Hospital Operations During the COVID-19 Pandemic

by

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Abstract

Hospital operations is a broad description of a complex field, but its complexity does not diminish its importance. Delivering health to communities is challenging, and even minor hiccups can cause severe ripple effects. In 2020, the globe was faced with an unprecedented public health crisis, which presented an unprecedented disruption to healthcare. Hospitals were quick to respond, but as the crisis in the US has surpassed one year, many hospitals are coming to terms with the unsustainability of interventions that were never intended to be long-term solutions. Healthcare at its core is about people – both patients and staff – but if corrective action is not taken immediately, the long-term impact on the wellbeing of communities has tremendous public health significance. This document sets forth an account of hospital operations throughout the pandemic, highlights the challenges faced by operational leaders, and makes recommendations for policy leaders to address the shortcomings of the current model.

Table of Contents

List of Figures

Preface

I would like to acknowledge my essay advisor, Professor Sam Friede, as well as my essay readers, Mrs. Kitty Zell and Dr. Osea Giuntella, for their dedicated attention and compassionate guidance throughout my essay writing process and educational career. I have learned much from each of them and will take these lessons with me wherever I go. I would also like to thank my friends and classmates in the Department of Health Policy and Management for their unending willingness to support me and one another during the difficult times posed by the COVID-19 pandemic.

1.0 Introduction

It takes a village to run a hospital. In the United States, hospitals are diverse, complex entities tasked with one of the most important roles in society: managing the health of a community. Finding one standard set of operating guidelines that easily applies to all – or even most – hospitals in the US is virtually impossible, which highlights why it is so difficult to understand the complexities of hospital operations at a glance.

Of course, as any biologist would attest, the more complex an organism is, the more opportunities there are for things to go wrong. This concept can be applied to many different types of systems, and healthcare is no exception. Leaving non-hospital entities alone for now, imagine all of the functional areas involved in hospital operations. One's mind likely turns quickly to the clinical staff that perform surgeries, administer medication, and tend to the care needs of healthcare consumers, but there is a network of non-clinical ancillary and support services that is vital to ensuring business runs smoothly in hospitals on a day-to-day basis. In 2020, healthcare was faced with a once-in-a-lifetime disruption to business-as-usual: the COVID-19 pandemic.

Long before 2020, alarm bells have sounded as healthcare costs in this country continue to rise without commensurate increases in the wellbeing of the population. Hospitals and other healthcare stakeholders have been saddled with one over-arching behemoth of a goal: keep doing what you're doing, but do it better and at lower cost. Now, as a novel viral contagion threatens the lives and livelihoods of millions of Americans, that task seems even more daunting. Some of the progress that has been made in the past few years has been upended as consumers attempt to mitigate personal risk and hospitals have been forced to reimagine their workflows. This disruption has also exposed new avenues for progress and kindled hope for a brighter future. One thing is

certain, however: the COVID-19 pandemic has engendered or highlighted immediate needs within the hospital industry that must be addressed in the very near future.

This paper will delve into the world of hospital operations during the greatest public health crisis that this country has faced in a century. In particular, this paper focuses on the flagship hospital of the University of Pittsburgh Medical Center (UPMC) – a large integrated delivery and financing system (IDFS) in Western Pennsylvania – with supporting accounts from other Western PA hospitals. The information presented subsequently is based largely off of UPMC staff interviews. A common theme is apparent throughout this document: the current operating standards in hospitals across the country are not sustainable, even in the short-term. If decisive legislative action is not taken in the first quarter of 2021, some currently worst-case scenarios will become very realistic. To speculate on what those scenarios might be at this time would be counter-productive, but any outcome in this arena would likely have devastating effects on the long-term health and wellbeing of the American populace.

1.1 Background

UPMC operates more than 40 hospitals across Pennsylvania, Maryland, New York, and overseas. Its flagship system, UPMC Presbyterian Shadyside, is located in the heart of Pittsburgh, Allegheny County, Pennsylvania. Presbyterian Shadyside actually consists of multiple hospitals and other clinical buildings distributed across two separate campuses. Together, this flagship hospital network has over 1,200 beds and provides world-class care in nearly every major adult specialty (University of Pittsburgh Medical Center, 2021).

Pittsburgh is the second-most populous city in Pennsylvania behind Philadelphia, and the Pittsburgh metropolitan area is home to over 2 million people. The area's blue-collar background is reflected in a racial makeup that is over 80% white, with less than 40% of the population over age 25 holding at least a bachelor's degree and a median household income of about $50,000 (US Census Bureau, 2019). The region became an important manufacturing and heavy industry hub in the late-1800s. For most of the 20th century, Pittsburgh-based US Steel was the leading global producer of steel, accounting for nearly a third of global steel output in its first year (Funding Universe, 2003). Today, the region's economy is dominated by healthcare, education, technology, and finance.

Figure 1. UPMC Presbyterian hospital

As manufacturing jobs left the United States and moved overseas in the late-1900s, the number of people in Western PA fell, too. Pittsburgh's population declined more than 50% between 1950 and 2010 (Population.us, 2016). Today, more than half of the population is age 40

or older; a community health assessment performed by Allegheny County in 2015 found that the most pressing health issues in the Pittsburgh area included aging, chronic disease, the opioid epidemic, access to care, and cultural disparities, among others (Kurta et al., 2015). These healthcare considerations are not uncommon among rust-belt and midwestern cities, but they highlight the challenges that the region was focused on before 2020.

2.0 Timeline of the Pandemic in Western Pennsylvania

By late January 2020, as US media outlets began picking up on news about the novel coronavirus from abroad, most Americans went about their daily lives without significant interruption, at most watching unfolding events with detached interest. Healthcare professionals, for the most part, were no different. Save pulmonary and infectious disease specialists, most providers were focused on what was in front of them, and the news cycle pertaining to healthcare was focused on changes to the ACA, hospital closures and mergers, and the flu season. In fact, Allegheny County was considered the epicenter of Pennsylvania's flu season in January 2020 (Hamill, 2020), likely drawing a lot of the attention of state and county epidemiologists.

Fast forward one month, and it was beginning to become clear that this novel virus was not merely a foreign problem. The US publicly reported its first COVID-19-related deaths on February 26th (Fuller & Baker, 2020). Public health officials and leaders within the healthcare industry kept close watch on developments and began formulating contingency plans should the disease reach outbreak status within pockets of the country. Still, consensus revealed no understanding and little concern that this virus could or might wreak the havoc on the nation that it eventually did. When asked about whether they perceived a 'wake-up call' at any point during the early stages of the pandemic, most UPMC employees and leaders named the outbreaks in Washington state and New York as inflection points in the way that they thought about the disease. Neither of those states began reporting more than 100 cases per day until March 12th (The New York Times, 2020).

By mid-March, it was largely too late to ease into coronavirus-related restrictions; operations leaders, infectious disease experts, and regulators decided that, to stem the spread of the disease, change was needed immediately. At UPMC, a COVID-19 Command Center was opened in early March to coordinate resources and information across the system. This command center had many responsibilities, one of which was to be the go-to resource for employees who were concerned about exposure or had questions about safety in the workplace. Quite literally overnight on Sunday, March 15th, UPMC closed hospital entrances, implemented visitor restrictions and entrance screenings, and began suspending or cancelling some elective procedures. By Monday, March 16th, the command center phones were ringing off the hook.

Figure 2. UPMC officials hold a media briefing at the start of the COVID-19 pandemic

Even at a premier medical center like UPMC Presbyterian Shadyside, healthcare was not prepared for this pandemic. Early on, there were significant concerns about supplies of personal protective equipment (PPE) and medical equipment. Much as there was a run on grocery and convenience stores to stockpile toilet paper, hand sanitizer, and non-perishable goods, hospitals experienced a run on their PPE. Employees began grabbing extra surgical masks, sometimes taking whole boxes that were left unattended. To preserve the supply chain, the hospital quarantined most of its PPE and allocated it to departments based on need and supply. Clinical laboratorians experienced shortages of the kits used to test patients for the virus that causes COVID-19. Even if they had enough tests, labs were not initially prepared with an appropriate number of hoods or analyzers to handle the volume of tests that they would need to perform.

The needs for hospital preparedness during the early stages of the pandemic extend beyond clinical considerations, however. Public safety officers were deployed to facility entrances to enforce screening, masking, and visitor policies. Facilities and engineering teams were tasked with converting existing space into COVID-capable zones with negative pressure rooms and isolation areas. Environmental services (EVS) workers and housekeepers rethought workflows to allow for more frequent and more thorough cleaning. Volunteers were expelled from hospitals until it was deemed safe for them to return, and clinical education specialists rearranged and added classes to allow for distancing in classrooms while still enabling onboarding of new nurses. This account of changes merely brushes the surface of operational challenges posed by the pandemic, but it speaks to the tremendous undertaking that hospital leaders and front-line staff were faced with as they strove to keep facilities safe for everyone involved.

In this early stage of the pandemic, managing information was a challenge above and beyond operational concerns. Throughout the week that marked the beginning of pandemic operations, guidance from system leadership changed or was updated multiple times each day, sometimes within an hour. The day-to-day uncertainty engendered within healthcare workers significant fear, anxiety, apprehension, and – eventually – frustration.

Importantly, Western Pennsylvania never faced the volume of infections, hospitalizations, and deaths that were seen in other states around the country, or even in Eastern Pennsylvania. From the beginning of March through the end of May, Allegheny County never recorded more than 100 COVID-19 cases on any single day (Allegheny County Health Department, 2020). UPMC, against state guidance, actually continued to offer some elective surgeries in cases where it was determined that delaying procedures could have adverse effects on patient safety and outcomes. Still, the massive undertaking of completely overhauling hospital operations in the span of a few days represented a tremendous burden on staff and hospital leadership. Unfortunately, as stressed as people were in March and April, the worst was yet to come.

2.1 Second Phase: "Ramping-Up" Operations

The state of healthcare in Western Pennsylvania April 2020 was bleak. UPMC Presbyterian Shadyside spent the better part of a month preparing for an onslaught of COVID-19 patients that never came. Patient volumes plummeted, and hospital revenue quickly followed suit. Not only were patients not coming in to hospitals for procedures, but many were also reluctant to go to doctors' offices or clinics to receive outpatient care. Telemedicine vaulted into the spotlight as the

hospitals scrambled to get patients reconnected with their providers, but even with this boost, outpatient visits fell short of 2019 averages and 2020 targets. As it became clear that Pittsburgh was not going to be the next New York City, Seattle, or Philadelphia, UPMC turned its attention to "ramping-up"; operational leaders needed to figure out how to get patients back into the hospitals and clinics – and how to do so in the safest possible manner.

Focus in April and May of 2020 shifted to the safety precautions that would be needed to ensure that a rebound of patient volume would not pose more risk than reward. Part of the difficulty in formalizing that notion was that stakeholders struggled to reach consensus on what operational practices were considered safe or not safe. In any novel situation, such as was faced with a once-in-century-pandemic, most people turn to the individuals that they perceive as the experts. In this case, epidemiologists, public health officials, and medical professionals had the most background expertise relevant to the subject. However, the lack of literature and precedent in the first few months of the pandemic posed a problem for consistency of messaging. Common themes emerged after a few weeks and were able to be agreed upon in short order – such as masking – but debate surrounding other approaches – such as the efficacy of social distancing and temperature screenings – continued for months.

To complicate messaging difficulties, many were faced with a barrage of conflicting and sometimes incorrect or misleading information from news and social media. The inability of the federal government to take a firm stance in support of basic public health measures at the beginning of the pandemic forced individuals to institute proxy authorities of their choice. Even for those who worked or had backgrounds in healthcare, the disparate approach to the pandemic across states, municipalities, and hospitals or public health agencies engendered significant confusion and distrust. As a result, UPMC was faced with a rumor mill: community

members and staff alike began spreading claims that the system simply didn't care about patients or staff safety, even as the hospitals struggled to enforce personal responsibility for masking and other safety precautions within their facilities.

Figure 3. UPMC Shadyside hospital bridge

Conflicting or unclear messaging from authority figures represented a significant stress for staff within the hospitals. The confusion did nothing to assuage the fear and anxiety that everyone was already experiencing. Patients were concerned about contracting illness while in hospital and immunocompromised; staff were worried about bringing illness home with them to their loved ones, some of whom were vulnerable. All of these concerns began piling on top of normal – and novel – job stresses. The dynamic of the ramp-up phase of operations was characterized by new responsibilities and workflows that were put in place while attempting to welcome patients back into care settings in volumes commensurate to the pre-pandemic months. The fundamental disconnect between workload and job expectations further weighed on clinical and non-clinical staff alike. Enhanced cleaning protocols, the adoption of entrance

screenings, and enforcement of health and safety policies became job duties for all staff members. As a result, staff burnout became a serious concern as the pandemic extended into the summer months.

Burnout concerns were only further exacerbated by staff quarantines. If a staff member was identified as having been exposed to a COVID-19 positive person, they were instructed to enter self-quarantines at home until it could be determined that they were healthy and posed no risk to other staff or patients. This was an important safety measure; in many departments, a staff member testing positive and exposing their colleagues could potentially shutter that department. In July, when multiple providers from one patient care unit at UPMC Presbyterian tested positive for the virus, the entire unit needed to be temporarily closed (WPXI News Staff, 2020). In the face of nurse and clinical provider shortages – a trend that has been a concern within healthcare for years – hospitals could not afford to lose clinical staff to quarantines, especially during a public health crisis. Quarantines were concerning for non-clinical staff, as well, however. Facilities engineers, for example, are responsible for managing such operations as hospital boilers or chillers, and many have special knowledge of hospital-specific equipment. If the entire engineering department was quarantined, it would be unlikely that the hospital could quickly fill those positions with maintenance technicians with sufficient knowledge of the specific systems that run the hospital. Many managers had the foresight to split or stagger their staffed shifts to avoid such a catastrophic occurrence. Still, staff quarantines ticked up throughout the summer as a 'second wave' of the pandemic hit Western PA in July, and the staff who remained in care settings were often left to pick up the additional workload that was left behind.

In addition to the stress and associated burnout that resulted from pandemic operations and staff quarantines, UPMC was forced to grapple with another novel workforce challenge: hospital employees were now working from home at unprecedented rates. In the first weeks of the pandemic, any staff who could perform their job duties from home were encouraged to do so. Additionally, some clinical staff – such as athletic trainers – had signifcantly fewer duties to perform as students left campuses and patients stayed home. While this workforce shift was well-suited to the initial phase of the pandemic, it became a significant human resources challenge in the late spring and beyond. As patients returned to in-person clinical visits and policy was adapted to allow one support-person to join patients in hospitals, there was greater need for employees to assist with screening, cleaning, and standard pre-pandemic clinical and non-clinical duties. However, even throughout the summer, UPMC struggled with striking a balance between brining staff back into on-site work settings, which tended to be more productive, and maintaining adherence to safety guidelines that limited the density within offices.

All of the stresses and uncertainty that characterized the ramp-up phase of operations were compounded by the struggle to decide whether policies and procedures should be handled centrally by UPMC, or whether individual hospitals should make the choices that impact them directly. Initially, most tasks were handled centrally by UPMC's Quality and Innovation team – the Wolff Center. However, as time went on, more and more tasks were delegated to individual hospitals. In part, this was out of necessity, as some of UPMC's hospitals were outside of Pennsylvania, and thus subjected to different regulations. But a decentralized approach also allowed for local leadership to receive input from their teams and front-line staff and implement plans that were most relevant to them. The downside to this is that it continued

to pile more work on to already over-taxed local operational leaders. Now, front-line leaders were tasked with managing not only standard employee relations, but also enhanced safety and operational protocols.

Each of the stresses experienced during this phase of the pandemic piled on top of one another, and some staff began to reach their limits. Some laboratorians, EVS workers, nurses, and administrators who felt overwhelmed or unsafe quit their jobs with little notice, leaving behind colleagues to pick up the slack and creating a downward spiral of stress, burnout, and turnover. Clinical and non-clinical staff shortages have been a pain point in hospitals for years, but fear of the pandemic meant that positions that were vacated during the last few months were even more difficult to fill than usual. The result was a workforce that became almost zombie-like: each day's tasks were more like a list of chores, and staff would go through the motions with the hopes of simply not falling behind. Early in the summer, there was hope that a vaccine or some novel treatment was just around the corner, and normal life would be restored before the years' end. As the summer turned to fall and the flu season approached, it became clear that the light at the end of the tunnel was still very far away.

2.2 The Third Wave

Beginning in late October 2020, Western Pennsylvania (and most of the United States) began to experience rising cases of COVID-19 infections, as well as commensurate increases in serious illness, hospitalizations, and deaths. Case counts that began slowly ticking up as students returned to school exploded following Halloween, when many are thought to have gathered in small and large groups to celebrate. These conditions were exacerbated as families and friends

gathered for the Thanksgiving and winter holidays. Many factors may have contributed to the sharp increase in infections in late 2020, but likely sources included pandemic fatigue, which led people to become more lackadaisical with safety precautions such as masking and social distancing; increasing time spent indoors as the weather in many parts of the country turned colder; and a false sense of security that led people to lower their guard when around small groups of friends and family members (Drake, 2020).

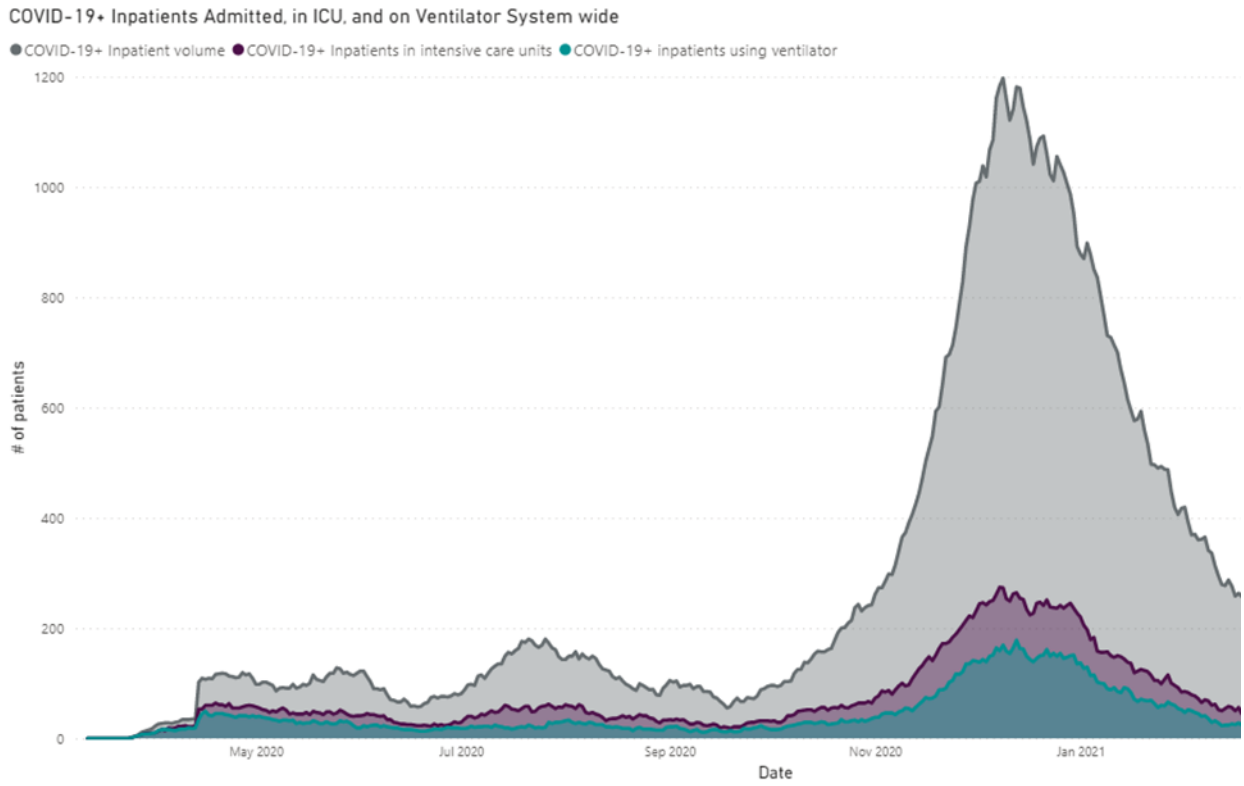

Figure 4. COVID-19 infections and hospitalizations at UPMC, March 2020 through February 2021

Regardless of the cause, one thing was certain: the "third wave" of the COVID-19 pandemic was by far the worst that many Western Pennsylvania hospitals had seen to date. At UPMC, the number of COVID-19 positive patients in hospital exceeded that of any prior point during the pandemic by October 21. One month later, that case load had more than tripled, as had the number of patients in intensive care units and the number of patients on ventilators. By

the peak of the third wave in early December, Presbyterian Shadyside was admitting nearly 80 new COVID patients each day while discharging only about half of that number. Nearly a dozen positive patients were dying each day by then.

In contrast to the first and second waves of the pandemic, UPMC did not cancel or postpone any elective surgeries within their hospitals. This decision was made in part due to the potential ramifications for population health of delaying procedures. Even non-life-threatening illnesses could have consequences for long-term wellbeing if not addressed in a timely and appropriate fashion. However, the financial standings of healthcare delivery institutions in this country were so dire in 2020 that there was serious concern that stand-alone and community hospitals were in real danger of closing, or at least signifcantly reducing operations. Even a large system like UPMC was desperate to keep surgical volumes from declining any more than they already have. As a result, beds filled, and hospital censuses rose to levels not seen before. Simultaneously, staff that had been exposed to the virus or who had a suspected exposure were forced into quarantine, leaving many units in hospitals tight on staff. Many employees elected to not take time off during this period as doing so would have negative consequences for their units' abilities to function. In fact, over the course of the entire "peak phase" of the pandemic (defined as the period between April and December 2020), only 8% of surveyed employees at Presbyterian Shadyside reported taking any kind of leave, whether paid or unpaid. This dynamic compounded the already intense stress that staff experienced while working during the surge.

Due to the magnitude of the wave that Pennsylvania witnessed in late-2020, many hospital workers described feeling more overwhelmed than they had at any point prior in the pandemic. According to the pandemic leadership survey distributed to all UPMC Presbyterian

Shadyside employees in March, 2021, during the peak phase of the pandemic, job satisfaction and motivation fell. Satisfaction declined from 85.9% pre-pandemic, to 80.7% by January 2021, while those who were dissatisfied with their jobs rose from 4.7% to 12.5% (p = 0.0339, 0.0002, respectively); motivation likewise fell from 88.0% to 80.2%, while lack of motivation rose from 2.6% to 10.4% (p = 0.0034, 0.0002, respectively).

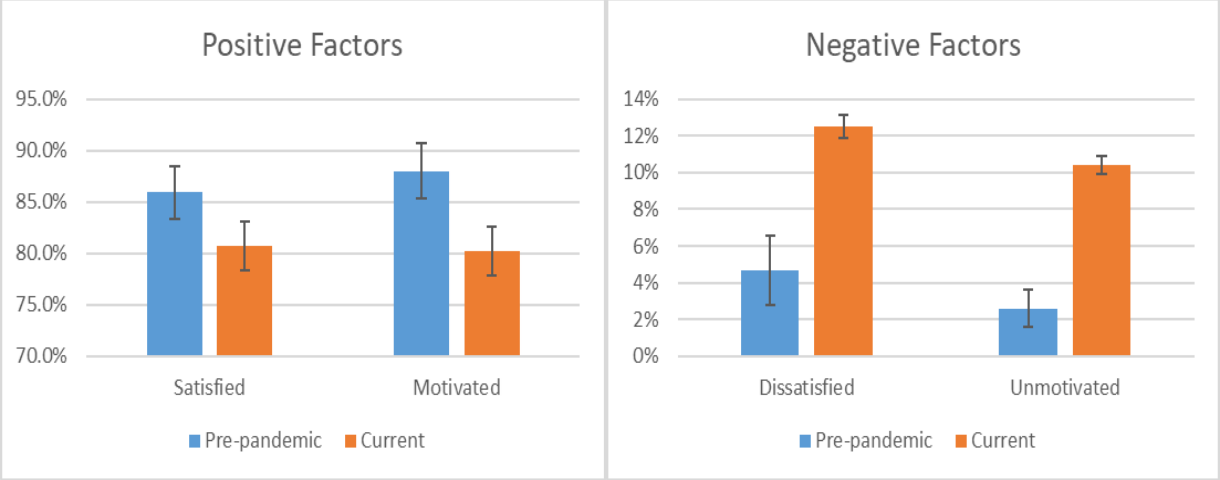

Figure 5. Employee satisfaction and motivation, pre-pandemic and current

By early December 2020, the picture of public health in the United States was dismal. However, good news was on the horizon. On December 11th, 2020, the US Food and Drug Administration (FDA) issued an Emergency Use Authorization (EUA) for the Pfizer/BioNTech COVID-19 vaccine, effectively approving it for distribution and use in the United States (US Food and Drug Administration, 2021). One week later, the FDA also issued an EUA for the Moderna COVID-19 vaccine. By December 14, as the US death toll due to the pandemic topped 300,000 lives lost, the first dose of the Pfizer vaccine was administered to New York ICU nurse Sandra Lindsay. At the same time, millions of vials of vaccine were on their way to other hospitals across the country (BBC News, 2020).

While the availability and distribution of vaccines was certainly a positive development, it did little to change on-the-ground operations in hospitals right away. It would

take months to get a sizable-enough proportion of the population immune, and that was assuming that most people would be willing to get a shot as soon as it became available to them. In the meantime, pandemic-related restrictions in hospitals, as well as in communities at-large, had to continue. Efforts to mitigate the spread of the virus seemed to pay off, however, and by the new year, infections and hospitalizations seemed to have declined significantly – at UPMC and across the country – although levels were still much higher than they had been before November. The effect on public health was palpable; not only were less people in hospitals sick with COVID-19, but healthcare workers began to feel hope again, spurred on by the United States' rapid rollout of vaccines. Still, even as the situation in Western Pennsylvania and across the US improved, the pandemic had undeniable effects on the emotional wellbeing of millions of people – particularly those that work in healthcare – which could leave lasting scars (Shreffler, Huecker, & Petrey, 2020).

3.0 The COVID-19 Pandemic Today

As of early April 2021, three vaccines to protect against COVID-19 infection have been approved for distribution in the United States: Pfizer/BioNTech, Moderna, and Janssen (Johnson & Johnson) (US Food and Drug Administration, 2021). The Pfizer and Moderna vaccines are both thought to be over 90% effective at preventing infection and virtually 100% effective at preventing serious illness and death. However, both of these vaccines require a second booster shot to be administered a few weeks after the first to realize the full benefits. In addition, both vaccines also require cold storage; in the case of the Pfizer vaccine, ultra-cold storage (-94 degrees Fahrenheit) is required to keep the vaccine from spoiling. While the Johnson & Johnson vaccine is somewhat less effective at protecting against the virus, it eases logistical concerns due to the fact that only one dose of the vaccine is required, and the vaccine can be kept at standard refrigerator temperature (Katella, 2021). To-date, UPMC has successfully vaccinated over 350,000 members of the community, as well as over 60,000 members of their own staff.

Initial roll out of vaccines had been challenging in many parts of the country, including in Pennsylvania. Poor coordination between various levels of government and the stakeholders involved in giving shots, as well as the sheer logistical difficulty of distributing millions of vaccines led to significant confusion on the part of hospitals and patients. As a result, there were numerous instances of vaccination appointment cancellations and expired doses of vaccines that occurred throughout early 2021 (Chinchilla, 2021). In addition, concern arose fairly quickly that health equity concerns were not being appropriately addressed. Hesitancy at taking the vaccines – attributable in part to misinformation and false claims about vaccine

safety – as well as historical distrust of the healthcare system among certain populations have played a role in unequitable vaccination rates, disfavoring already historically disadvantaged populations, such as minorities and low-income people (Ndugga et al., 2021).

Figure 6. A UPMC employee receives a COVID-19 vaccine in December 2020

While hospitals had little control over government allocations of vaccines, they certainly did have an important role to play when it came to distributing doses equitably and engaging hard-to-reach populations. At UPMC, leaders have vowed to open up the dialogue surrounding vaccine equity and come up with real solutions in April, which is National Minority Health month. In February, the system began to partner with local faith- and community-based organizations to distribute doses to vulnerable and hard-to-reach populations. The conversation around vaccines is ongoing today, and all stakeholders will need to continue to be engaged in order to ensure that rollout is viewed as a great success in years to come. Some experts predict that we might not return to 'normal' life until at least November

2021 (Knowledge at Wharton, 2020), and some practices that have been adopted over the past few months may never go away. Still, there are many other opportunities to reflect and learn from the myriad ways in which hospital operations have changed since the beginning of the pandemic.

3.1 Reflection on Operational Response to the Pandemic

Changes to hospital operations throughout 2020 and in to 2021 have been marked and rapid. The very infrastructure of hospitals has changed, as the demand for negative pressure rooms surged in the early days of the pandemic and managers worked to rearrange the flow of patients, support persons, and staff through hospital and clinic spaces. Use of telemedicine services for patient care has taken off, although the future of telemedicine is still unclear. In addition to clinical operations, the nature of office work in hospitals and other delivery settings has experienced a virtual overhaul. This has decreased the demand on office space in healthcare settings and has leaders questioning what the right balance between remote and on-site work is to achieve maximal employee productivity and engagement. All of these factors pose questions for the future, but those questions should be viewed through a lens of understanding the past.

One of the most important factors in hospital operations since March 2020 has been communication. Information changed at a rapid pace throughout this year, but especially during the first phase of pandemic operations. Conveying this information quickly and effectively was a major challenge for leaders at UPMC Presbyterian Shadyside. Daily “Covid Calls” kept operational stakeholders up-to-date on the newest developments, but at times the

pace of information change was overwhelming for front-line staff. Departmental directors and managers were tasked with parsing through information to determine what was both new and relevant to their operations. This information sorting consumed valuable time that could scarcely be afforded, particularly as volumes picked up and standard duties became more stressful. Additionally, communicating in a way that everyone could understand was difficult at UPMC. The novelty of the situation meant that very few people – clinical providers and technicians included – were familiar with the scientific or medical jargon that was being used. Politicization of a public health crisis – a decidedly apolitical problem – further served to undermine the efficacy of common sense and science-backed best practices in public health. The novelty of the pandemic combined with disparate messaging across governments, provider networks, and social media made quality information less accessible to people and, ultimately, added to the fear and apprehension that staff and community members were already experiencing.

Another major challenge that UPMC faced throughout the pandemic has been to determine which operations decisions should be centralized, and which should be delegated to individual hospitals. This debate was not just being held at care delivery sites, either. Part of the confusion as it pertained to messaging during the pandemic stemmed from a federal government that was generally unsupportive of national control of the response. In turn, state-by-state, county-by-county, and even hospital-by-hospital approaches were developed that led to disjointed operations across the nation and disparate health outcomes dependent on the particular location in question. As previously mentioned, the centralized vs. decentralized debate led to a significant amount of contention, some of which remains unresolved. From a front-line staff perspective, this lack of consistency and decisiveness has contributed to general

confusion, and may have even prompted distrust in hospital and corporate leadership: 22% of respondents to the pandemic leadership survey at UPMC said that the pandemic has changed the way that they view UPMC for the worse. Staff distrust was only fortified by misinformation that circulated online and in the news media. Effective management of the pandemic in hospitals quickly became as much about debunking false and potentially damaging claims as it was about managing people and facilities safely.

In times of emergency, people also tend to turn to governments and policy officials for guidance and protection. The general lack of a coordinated national approach to the pandemic in the United States early on meant that each state had the agency to implement its own policies. Once again, staff and patients alike were faced with a confusing blend of conflicting approaches across states and health systems. The action and inaction of the government is largely out of the hands of individuals and corporations like UPMC, but consumers and producers of healthcare alike tend to mostly express concerns as they pertain to the arenas that are most salient to them or easiest for them to influence. This became problematic when it came to PPE shortages or lack of testing infrastructure. The community placed blame for these resource challenges on UPMC, but in reality, testing and PPE supplies were regulated and restricted by state and federal governments. Resource constraints continue to be a very real and very complex challenge, but a cursory glance doesn't reveal that every step of pandemic planning has been a collaborative effort among hospitals, health plans, pharmaceutical companies, public health experts, and many more.

3.2 Recommendations for the Future

3.2.1 Unity of Response to a National (and Global) Crisis

First and foremost, it is time to recognize that a national disaster on this scale requires a concerted, unified response by the government in collaboration with non-governmental stakeholders. The federal response to the pandemic was delayed and lackluster, and considerable onus was put on states to develop and enforce public health regulations and grapple with supply chain difficulties on their own. While there are other arguments to be had regarding state versus federal governments rights and responsibilities, it is important to recognize that crises to the scale of a pandemic cannot be dealt with in a partisan political manner, because viruses do not heed political boundaries. The federal government has the greatest access to the resources needed to combat public health crises on a national level, and so it is the responsibility of the federal government to deploy those resources as quickly, equitably, and efficiently as possible. After these resources are made available to whomever needs them most, additional conversations around delegating powers to lower levels of government may occur.

3.2.2 Aid for Ailing Hospitals and Systems

The economic incentives currently in play do not lend themselves to the long-term sustainability of the healthcare sector, but those incentives can be changed. Limiting unnecessary medical activity in the face of a pandemic protects the health of the public, and incentivizing working in hospitals would also revitalize the healthcare workforce.

Hospitals cannot shoulder the entire cost of such policies by themselves, however. Rural hospitals or those that serve complex populations were already financially strained prior to 2020, and the added stress of the pandemic raises concerns that some healthcare institutions will not be able to recover. Government aid in the form of subsidies to halt elective procedures and hazard pay for healthcare workers are ways to ensure that the US health system can meet the needs of the populace during crises times and in the years that follow.

3.2.3 Smart HR Solutions to Address Burnout

Healthcare delivery organizations can take action to support themselves, too. Leaders need to recognize when their staffs are stressed, burned out, and at their limits. Smart human resources solutions need to be evaluated and implemented quickly, before the stresses of working in a hospital leave indelible scars on the workforce. Regular review of overtime and paid sick leave or time off is warranted, and care should be taken to ensure that no employees are overexerting themselves (Carriere et al., 2020). Expansion of benefits such as child care will also go far in improving the flexibility of the workforce to meet the changing dynamic of pandemic operations. At its core, though, strong leadership is about understanding employees needs and challenges. Managers, directors, and executives all need to be prepared to listen more and directly address what their staff is saying. No leaders should ask their employees to do something that they themselves would not do; simple acts such as helping to clean inpatient rooms or supporting clinical staff on a unit can go a long way in demonstrating commitment to the people that allow hospitals to run.

3.2.4 A Clear, Comprehensive Plan for Work-from-Home

Human resources also needs to continue to be engaged with multiple other operational stakeholders as non-clinical staff begin to return from remote work. As the virus spread throughout the community in March 2020, many non-essential staff that were able to complete their job duties from home were encouraged to do so. However, as viral case loads continue to decline and leaders recognize that working in offices – especially hospital-based offices – can be made very safe, employers will need to come up with standardized policies for work-from-home functions. The worst course of action would be the "do nothing" approach; lack of standardization of policy early on has raised concerns about abuses of work-from-home and declining employee engagement and productivity. While there are clear benefits to working remotely, and smart work-from-home policy may actually boost productivity and job satisfaction, lack of consistency makes managing these employees very challenging (Lucanus, 2021). As such, developing consistent policy – and recognizing that these novel policies should not necessarily be rigid – will be crucial to successful management of the workforce of the future.

3.2.5 Policy and Procedure to Ensure Vaccine Equity

As it pertains to the development and distribution of vaccines, both governmental and private stakeholders can take steps to ensure that all stakeholders have equitable access to safe, effective vaccines. Operation Warp Speed was an early win in this fight, but ongoing funding and direction from the federal government is needed for follow through coordination (Shulkin, 2021). That being said, it is important to recognize that local care

delivery organizations are perhaps the best equipped to meet the needs of the communities that they already serve. Some of the most successful states at distributing vaccines have been those that have been able to reach their hard-to-reach populations by bringing doses to those populations and not expecting those populations to come find the doses at a centralized distribution site.

3.2.6 Commitment to the Betterment of Public Health

Perhaps most importantly, leadership at every level of every stakeholder group in this country must remain resolute and demonstrate that we are united in our will to tackle the pandemic and demonstrate commitment to public health at large. We have learned much from the past year, and it would be tragic if we did not implement real change to reflect what we have learned. Healthcare delivery and public health have traditionally operated in silos, but this cannot be the dynamic any longer. Particularly as healthcare grows to be more value-based and population-focused, providers will need to include public health partners in decision making and strategic planning processes if they hope to achieve the greatest benefit for the population. Similarly, public health leaders and advocates will need to include healthcare delivery stakeholders in population health management and disaster planning and response, as these stakeholders are perhaps best equipped to determine which interventions are the most feasible.

4.0 Conclusion

By the end of 2020, many healthcare leaders had the sense that hospitals were sitting on a powder keg. While the situation has undeniably improved since then, it is not clear that the underlying issues facing the industry have as of yet been fully addressed. The short-term operational responses to the pandemic that were implemented in March 2020 are simply not sustainable for months on end, much less for over a year. By December, staff were hopelessly burned out and many were scared. Stretching their capabilities when many were already at a breaking point drew intense criticism, and many were worried that operational choices made in 2020 have destabilize the industry in the long run. Vaccines have provided many with a sense of security that they have not felt for many months, but the pandemic is not over. Healthcare is still in crisis, and the financial standing of delivery institutions in this country poses a risk to the safety and wellbeing of American people. Recent wobbles in the progress that has been made with respect to reducing infections and hospitalizations have highlighted these concerns. The current trajectory of the industry paints a grim picture; if action is not taken, hospital will close, and closures will happen more rapidly in already-underserved rural communities (Tribble, 2020). Still, there is hope; policies still exist that have not been implemented or implemented fully that may serve to improve the long-term sustainability of the sector.

The policy recommendations outlined above are high-level and do not reflect the complexities that adoption and implementation will require, and a few short paragraphs are certainly not reflective of an exhaustive list of effective policy measures. There will be no one silver bullet to end the pandemic or revitalize hospital operations in this country; rather, any

progress made will by necessity need to be a product of collaboration and incrementalism. There remains much work yet to be done to secure the future of the healthcare industry, but what has been accomplished in the face of travesty is a feat in itself. Anyone who works in healthcare should be proud to be a part of an institution that has improved the lives of millions. The future remains uncertain, but every individual has the power to impact the outcome.

Appendix A Pandemic Leadership Survey

Pandemic Leadership Survey

Section 1

1. What is your age?
   [Text response]

2. What is your gender?
   [Choose one]
   Male
   Female
   Non-binary/Non-conforming
   Prefer not to disclose

3. Which UPMC hospital do your currently work at?
   [Select from dropdown]
   UPMC Children's Hospital
   UPMC Magee
   UPMC Mercy
   UPMC Presbyterian
   UPMC Shadyside
   I do not work in a hospital
   Other

4. At the start of the COVID-19 pandemic, where were you working?
   [Choose one]
   At the same hospital that I am currently at
   At a different UPMC hospital
   At a different non-UPMC hospital
   In healthcare, but not in a hospital
   Not in healthcare

5. How long have you worked in healthcare?
   [Choose one]
   Less than 1 year
   1-5 years
   6-10 years
   More than 10 years

6. How long have you worked for UPMC?
   [Choose one]
   Less than 1 year

1-5 years
6-10 years
More than 10 years

7. Which of the following best describes your current role? (Select all that apply)
   [Select multiple]
   I work in patient areas and provide clinical care
   I work in patient areas, but I do not provide clinical care
   I work in a clinical setting, but do not often interact directly with patients
   I work in a non-clinical setting that is near patients
   I work in a non-clinical setting that is not near patients
   I work remotely/from home
   Other

Section 2

8. Prior to March 2020, how would you rate your satisfaction with your job at UPMC?
   [Choose one]
   Very satisfied
   Somewhat satisfied
   Neither satisfied nor dissatisfied
   Somewhat dissatisfied
   Very dissatisfied
   N/A

9. Prior to March 2020, how motivated did you feel to come to work at UPMC each day?
   [Choose one]
   Very motivated
   Somewhat motivated
   Neither motivated nor unmotivated
   Somewhat unmotivated
   Very unmotivated
   N/A

10. How concerned were you for the health and safety of yourself or your loved ones during the height of the COVID-19 pandemic (April to December, 2020)?
    [Choose one]
    Very concerned
    Somewhat concerned
    Neither concerned nor unconcerned
    Somewhat unconcerned
    Very unconcerned
    N/A

11. How good of a job do you feel that UPMC did in changing basic hospital functions and workflows in response to the pandemic?
    [Choose one]

Very good
Good
Fair
Poor
Very poor
N/A

12. How good of a job do you feel that UPMC did in responding to the needs of their employees in the first few months of the pandemic?
    [Choose one]
    Very good
    Good
    Fair
    Poor
    Very poor
    N/A

13. What, if anything, do you think UPMC did well in their response to the pandemic?
    [Text response]

14. What more, if anything, do you think that UPMC could have done in their response to the pandemic?
    [Text response]

15. How motivated did you feel to come to work at UPMC each day during the height of the pandemic (April to December, 2020)?
    [Choose one]
    Very motivated
    Somewhat motivated
    Neither motivated nor unmotivated
    Somewhat unmotivated
    Very unmotivated
    N/A

16. How often did you consider leaving your position at UPMC as a direct result of the stress of the pandemic?
    [Choose one]
    Daily
    Weekly
    Monthly
    Seldom
    Never
    N/A

17. During the height of the pandemic (April to December, 2020), did you take paid or unpaid leave to attempt to recover from the stress of work?

[Choose one]
I took paid leave
I took unpaid leave
I took both paid and unpaid leave
I took neither paid nor unpaid leave
N/A

18. Please provide any other comments you may have about UPMC's actions during the first few months of the pandemic.
    [Text response]

Section 3

19. How equitable and fair do you think the roll-out of UPMC's vaccination efforts have been?
    [Choose one]
    Very fair
    Somewhat fair
    Neither fair nor unfair
    Somewhat unfair
    Very unfair
    N/A

20. Currently, how motivated do you feel to come back to work at UPMC each day?
    [Choose one]
    Very motivated
    Somewhat motivated
    Neither motivated nor unmotivated
    Somewhat unmotivated
    Very unmotivated
    N/A

21. Currently, how would you rate your satisfaction with your job at UPMC?
    [Choose one]
    Very satisfied
    Somewhat satisfied
    Neither satisfied nor dissatisfied
    Somewhat dissatisfied
    Very dissatisfied
    N/A

22. How much do you trust UPMC to appropriately respond to a public health emergency, such as a pandemic, in the future?
    [Choose one]
    Very much
    Somewhat
    Neutral

Not very much
Not at all
N/A

23. To what extent has the pandemic changed the way you view UPMC as a company for the better?

    [Choose one]
    Very much
    Somewhat
    Neutral
    Not very much
    Not at all
    N/A

24. To what extent has the pandemic changed the way you view UPMC as a company for the worse?

    [Choose one]
    Very much
    Somewhat
    Neutral
    Not very much
    Not at all
    N/A

25. Please select some words below that describe how you feel when thinking about the future.

    [Select multiple]
    Hopeful
    Relieved
    Disappointed
    Exhausted
    Nervous
    Saddened
    Fearful
    Eager
    Angry
    Indifferent
    Pleased
    Proud

26. Please provide any other comments you may have regarding the topic of this survey.

    [Text response].

Appendix B Pandemic Leadership Survey Comment Word Cloud

Figure 7. Word cloud of staff comments from the Pandemic Leadership Survey

Appendix C Selected Pandemic Leadership Survey Results

Appendix C.1 Question 10

How concerned were you for the health and safety of yourself or your loved ones during the height of the COVID-19 pandemic (April to December, 2020)?

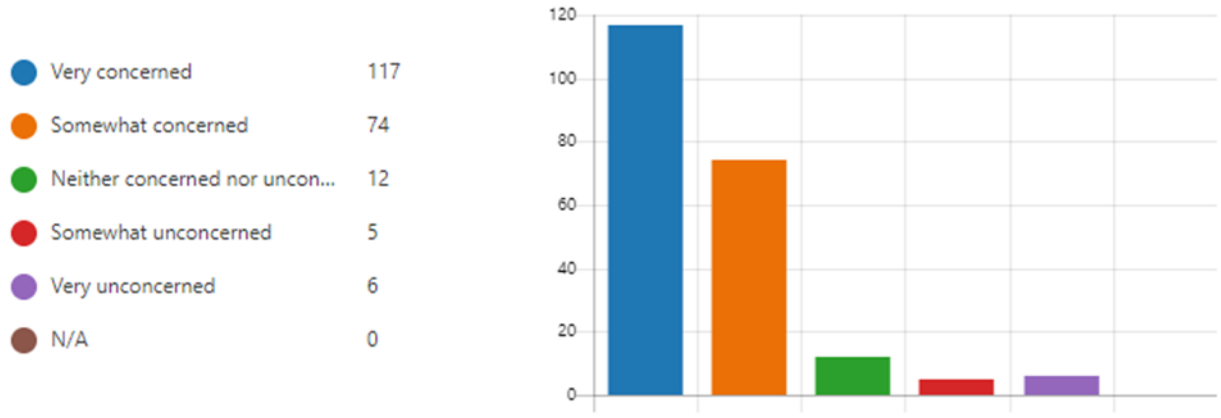

Figure 8. Survey question 10 responses

Appendix C.2 Question 16

How often did you consider leaving your position at UPMC as a direct result of the stress of the pandemic?

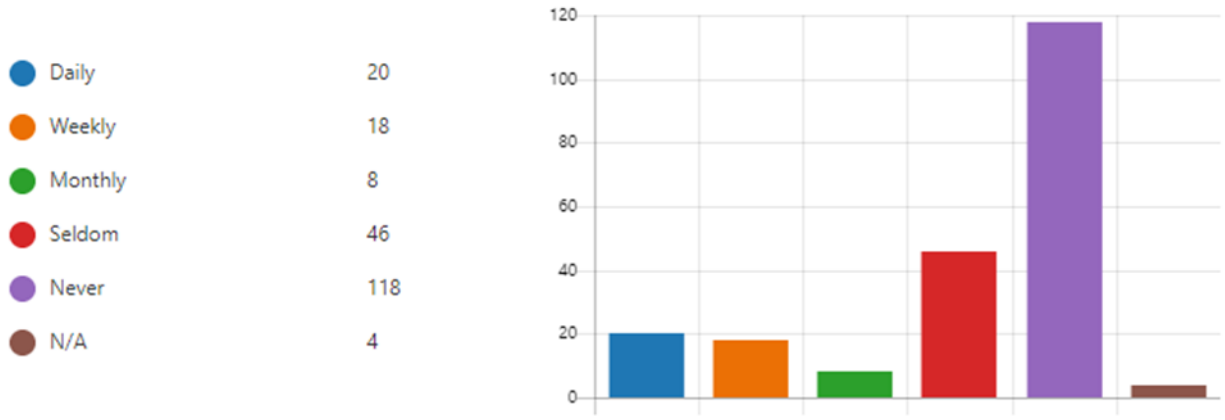

Figure 9. Survey question 16 responses

Appendix C.3 Question 17

During the height of the pandemic (April to December, 2020), did you take paid or unpaid leave to attempt to recover from the stress of work?

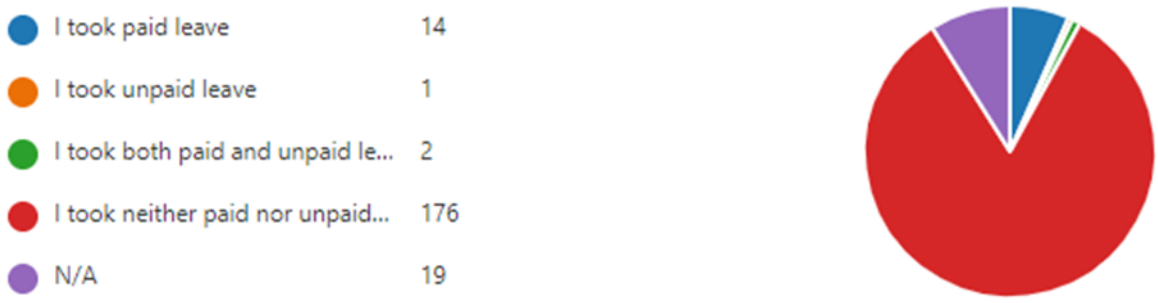

Figure 10. Survey question 16 responses

Appendix C.4 Question 25

Please select some words below that describe how you feel when thinking about the future.

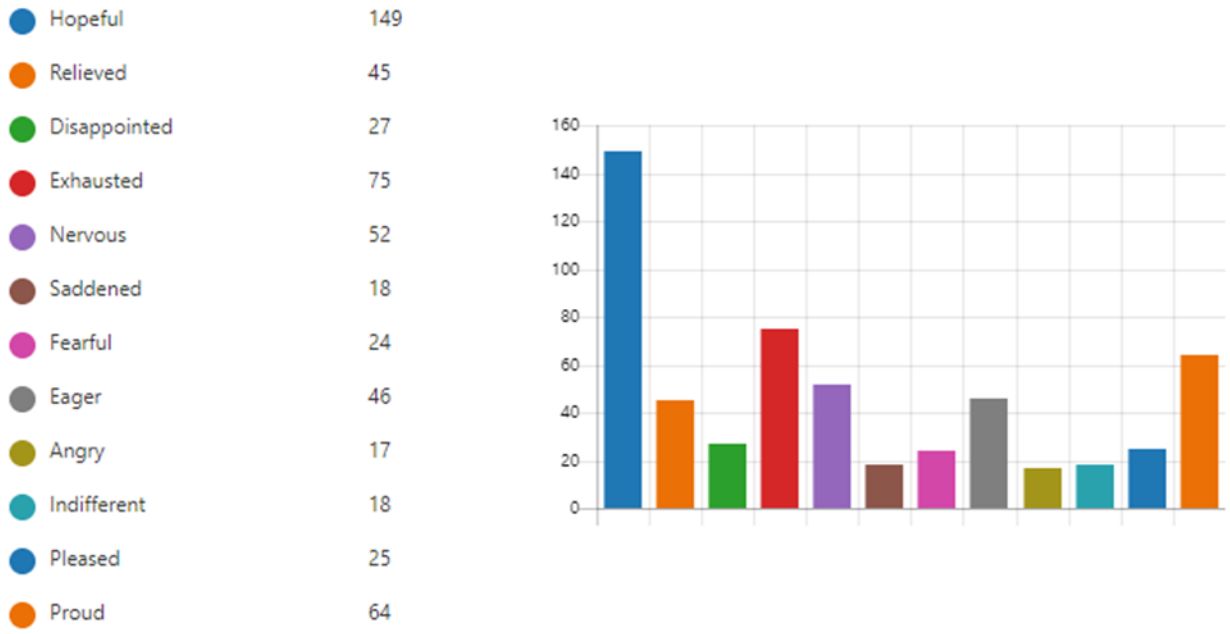

Figure 11. Survey question 25 responses

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