While it remains unclear whether Beethoven intended the heavy political parallels and connotation in his music,

his symphonies were undoubtedly reflective of the deeply progressive, sometimes destructive ideological shifts in France at the end of the eighteenth century and beginning of the nineteenth, and his grandiose music can indeed be unsettlingly interpreted as a means of radicalizing and terrorizing conservative audience during an era of great political change and radicalism.

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