Life nowadays is completely unexpected. A few months ago I was sitting at my desk, a high school senior, excited to graduate in a few months with few plans for the future. I had no idea I'd soon be working an unpaid administrative manufacturing job that would protect my community. In fact, that option wasn't even lingering at the back of my mind. In the early months of 2020 I felt no impending sense of panic, no urgency to protect my friends and neighbors, no drive to learn skills I never thought could be so crucial. I was an inexperienced activist then, a veteran lobbyist and opinion writer, talented at calling for action but not at making a direct impact. When everything changed in a matter of weeks, I was forced to learn an entirely new form of activism. As a leader at the Midcoast Pop-Up PPE Factory, I made an impact I never thought possible and learned what true patriotism looks like. Most importantly, I came to understand the power of small American communities to mobilize in the face of a crisis and become self-sustainable.

In December of 2019, an unidentified pneumonia-like illness in Wuhan, China, changed life as we know it. The virus infected dozens within a highly populated region, raising concern among Chinese doctors. A few weeks later, a 61-year-old man in the Wuhan area died from the disease[1]. By mid January, the mysterious virus had spread to Japan, South Korea, and Thailand. On January 21, The United States had its first confirmed case– a man who had recently traveled from the Wuhan area to Washington State[2]. Cases began to spike across the globe, and the World Health Organization declared a global health emergency. Not long after, the disease was given a name: covid-19, an acronym short for "coronavirus disease 2019". By then, there were 393 cases outside of China in 24 other countries[3].

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[1] Derrick B. Taylor, "How The Coronavirus Pandemic Unfolded: A Timeline," *The New York Times*, May 12, 2020
[2] Ibid.
[3] Ibid.

By March, the virus had spiraled out of control. The United States saw its first death while Italy's healthcare system became completely overwhelmed with suffering infected patients. Before long, the World Health Organization dubbed the situation a "global pandemic"[4]. The Centers for Disease Control and Prevention (C.D.C.) recommended no gatherings of fifty people or more before later cutting the number down to ten. In late March, the United States led the world in confirmed cases with at least 81,321 infections and more than 1,000 deaths[5]. Businesses and schools closed down all over the country, putting nearly 10 million Americans out of work. 6.6 million Americans applied for unemployment benefits by the end of March[6]. On March 12, the virus hit close to home– Maine had its first confirmed case[7]. Three days later on March 15, Watershed School, where I was just about to complete my highschool career, closed its doors and announced a shift to remote learning. Everything seemed entirely upside down.

Before long, hospitals in the United States began reporting shortages of key equipment needed to care for the infected. Ventilators for critically ill patients and personal protective equipment (PPE) such as face masks, gloves, hair nets, and face shields were in low supply[8]. Face masks were critical to keeping medical staff safe– after a Boston hospital instated a face mask requirement for all staff, the covid-19 diagnoses among their healthcare workers dropped by 50%[9]. But the equipment necessary was lost in the supply chain. Without access to necessary PPE, Italy's overwhelmed hospitals saw a vicious spike in infections among their doctors and

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[4] Megan L. Ranney, Valerie Griffeth, and Ashish K. Jha, "Critical Supply Shortages–The Need for Ventilators and Personal Protective Equipment During the Covid-19 Pandemic," *The New England Journal of Medicine*, April 30, 2020

[5] Derrick B. Taylor, "How The Coronavirus Pandemic Unfolded: A Timeline," *The New York Times*, May 12, 2020

[6] Ibid.

[7] Gabrielle Fonrouge, "First Coronavirus Case Reported in Maine," *New York Post*, March 12, 2020

[8] Megan L. Ranney, Valerie Griffeth, and Ashish K. Jha, "Critical Supply Shortages–The Need for Ventilators and Personal Protective Equipment During the Covid-19 Pandemic," *The New England Journal of Medicine*, April 30, 2020

[9] Carey Goldberg, "Coronavirus Diagnoses In Staff Drop By Half After Boston Hospital Requires Masks for All," *WBUR*, April 23, 2020

nurses[10]. It soon became clear that unless the demand for PPE was met, American healthcare workers would face a similar fate. Estimates showed that the U.S. would need far more respirators and surgical masks than were available– particularly N95 face coverings, which filter out 95 percent or airborne particles[11]. In Early March, the U.S. Department of Health and Human Services announced that the country's stockpile of N95 respirators was only enough to meet about 1 percent of the three billion masks the country would need[12].

The necessary equipment would not come our way. Before the pandemic, China produced approximately half of the world's face masks[13]. As infections spread, mask exports halted, especially westward. The United States was on its own without a foreign supplier, and the people on the front lines became desperate. Healthcare workers searched desperately for face coverings, even dedicating social media accounts to their efforts, posting the hashtag #GetMePPE. The only solution recommended by the C.D.C. was to reuse masks intended for one-time-only use or to cover up using a scarf or bandana[14]. In early April, the Joint Commission announced its support of healthcare staff to bring their own "standard" or uncertified face masks or respirators to work if their healthcare organizations were not able to provide the necessary equipment[15]. It was this reliance on makeshift coverings that sparked an idea in Michael Mullins, who would soon join a mass movement to meet the demand for face masks from home.

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[10] Megan L. Ranney, Valerie Griffeth, and Ashish K. Jha, "Critical Supply Shortages–The Need for Ventilators and Personal Protective Equipment During the Covid-19 Pandemic," *The New England Journal of Medicine*, April 30, 2020

[11] Ibid.

[12] Christian Britschgi, "U.S. Needs Billions of New Masks to Combat Coronavirus. Feds Say It'll Take Up to 90 Days to Approve New Mask Making Facilities.," *Reason*, March 24, 2020

[13] Keith Bradsher and Liz Alderman, "The World Needs Masks. China Makes Them,But Has Been Hoarding Them.," *The New York Times*, March 13, 2020

[14] Christian Britschgi, "U.S. Needs Billions of New Masks to Combat Coronavirus. Feds Say It'll Take Up to 90 Days to Approve New Mask Making Facilities.," *Reason*, March 24, 2020

[15] Chaunie Brusie, "JCAHO Gives an OK for Clinicians To Wear PPE & Masks From Home After Many Were Reprimanded," *Nurse.org*, April 2, 2020

Throughout the country, in small town cottages and noisy city apartments, in the hearts of patriots looking to help their neighbors, something incredible happened. Activists, seamstresses, fashion designers, and hobby stitchers compiled their skills to meet the PPE demand from home. Clubs formed. Coalitions of volunteers made plans for mass operations. Soon, communities were saving themselves. In New York, Sabrina Hoffman and The Masked Warriors Project of more than 1,400 sewers handmade masks for their local Rockland County hospitals experiencing PPE shortages[16]. In Chicago, Bill Purdue turned an auto trim and upholstery shop into a mask-making factory[17]. Ayan Gupta, a 17-year-old student at Tesla STEM High School in Redmond, Washington, teamed up with his classmates to make clips for cotton face masks on his school's 3D printer[18]. In New Haven, Connecticut, members of the group MakeHaven sewed hundreds of masks for the Yale New Haven Hospital[19]. At Cornell University, two dozen volunteers gathered at Bartels Hall to sew masks for Cayuga Medical Center in Ithaca[20]. The trend caught on outside the country, as well. In Spain, a mask-making task force that included nuns and members of the Spanish Air Force began making 500 masks a day at the Paratroop School in Murcia[21]. In Kosovo, inmates at a women's prison volunteered to make masks[22]. Communities around the world were determined to protect their citizens and healthcare workers with what they had. I

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[16] Maxine Lipner, "Volunteers Work with Hospitals to Make Emergency Face Masks for Workers," *Today*, March 31, 2020
[17] Tammy Webber, Dee-Ann Durbin, and Anne D'Innocenzio, "Volunteers Sew Masks for Health Workers Facing Shortages," *ABC News*, March 24, 2020
[18] Kurt Schlosser, "Face It, These Mask-Making Efforts during the COVID-19 Crisis Reveal Who We Really Are," *GeekWire*, April 16, 2020
[19] Emily Hays, "Volunteers Sew 400 Masks," *New Haven Independent*, April 2, 2020
[20] Joe Wilensky, "Bartels Hall Hosts Surgical Mask-Making Effort," *Cornell Chronicle*, March 26, 2020
[21] Tammy Webber, Dee-Ann Durbin, and Anne D'Innocenzio, "Volunteers Sew Masks for Health Workers Facing Shortages," *ABC News*, March 24, 2020
[22] Ibid.

remember hearing about these efforts and desperately wanting to join in the movement. Luckily enough, I would soon have that opportunity.

Michael Mullins of Rockland, Maine, owned a property in Camden that housed a large storage area primarily used by a local non-profit. Forward-thinking and creative, Michael quickly formulated a plan to transform the space into a factory. He wanted to mass-produce face masks for healthcare workers, and he wasn't the only one. Michael quickly gathered a group of volunteers, mostly veteran sewers with design experience, to help him run the project. The group quickly made designs for a series of masks, both reusable and disposable. They acquired donated materials and got to work. Production at the Midcoast Pop-Up PPE Factory began on Tuesday, March 24. Not long after, I stepped into the building for the first time.

I first heard of the factory through my mother, who had already been sewing cloth masks for weeks. She told me there was a group of volunteers who were mass-producing face masks in downtown Camden and that she wanted to donate her own masks to their customers. Desperately in need of something to keep me busy, I went with her to check out the operation in early April. At that point there were no more than four volunteers cutting fabric at a few wobbly folding tables. The building itself was still very much a warehouse– the few sewing machines and packaging stations were surrounded by mountains of cardboard boxes and bags of clothes for a local charity group. The assembly line seemed hastily thrown together, but the volunteers were all in good spirits and excited to show us around. Michael Mullins introduced us to his team and explained their system.

I told Michael I was ready to help when he needed me, so he put me to work that day. I spent the afternoon gluing parts onto mask-making kits and thoroughly enjoying myself.

Mindless labor is my favorite form of meditation. Finally, I felt like I was doing something truly proactive for my community during the pandemic. I was done feeling helpless.

At that point it was very much a small-scale operation. There were only a few volunteers in at one time, and we were only producing around fifty of any one mask design per day. The PUPPE ("puppy", as I'd later call it) was no industrial wonder yet. But Michael had a vision. After learning about my experience as an activist, he offered to take me on as "volunteer coordinator". I agreed enthusiastically. If there's anything I'm good at, it's bossing people around. I was optimistic– maybe I really *could* be of use in an operation as crucial as this one. I wrote up a memorandum of understanding and committed to working at the factory for the next four weeks, from April 15 until May 13. I pledged to help with the physical labor of organizing materials for sewers, sew masks at home alongside my mother, help to manage the PUPPE's social media accounts, develop new marketing strategies for our mission, keep track of volunteers, organize orders from customers, develop outreach to consumers, and record the project's progress. It was a big commitment, but I was ready for it. I had no idea how much I'd learn and how my focus at the factory would shift and grow during my time there.

On April 8, Midcoast Pop-Up's first products became available to consumers. The two designs we began producing were made out of SMS material (commonly used for medical purposes) which had been donated to us. Our first mask was designed to be used as a cover for an N95 respirator, with the idea that healthcare workers could wash the cover after every use, allowing the N95 to remain germ-free and intact for a longer period of time. The other design, a pleated mask, was meant to provide protection on its own with the help of a disposable filter insert. But the creativity of our sewing team didn't stop there. Soon we had four different mask

designs, many of which could be made out of both SMS and cotton fabric. With a little help from my mother, who quickly became one of the PUPPE's most reliable design experts, we created a cotton pleated mask that could also take a polypropylene insert. Our other volunteers found a popular design for another cotton mask, the Olson, which provided plenty of coverage and had a pocket for a filter insert. We produced the N95 covers with our donated cotton fabric as well, and soon devoted plenty of our time to the quickest and easiest mask to produce: the disposable duckbill respirator. We had plenty to offer.

We had four different mask types, a quickening production pace, and a fast-growing group of eager volunteers. But we had nowhere to send our finished products. When I first came to the factory, Michael was relying on Facebook messages and word of mouth to take orders for masks. We completed our first big order of 100 duckbill respirators to local essential business Seacoast Security on April 14. We provided masks for healthcare workers like Patricia Audie, who came all the way up from her job at Wentworth Douglas Hospital in Dover, New Hampshire. Patricia, who specialized in outpatient infusion and caring for people with compromised immune systems, provided our first reviews on our new products. She was thrilled with them. Sending her home with a box full of PPE was the first time I really saw the impact we were making on our workers. But we needed to generate more orders. I decided to create an online order form using Google Forms. My final product was simple yet effective– it advertised every one of our designs and would provide us with enough information to contact customers. At the time, I thought it would do the job of filtering orders from healthcare workers and essential businesses. Soon, everything changed.

In early April, the C.D.C. recommended that the general public wear "cloth face coverings in public settings where other social distancing measures are difficult to maintain (e.g. grocery stores and pharmacies) especially in areas of significant community-based transmission."[23] On April 29, the Mills Administration in Maine mirrored these recommendations, announcing an executive order stating that everyone who enters a public place where physical distancing is difficult to maintain would be required to wear a cloth face mask or covering to help prevent the spread of covid-19[24]. Suddenly it wasn't just healthcare workers scrambling to get masks; it was regular citizens, as well. Small businesses would also need a supply of PPE if they were to open up again. Shortly after we made our order form public online, we were overwhelmed with dozens of orders from panicked Mainers and business owners. In just over 24 hours our orders jumped from five to eighty, and a day after that it was a hundred. By my second full week at the factory, we had 130 orders on the books for over 3,000 masks. At the time we were only producing around 450 units per week, and that was just materials for making masks rather than the final products themselves. I found it hard to believe we were ever going to send out 3,000 masks, let alone when our customers needed them. I knew I would need to refine our system in order to get necessary PPE to everyone who needed it.

The reason for the sudden boom in orders, in Michael's words, was "limitless demand". We were offering an infinite amount of masks with almost no price tag to anyone who wanted them. When there are no barriers to purchasing, Michael explained, people will request as much as they want. I took this into consideration while determining how to handle our enormous order list. Perhaps I should've set some limits beforehand. Was it too late to go back and set them

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[23] Meg Wagner, "Here's What Health Experts Say about Face Masks," *CNN*, April 3, 2020
[24] Dennis Hoey, "Governor's Order Will Require Everyone to Wear Face Masks in Public Places, Starting Friday," *Portland Press Herald*, April 30, 2020

now? Eventually I realized we simply didn't have a choice. There was no way we could give everyone exactly what they wanted, especially when relying on a dozen or so volunteers sewing masks from home. I decided to cap all orders for personal use at six masks– enough to protect an average family while one product is in the wash. I capped orders from local businesses to fifteen masks with the reasoning that most small businesses have around fifteen people working at once. I notified all our customers of the change and let everyone know that they were allowed to place another order if they felt they'd be in need of more PPE. I also decided to take away the choice between our many reusable designs– most of our customers didn't know or necessarily care about the difference between the Olson, cover, and pleated designs– they simply wanted a mask they could wash and reuse. So I only distinguished between "reusable" and "disposable" masks, sending customers home with whatever was available. I refined an order-filling system, readying around ten orders per day, and got to work chipping away at the list.

There was another problem creeping up on us: in the beginning, Michael had made it his mission to make our masks as affordable as humanly possible. He gave away small orders of masks for free and priced orders of over ten products at $0.10 per mask. As we quickly ran out of donated materials, we realized this system was not at all sustainable. When we ran out of donated fabric we began buying it at a discount from Fiddlehead Artisan Supply in Belfast. Although we were excited to be sourcing our materials from a local business, we still couldn't necessarily afford it. We needed to find a way to price our masks while still remaining non-profit. The price of production fluctuated from week to week, but when we were producing our highest quality cloth masks, we found that the price to make one mask usually came out to around $1.80. I recommended to Michael that we change our payment system from "10 for $1" to "by donation",

with a suggested contribution amount. Most volunteers were on board with this new system, so I notified customers. Our suggested donation price was $2.00 per mask. We hoped that the extra $0.20 would cover our shipping expenses for sending kits, orders, and other supplies to customers and volunteers from afar.

The focus of the PUPPE was shifting. Rather than supplying hospitals like Michael had originally envisioned, we were supplying our friends, neighbors, and favorite local shops. The volunteers all agreed: we needed to define our goal under these new circumstances. Eventually, the PUPPE leadership team determined our goal to be stimulating and reopening Maine's economy by working with and providing masks to local businesses as well as maintaining safety among community members. We also realized that we needed to re-define our product; before, we had been producing completed masks. Now, we were more focused on the "kits", or sets of mask-making materials, that we were sending off with volunteers. Home stitchers, or volunteers who preferred to make masks on their own machines, provided almost all of our products. Because we relied on them so heavily, our entire production line was based around cutting fabric into the various shapes and sizes required to make "kits". We invested in a laser cutter, which, manned by our chief engineer Shawn Albertson, soon allowed us to produce thousands of kits every week. The factory was up and running, and we were in business.

During the factory's busiest weeks I was sure to invest my time in more than just our order sheet. I wanted to be involved in the mask-making process from start to finish. We were fortunate enough to have a leadership team of talented teachers, and with their help, I gained a plethora of skills. Karla Doremus-Tranfield and Justice Yanik, who'd both been on board since the founding of the factory, taught me how to make our disposable duckbill mask step-by-step.

Karla taught me how to layer the SMS and polypropylene and add a nose clip and elastic straps. Justice showed me how to stitch the whole thing together and cut away the excess material. Before long I was making completed masks at the factory and then going home to sew more on my own machine. I spent many late nights obsessing over the number of masks I could complete in one sitting. There was something invigorating and addictive about seeing the process through to the end.

From other volunteers I learned how to work technology like never before. When I first began working at the factory, I couldn't even thread a sewing machine. I was quick to learn that I'd need to be proficient at these kinds of tasks in order to make enough masks to put a dent in our order list. Through trial and error, I learned how to thread almost every machine style we had at the factory. Later, I learned how each individual machine worked through sewing machine expert Griffen Cooper from Chainstitch Repair Company. I became very knowledgeable about the PUPPE's equipment and put my skills to use every day.

I became quite digitally savvy, as well. I had no choice but to learn how to operate the various platforms in which I logged our inventory, deliveries, shipments, and purchases. Every day I found a new and more efficient way to keep track of everything. In the beginning, the process of packaging and recording both mask orders and sew-at-home kits took at least an hour and a half. After about three weeks of work at the factory, I cut that time down to around forty-five minutes.

In mid-May, I made it through our order list and breathed a much-awaited sigh of relief. I couldn't believe I had completed what seemed a few weeks ago to be an impossible task. I had supplied all our customers with some form of protection and sent them home with valuable

information on how to sanitize and care for their masks. In the end, Midcoast Pop-Up filled 127 orders, 14% of which came from local businesses, 7% from healthcare workers, and 80% from community members. After looking over our numbers, I calculated that we had sent out 1,004 masks. 294 of these, or 29%, went to local businesses looking to open back up to the public while protecting their employees. 120 masks (12% of our total) went out to nurses, dentists, and other healthcare workers. 590 masks (59%) were sent home with local Maine families looking to protect themselves. Our final numbers were nothing like what we had originally expected. Michael Mullins founded Midcoast Pop-Up on the premise that we would be providing PPE to local hospitals. But as healthcare workers quickly acquired reusable masks from sewing groups throughout the state, their demand dropped off and was replaced by demand from small businesses throughout Maine. In May, the Mills Administration released a plan for slowly restarting Maine's economy in stages. Companies were allowed to reopen provided that "employers ensure workers wear cloth face coverings when appropriate." Businesses, both essential and non-essential, suddenly became desperate to acquire the appropriate protective equipment necessary to reopen. Through our production of PPE, we were able to help restart our local economy.

Midcoast Pop-Up PPE Factory and its movement is a perfect example of how communities can be truly self-sustainable. When our reliance on a foreign supplier of crucial medical equipment ran us into trouble, volunteers mobilized quickly. We created our own supply chain, pumping money into small businesses that offered us materials like Fiddlehead Artisan Supply in Belfast. With the help of our most valuable resource, volunteer labor, we were able to pump out thousands of products at a low cost. Then, we supplied those products to owners and

employees at small businesses, allowing them to reopen and generate income. We also provided protection for consumers. With adequate PPE, customers could resume buying from their favorite local businesses. We supported the stimulation of our local economy using the resources we had to work with.

Midcoast Pop-Up's operation is an example of true patriotism. When their community was in need, dozens of volunteers sprung into action. They collaborated, experimented, and created a solution to one of the most challenging problems that arose during the pandemic. I am beyond delighted to have met dedicated leaders like Michael, Shawn, and Karla who committed to working full-time at the factory in the interest of fixing a stalled and broken system. Activists and community organizers are capable of more than just spreading beliefs– we can make real change, especially in the face of a crisis.

Although the PUPPE is winding down production and our orders have slowed to a halt, I doubt our little team of superheroes will ever disconnect. Things will slowly return to normal as the covid-19 infection rate plateaus. We'll return to our former jobs. Although our lives will be forever changed by the pandemic, we'll be able to regain a sense of normalcy. But the Midcoast Pop-Up PPE Factory created an alliance of changemakers, and we'll be ready to step up and serve our community when the next crisis strikes.

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