

**THE CASE OF BOZEMAN HEALTH IN MONTANA:
RELATIONSHIP BUILDING WITH LOCAL SUPPLIERS TO
MITIGATE THE COVID-19 PANDEMIC CHALLENGE****AUTHORS**

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ABOUT BOZEMAN HEALTH

Bozeman Health is an integrated healthcare delivery system serving an eight-county region in Southwest Montana. As a nonprofit organization, governed by a volunteer community board of directors, Bozeman Health the largest private employer in Gallatin County, with more than 2,300 employees, including 250 medical providers representing 40 clinical specialties.

Bozeman Health includes two hospitals, Deaconess Hospital and Big Sky Medical Center. Bozeman Health Deaconess Hospital is an 86-bed Level II trauma center with general and specialty medicine, surgery, and a new 20-bed critical care unit opening August 2020 and a level 3 NICU opening fall 2020. A critical access hospital in Big Sky, Big Sky Medical Center has eight inpatient beds with emergency services, including a helistop for air ambulances, lab services, retail pharmacy, and a family medicine clinic. Bozeman Health Belgrade Clinic + UrgentCare offers family medicine, pediatrics, lab, diagnostic imaging, and urgent care services to the greater Belgrade communities. Other Bozeman Health care sites include Hillcrest Senior Living, b2 UrgentCare, b2 MicroCare, and b2 VirtualCare. Bozeman Health Neighborhood Care + Surgery Center opens in 2021 to better serve West Bozeman.

BOZEMAN HEALTH IN LOCAL PROVISIONS

The economy of Montana is based on agriculture, craft breweries, and nature tourism, with more than 10 million non-residents visiting Montana every year. With a population of 1.06 million, it is the 8th least populous state in the U.S. The population density is 7.09/sq. mi. or 2.73/sq. km. The western half of Montana contains numerous mountain ranges and, thus, is sparsely populated. The city of Bozeman has a population of around 50,000, but the encompassing Gallatin County has a population of 97,304, the third largest of all Montana's statistical areas (U.S. Census Website).¹

Bozeman Health plays a critical role in providing healthcare services to the region. As a nonprofit organization, it faces the challenge of maintaining a level of profitability through service offerings in order to remain financially viable to meet community needs. Bozeman

Health has strategic goals of financial sustainability, growth, development, efficiency, and accountability. However, the continued orientation towards community benefits, collaboration, and relationship development played a significant role during their response to the COVID-19 pandemic in Southwest Montana to mobilize local supply chain partners.

**COVID-19 INCIDENCE AND PREVALENCE IN GALLATIN
COUNTY: HOME OF BOZEMAN HEALTH**

Gallatin County received the first positive case of a COVID-19 patient (male in '40s with mild symptoms and good condition) on March 13, 2020². This was much later than many parts of the U.S. saw their first COVID patients. As per a press release on March 17, 2020, by Gallatin City-County Health Department, the second case was a male in his 20s returning to Montana from Europe on March 12 with symptoms. The person was in good condition and remained in his home. Subsequently, cases increased to reach to 76 by the end of March but remained flat between April to May in the tune of 135 to 151 total cases, and then increased in June to reach to 295 by the first week of July.

Immediate restrictions and closure of the bars and restaurants in the county followed, following the earlier recommendations from the U.S Centers for Disease Control and Prevention, that all Americans limit gatherings of 50 or more people. Around that time, the U.S had a nationwide effort in place to reduce disease spread through social distancing. The restrictions announced in Gallatin County and other Montana communities follow similar measures announced earlier in other parts of the country, such as in Illinois, California, New York, Ohio, Massachusetts, Michigan, and Washington. The county formed a call center, adopted several other restrictions, and kept tracking, monitoring, and notifying the public about COVID updates as the numbers of patients kept rising through March to July 2020. However, there were only six hospitalizations, and one death—and most of the patients recovered from COVID.

Thus, Gallatin county did not face the ire of COVID in its worst sense; however, the fear and panic were prevalent that it might spread any time. The challenge was not imminent but remained as a 'watch and be prepared' scenario when it comes to managing Bozeman Health facilities and hospitals.

**CHALLENGES FACED BY BOZEMAN HEALTH DURING THE
COVID-19 CRISIS**

Bozeman Health's approach to the situation was very proactive. At the outset, the health system quickly implemented their emergency preparedness plan and stood

¹https://www.census.gov/newsroom/releases/archives/201_census/cb11-cn85.html

² <https://www.healthygallatin.org/coronavirus-covid-19/>

up their incident command, utilizing best practices from FEMA's Hospital Incident Command System (HICS), headed by Kallie Kujawa, Bozeman Health's system director of quality and safety, and the incident command lead. This led the organization to take fast and just-in-time decisions to tackle many issues and challenges. Although the incidence and prevalence of COVID-19 were not that high, by the first week of April, Bozeman Health was prepared to manage a possible peak of more than 100 hospitalized patients, if the need were to develop higher capacity³. Underlying this readiness was strong collaboration and partnership Bozeman Health has with the Gallatin City-County Health Department, the City of Bozeman, Gallatin County, Montana State University, and other industry experts.

THE SURGE PLAN

A set of decisions early on helped Bozeman Health to continue its activities seamlessly. The objective was to remain prepared to provide care to the community during the COVID-19 pandemic. An early projection, based on data and analysis available around the end of March 2020, Bozeman Health expected a worsening COVID peak situation in that around the end of April. Leaders within Bozeman Health collaborated with industry experts and academic organizations and projected both short- and long- term scenarios for COVID-19, along with continuous tracking and monitoring of the epidemiological trends in Montana and other rural states.

Subsequent to the projections, operationally, Bozeman Health implemented a 'surge plan' that would allow for the daily inpatient volume growth rate until the peak is reached⁴. The plan accounted for an eight week (April-June) coverage timeframe, including locally available testing capability, expansion of infrastructure, bed count, supplies and equipment, , and staffing needs to manage the required inpatient care at Bozeman Health hospitals. Moreover, the plan for the significant increase in the inpatients was also aligned with the availability of staff with a model in place that determined the number of nurses, physicians, respiratory therapists, nurse aides, and environmental and nutrition services team members needed to care for the anticipated number of inpatients.

The anticipation was around 100 COVID-19 positive patients to be under active care at Bozeman Health hospitals, 83 of them being medical floor inpatient admissions in Bozeman or Big Sky, and 17 of them being ICU admissions. During the same week, they also anticipated continuing to provide expert, quality inpatient care to approximately 28

individuals with non-COVID-19 related conditions at both Deaconess Hospital and Big Sky Medical Center. This is in contrast with the earlier 86 beds at Bozeman Deaconess Hospital, with eight inpatient beds at Big Sky Medical Center. They decided to expand the inpatient capacity to meet the need to serve approximately 128 non-COVID-19 and COVID-19 patients by utilizing bed space within the post-acute care unit (PACU), Peri-Op, endocrinology and interventional radiology patient care areas at Deaconess Hospital for an increase of 38 beds.

The surge plan included keeping respiratory/viral infection patients physically separated within different units than non-respiratory/non-viral patients requiring acute hospital care. Patients at Big Sky Medical Center requiring intensive care were planned to be transferred to Deaconess Hospital.

However, the situation never reached this dire state, thanks to the social distancing and other similar measures in place; as of the end of June, the situation in Bozeman Health is quite good. In retrospect and reflecting on the COVID situation from March to June 2020, three challenges are highlighted for Bozeman Health during the crisis: (1) predictive readiness to balance the supply and demand of personal protection equipment (PPEs), (2) the processes and complexities to manage testing sites, and (3) the emerging operational challenge of adapting facilities to care for COVID while attempting to reopen.

EQUIPMENT SUPPLIES BY LOCAL MANUFACTURERS

Bozeman Health encountered difficulty being equipped with necessary PPE for airborne and droplet threats. Procuring supplies and equipment became a challenge. As the COVID situation was escalating across the U.S., the Centers for Disease Control and Prevention provided guidelines to manage and optimize the supply of PPE and equipment⁵. The objective was to maintain sufficient stock of PPE and medical supplies consistent with the healthcare capabilities of the facility and have a plan in place to restock as needed if COVID-19 transmission escalated beyond expectations. Much of the recommended PPEs included facemasks, N95 respirators, eye protection, disposable medical gloves, and disposable gowns and one-piece coveralls⁶.

Bozeman Health predicted that there would be challenges around gown and mask supplies if the patient admits increases. They asked local organizations to come forward and help to manufacture PPE for the health system.

³ <https://www.bozemanhealth.org/news/releases/bozeman-health-readies-for-surge-of-covid-19-inpatients/>

⁴ <https://www.bozemanhealth.org/news/releases/bozeman-health-readies-for-surge-of-covid-19-inpatients/>

⁵ <https://www.cdc.gov/coronavirus/2019-ncov/hcp/ppe-strategy/index.html>

⁶ <https://www.cdc.gov/hai/prevent/ppe.html>

The community was ready to help. Individuals and companies reached out and wanted to support and to offer donated items. Local specialists were involved in designing items. There were so many calls of offers from community members that the health system assigned a staff member to field these calls on a fulltime basis.

DOCTOR AND STAFF WEARING LOCALLY MANUFACTURED GOWNS



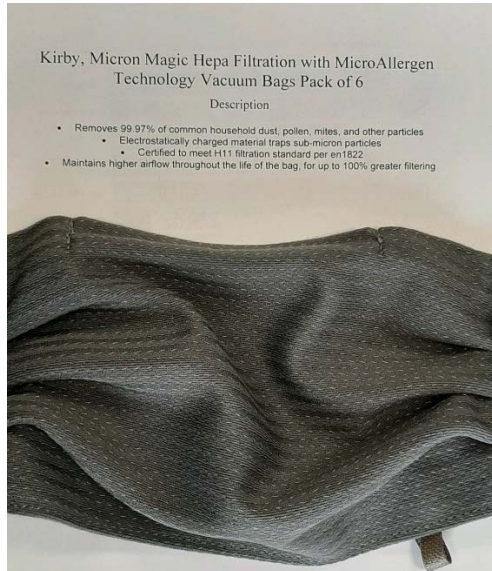
Local community groups, such as the Montana Masks for Heroes, provided handmade fabric masks to Bozeman Health. Other local companies such as Montana Masks for Heroes, Mystery Ranch, and West Paw⁷ came forward to help fulfill clinical masks and other PPE. Face covering prototypes were produced in collaboration with a local backpack company—the Mystery Ranch after the Infection prevention specialists at Bozeman Health created the design.

They also developed an adapted use of vacuum high-efficiency particulate air (HEPA) filters to use as filtration in locally manufactured masks for clinical staff in buildings.

A local firm, Bridger Aerospace and Vision Ascent Technologies, agreed to design, develop, test, and produce face shields. A set of injection-molded respirator masks were tested to be available by a local small engineering company, 4M R&D, specialized in design, development, and production of outdoor sports and other equipment⁸.

Local fishing products company, Simms Fishing Products, answered the call to begin manufacturing medical gowns in collaboration with Bozeman Health⁹ ¹⁰. As reported, “Simms delivered almost 300 gowns and powered

LOCALLY MANUFACTURED PPE



⁷ <https://www.bozemanhealth.org/news/releases/bozeman-health-readies-for-surge-of-covid-19-inpatients/>

⁸ <https://www.bozemanhealth.org/news/releases/bozeman-health-readies-for-surge-of-covid-19-inpatients/>

⁹ <https://www.kbzk.com/news/local-news/simms-wader-makers-to-make-medical-gowns-for-bozeman-health-medical-group>

¹⁰ https://www.bozemandailychronicle.com/coronavirus/bozeman-area-businesses-making-medical-gowns-masks-for-hospital/article_07995953-f87b-50be-884f-59916e174758.html

air-purifying respirator (PAPR) hoods to Bozeman Health Deaconess Hospital, with the first delivery on April 3, and has continued production to fill confirmed orders totaling 4,000 or more”¹¹.

The challenge for Bozeman Health was to maintain a sufficient supply and possibly ready supply chain partners to help in case of need. As soon as the COVID situation reached a threshold, the global supply partners could not meet the demand. Across the U.S., the critical supply shortages for PPE became imminent.¹² This was concerning for Bozeman Health, as their financial leverage and geographic location did not provide them much ability to source from alternate global supply partners.

The existing community relationships of Bozeman helped find innovative solutions and emerged to adapt to the situation. Kallie Kujawa commented that “we are extremely lucky here: local organizations have been of so much help to us.”

Along with local sourcing, it was also a challenge to keep up the stringent standards and quality benchmarks. Bozeman Health collaborated with State universities to test the prototypes and vet on the quality benchmarks. The university system helped with testing these prototypes to ensure functionality and effectiveness. Amongst other appropriate actions, Bozeman Health instituted reuse policies and sterilization practices for PPE that can be reused and cleaned and/or sterilized.

Although ventilator supply is seen as a challenge to hospitals managing increasing COVID patients, that was not the case for Bozeman Health. When non-essential services were temporarily closed or moved to telehealth appointments, Bozeman Health had a contingency plan to reallocate their anesthesia machines. Bozeman Health had existing ventilators in its ICU at Deaconess Hospital and had ordered more in 2019 in anticipation of its new critical care unit opening in 2020. The generous support from local donors, along with the early ordering of more allowed Bozeman Health, to more than double its ventilator and anesthesia machine capacity.

THE CHALLENGE OF AVAILABILITY OF TESTING KITS

COVID-19 testing is a necessity to identify incidences. Limited availability of testing kits was a concern for Bozeman Health. Again, rather than purchasing costly testing kits and equipment from global supply sources, Bozeman Health relied on the local community such as universities, to help increase test turnaround times that would

allow Bozeman Health to conserve PPE by doing testing pre-procedure.

Montana State University allowed the temporary transfer of its quantitative PCR (Polymerase Chain Reaction) machine to the Deaconess Hospital lab to attempt on-site testing for the SARS-CoV-2 virus. A qPCR machine is a compact one that acts as a molecular photocopier, amplifying the unique molecular composition of the virus to facilitate the testing of patient samples. Several university researchers and scientists contributed their time and worked with Bozeman Health’s clinical lab specialists to validate the qPCR machine’s capabilities and calibration, and subsequently used the testing facilities. The collaboration with Montana State University helped by loaning analyzers and gained approval for in-house testing—along with the continued in-house COVID equipment available at Deaconess Hospital. Doing both in-house testing and sending it to an external site to maximize the use of available resources helped Bozeman Health to expand and leverage testing to involve surveillance for community public health purposes.

As of July, Bozeman Health has enough testing capacity for diagnostic purposes but is unable to test at the optimum level to monitor community spread. Testing capabilities remain limited due to a shortage of testing reagents. A priority of these tests is the frontline healthcare teams and community first responders so that Bozeman Health, in collaboration with public health, can protect the safety and health of our workforce. Second, Bozeman Health is conducting tests for inpatients at Deaconess Hospital or Big Sky Medical Center who meet the testing guidelines so that their clinical care teams can remain safe and provide the appropriate care and treatment of those patients. They are secondarily conducting on-site testing for pre-operative patients and for inpatients as needed to conserve PPE, protect the workforce, and inform treatment decisions. As more analyzers, testing supplies, and reagents become available, Bozeman Health hopes to expand testing to the community for those who are meeting guidelines, both scope and scale-wise.

Overall, Bozeman Health’s endeavor to collaborate locally for the testing equipment, staff, and opportunities enabled protecting safety and health of the workforce, prepared for the surge of local COVID-19 positive patients, and supported the efforts of Gallatin City-County Health Department and the community

¹¹ Simms delivered almost 300 gowns to the Bozeman Health Deaconess Hospital, with the first delivery on April 3, and has continued production to fill confirmed orders totaling 4,000 more.

¹² <https://www.nejm.org/doi/full/10.1056/NEJMp2006141>

ADAPTING TO REOPEN CHALLENGES

Bozeman Health's challenges are far from over. Bozeman Health's efforts to expand testing to frontline healthcare workers and first responders, while ensuring that the local community retains the needed workforce to care for current and future patients (with COVID and non-COVID concerns) remains a concern. There is a need to alter operations to meet the needs created by COVID while creating revenue and preserving jobs. Bozeman Health is actively continuing efforts and awareness of developments around COVID. They are still seeing the lowered supply situation and facing the continued supply chain disruptions.

Kallie Kujawa has several concerns that she mentioned during the interview: "Clinical care providers, support services, and our leadership teams have worked around the clock to ensure the safety and continuity of providing excellent, quality care to all patients during this time. We recognize that our staff and providers are tired and anxious about how long this pandemic may last. We have been lucky to retain all positions within the health system, especially when other health systems throughout the nation are facing the elimination of hundreds of positions due to elective services being postponed or canceled. We continue to evaluate the safety and effectiveness of all our PPE to help alleviate staff concerns and acknowledge that reusable PPE is not always ideal."

It is challenging to maintain heightened needs while reopening normal operations. Cases are climbing pretty steeply again, around July. Many people are symptomatic; the COVID call center is inundated with people calling, cars are backed up at the testing sites. The staff that had been redeployed to help staff COVID-19 triage and testing sites have gone back to their regular roles, and it is challenging to maintain staffing at Bozeman Health's COVID-19 specific care sites.

Reflecting on the time and efforts spent on COVID, Kujawa notes: "Specimen collection for COVID-19 is burdensome due to limited supply of test kits and the size of our analyzers. We are grateful to the state health lab for processing the majority of COVID-19 tests and continue to see how we can assist in helping make the process easier and less cumbersome."

"Our employees have pulled together really quickly in a way we could never have anticipated. Everyone was proud of our response efforts. Shutting down the majority of our operations was feasible for our ambulatory clinics because they were able to switch to telehealth. Physicians/surgeons were also very on board with canceling procedures. When it was safe to reopen, and when we were experiencing financial concerns, they all came together to create a reopening plan.

We are calm and managing while continuously monitoring the situation."

CONCLUSION

Bozeman Health was the first to care for a COVID-19 Person Under Investigation inpatient in Montana, and so had resources from around the state, and this was an advantage.. The test came back 5 days later from the federal CDC lab confirming this patient was negative. Bozeman Health's journey since then has been quite engaging. Other hospitals loaned PPE and design procedures. The first case was in March, and it provided everyone a reality check – Montana is not immune from this global crisis. However, the global crisis needed local adaptive solutions, rather than waiting for the already-disrupted global supply chain around equipment and supplies. Indeed, Bozeman Health turned it around, to go local from global, at a time when the crisis was expected to hit the most!

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