

Fishing in the time of COVID: Assessing risk in the Bristol Bay commercial salmon fishery and the societal benefits of social science research

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Around 13,000 people from outside Alaska arrive each summer in the Bristol Bay region of Western Alaska to participate in the world's most valuable wild salmon fishery. The small regional hub community of Dillingham is the home port of the Nushagak River salmon fishery. The National Science Foundation funded a RAPID project to assess planning needs for the fishery, community, and region. Our project developed pandemic preparedness scenarios for local residents and decision-makers through online surveys to better understand the costs and benefits of varied mitigation policies; and risk preferences from fishers, processors, local residents, and local decision-makers to better understand cooperation and decisions under risk and uncertainty.

Our project administered an online survey to identify risk perceptions, responses to policy, and compliance. Our first survey was administered in the summer of 2020, and we received 926 valid responses (Smith et al. 2023). To further understand the benefits of the survey to the community, we conducted in-person qualitative interviews in May 2022 with 10 Bristol Bay area fishery participants, fishery operators, and decision-makers. This short article will focus less on the data produced through this survey and more on how the results were useful for the City of Dillingham (City) in planning mitigation strategies for processors and captains. In Alaska, every fishing boat

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is a business. In 2020, every captain had to have a mitigation plan for their crew, and fishing operations and processors also had strict mitigation measures. Their workers could not leave the campus, and visitors were not allowed. As one fish processing manager said, “I didn’t manage a fishery in 2020; I managed COVID.”

In 2020, before the survey, the City implemented a travel permit system to monitor every individual arriving in the community and document their COVID-19 mitigation plan. This permit system was overwhelming for the city government to manage. They had a full-time staff member to administer the permit tracking system, and several other City employees assisted. One captain who has two fishing boats and a tender shared how in the summer of 2020, every time a new crew member arrived, they had to start over with quarantine. This occurred a total of six times over the summer. As a community member with many family members, including elders, he was cautious, and the constant vigilance gave him a great deal of anxiety. For most of the 2020 season, he did not visit elders in his family. While delivering fish, he stayed on the boat to ensure he did not come into contact with anyone. Another fisher related how when they arrived at a dock, instead of roping up to other boats passing lines across, they would only handle their own lines. The captains we spoke with knew of fishers who decided to sit out the fishery in 2020.

Survey results support this, as two-thirds of respondents knew someone who decided to sit out the fishing season. However, data shows that in 2019 there were a total of 1,605 permits fished, and this only dropped to 1,521 in 2020. As noted, each fishing boat is a business, and fishers had to weigh the cost versus revenue. In 2019, for example, the average gross revenue was \$173,571, while in 2020, due to the drop in salmon consumption with so many shuttered restaurants that often feature fresh Bristol Bay salmon, the average gross dropped to \$113,625 (CFEC 2021; Tiernan et al. 2021). Fishing revenues, though, were supplemented through the COVID-19 relief Paycheck Protection Program (PPP) and grants from the Bristol Bay Native Corporation through the Cares Act. However, PPP funding was only available to captains who had three years of business records. As a result, some felt the pressure to fish to ensure they continued to make boat and permit payments, adding additional anxiety.

Fish processing plants closed their campuses in 2020. One operator said they were only able to operate as their workforce was already in Alaska at other locations. They were able to move workers around and Bristol Bay operated at 50% capacity in 2020. In 2021, they were back to normal capacity. Processors often open their cafeterias to fishers and provide coffee while fish is being delivered as a courtesy to captains who choose to work with them. In 2020, they were unable to allow fishers to enter their facilities. Overall, the closed campuses worked. One processor related how they only had 3-4 positive COVID-19 tests in 2020, and they were only caught during random testing, and those infected were not sick. One of the advantages of the mitigation measures is that stricter hygiene and cleaning procedures led to fewer sick days. They intend to continue and improve upon these measures. The processors did not like the strict mitigation measures put into place by the City in 2020. However, they did learn from these mitigations, and in 2021 they maintained the closed campus.

We provided data that for the 2020 fishing season showed strong support for quarantine periods, testing, use of masks and social distancing, closed campuses, and other mitigation measures put into effect. The COVID-19 tracking system was not favorable and was burdensome for the City to administer. For the 2021 season, the City used findings from the survey to understand risk and

mitigation preferences to implement mitigation measures instead of continuing with the permit system, with a resultant major reduction in staff time and cost. During the interviews, we learned that in 2021 due to fewer restrictions and paperwork required by the City, captains were under significantly less stress and could focus more on their operations.

With feedback from Dillingham decision-makers on data needs that would benefit their mitigation measures, we administered two additional surveys in the spring of 2021 to our original respondents to understand vaccine participation and hesitancy. Just over 90% of respondents participated again. We found that almost half of the respondents were not vaccinated before the fishing season. Still, in a third survey administered mid-season in 2021, about 40% of unvaccinated respondents had decided to get the vaccine, often due to work requirements.

One captain left it up to his crew to choose whether to get the vaccine. He said that if they refused, then they were required to wear a mask. Most complied and got the vaccine. In addition, they maintained distance when delivering fish. Another captain noted they would not tie up to other boats while delivering fish. If they had to get off the boat, they would wear masks and maintain distance. Processors highly encouraged workers to be vaccinated. One processor said their staff and workers had 90% vaccination compliance. It was understood that you could refuse to be vaccinated, but that would jeopardize your chances of being hired. Some processors required proof of vaccination for fishers to enter their property.

In conversations with City officials, they related that the data provided by the State of Alaska was useless, especially in 2021. Most people were home testing, and without accurate COVID-19 rates, they could not determine when to recommend additional mitigation measures, so they relied on tracking COVID-19 rates in the schools. This uncertainty with COVID-19 rates during the winter meant they would not have good data during the summer fishing season. To share information, the City organized a weekly informal meeting with entities in the community, including the school, hospital, Tribes, and others. This sharing of information provided the data they needed to monitor the situation in the fishery. This allowed them to track COVID-19 rates jointly. In 2022, the City chose not to establish mitigation measures, leaving it to companies and captains to monitor themselves and set their own rules. Overall, fishers and processors took the pandemic seriously. A sick crew cannot fish, and a sick workforce in the processing sector cannot keep up with supply, leading to a loss of revenue during a short period of time when fishing occurs each summer. The City said it would be business as usual in 2022, but not the same as three years ago; it will be business as usual in a new era.

Finally, with 2022 as a normal year, the City is considering how to move forward for the people they serve. As noted above, there was much anxiety among fishers, processors, and community members. The City would like to find ways to address mental health. The takeaway is that the City had to work with others locally to monitor the COVID-19 situation. They could not rely on data provided by the State of Alaska. Local data collected through this project provided the City of Dillingham with what was needed to verify compliance by fishers and processors in the Bristol Bay fishery.

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