

Background and Context

COVID-19 is a highly contagious, airborne disease. The pandemic is ongoing, with new waves emerging every 6-9 months. These waves are driven by a combination of new Variants of Concern (VoCs) and behavioral factors. Winter appears to be a particularly high-risk time due to seasonal and behavioral factors (e.g., decreased temperature, low humidity, holiday socializing, increased time spent indoors). Conversely, the Spring and Summer have had relatively lower rates of transmission in 2020, 2021, and 2022, with the notable exception of a surge driven by the Delta variant in the late Fall/early Summer of 2021, and a possible oncoming wave in Summer 2022 that appears to be largely driven by the BA.2 variant.

Vaccines significantly decrease symptomatic infection, hospitalization, and death and have dramatically reshaped the risk calculus of the pandemic, although emerging evidence suggests that the effectiveness of a third booster may wane significantly within 10 weeks^{1 2}. Multiple brands of COVID-19 vaccines are now widely available to individuals who have access to healthcare and there have been high levels of uptake in communities that have been historically well treated by healthcare providers. However, racialized communities with ongoing experiences of medical and institutional mistreatment have been less likely to access COVID-19 vaccines. In San Diego County, 44% of White residents are vaccinated with a booster, compared to 29% of Hispanic/Latino residents and 25% of African American or Black residents. These vaccine statistics are reflected in case data: Between January and April of 2022, Hispanic residents were 1.3 times more likely to be diagnosed with COVID-19, 2.8 times more likely to be hospitalized, and 3.4 times more likely to die from a COVID-19 infection compared to White residents³.

While research on long covid is ongoing, the CDC estimates that somewhere between 10%-30% of people who contract COVID-19 will develop long covid⁴, regardless of the severity of the initial infection⁵. Long covid consists of a range of symptoms that occur within three months of a previous COVID-9 infection, with symptoms lasting at least one month. Vaccines do decrease the probability and severity of long covid⁶, although there is not currently a consensus as to the exact degree of protection that vaccines can provide. There is some indication that women ages 40-60 may be at the highest risk of experiencing long covid⁷, although the mechanisms are not clear. In addition to severe pulmonary and cardiovascular symptoms, long covid has also been associated with neurological and cognitive effects: One rigorous study of brain scans conducted before and after COVID-19 infection found that an infection was associated with significant cognitive decline and an overall decrease in brain size among individuals ages 51 - 80. These

¹ <https://www.nature.com/articles/d41586-022-00200-9>

² https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1043807/technical-briefing-33.pdf

³ <https://www.sandiegocounty.gov/content/dam/sdc/hhsa/programs/phs/Epidemiology/COVID-19%20Watch.pdf>

⁴ <https://www.cdc.gov/coronavirus/2019-ncov/long-term-effects/index.html>

⁵ [https://www.who.int/news-room/questions-and-answers/item/coronavirus-disease-\(covid-19\)-post-covid-19-condition](https://www.who.int/news-room/questions-and-answers/item/coronavirus-disease-(covid-19)-post-covid-19-condition)

⁶ <https://www.ama-assn.org/delivering-care/public-health/what-doctors-wish-patients-knew-about-long-covid>

⁷ <https://www.nature.com/articles/s41591-021-01292-y>

results were consistent regardless of disease severity (i.e., whether or not a patient was hospitalized)⁸.

As of May 2022, no vaccine has yet received FDA approval for children under the age of 5. A recent population-level study from the New York Department of Public Health suggests that the dose authorized for children ages 5-11 may not be adequate to prevent symptomatic infection against the most recent omicron variant⁹.

Because COVID-19 is airborne and highly infectious, it is important for institutions to implement mitigation strategies using a public health lens rather than an individual medical framework. Public health responses are most successful when they consider possible interventions at the level of institutions, communities, and relationships, rather than relying solely on the prospect of individual behavior change. Within the context of a Unitarian Universalist community, our public health response to COVID-19 includes consideration of our shared principles, particularly our call to justice, equity, and compassion, and respect for our place within an interdependent web of life. The First Unitarian Universalist Congregation of San Diego has also voted to affirm the 8th principle, in which we covenant to promote a journey towards spiritual wholeness [through actions that] accountably dismantle racism and other oppressions in ourselves and our institutions.

In April of 2022 the reopening team of the First Unitarian Universalist Church of San Diego commissioned a congregational survey to assess communal priorities and risk as the COVID-19 pandemic entered its third year. Staff conducted a concurrent assessment of the ventilation systems in the Hillcrest and South Bay campuses to understand indoor built environment strengths and weaknesses. This document reports on these two exercises and provides recommendations in line with best public health practices and our spiritual principles.

Congregational survey

The reopening team created and distributed a brief online survey using Qualtrics software. The survey was piloted with a diverse set of First UU members and friends and modified based on feedback to ensure clarity and completeness. (Instrument available in Appendix A). A survey link was shared in the weekly church newsletter, via an email listserv (eblast), and in social media posts. We made extra attempts to reach out to parents and members of the South Bay congregation to ensure that their perspective was represented. The survey was available from April 14 - April 27, 2022. Typically 80-120 individuals attend Hillcrest services in person and an additional 50 attend online, while South Bay had an average weekly attendance of approximately 40 people before the pandemic.

⁸ <https://www.nature.com/articles/s41586-022-04569-5>

⁹ <https://www.medrxiv.org/content/10.1101/2022.02.25.22271454v1>

Demographics

A total of 239 individuals completed at least 90% of the survey. Eighty-eight percent of congregants reported solely attending the Hillcrest campus, while 12% (n=29) reported attending South Bay. Twenty-three parents responded. Participant ages ranged from 25 - 95, with a mean age of 67. The large majority of respondents were white (89%), 58% were female, 3% were non-binary/third gender, and 33% were male.

	HILLCREST	SOUTH BAY	ALL
Age (mean)	255 66.8	37 67.5	292 66.9
Live with children	11% (23)	3% (1)	10% (24)
Gender			
Male	34% (70)	27% (8)	33% (78)
Female	60% (122)	57% (17)	60% (139)
Non-binary / third gender	3% (7)	0	3% (7)
Race			
Asian	1% (1)	0	1% (1)
Black / African American	2% (4)	0	2% (4)
Hispanic	2% (3)	11% (3)	3% (6)
White	90% (180)	86% (24)	89% (204)
Multiracial	7% (13)	4% (1)	6% (14)
Vaccination status			
Not vaccinated	1% (2)	0	1% (2)
Vaccinated	3% (7)	3% (1)	3% (8)
Vaccinated + 1 booster	62% (132)	65% (20)	62% (152)
Vaccinated + 2 boosters	34% (73)	32% (10)	34% (83)
Household vaccination status			
Not all HH members vaccinated	2% (4)	0	2% (4)
All HH members vaccinated	8% (13)	0	7% (13)
All HH members vaccinated + boosted	90% (147)	100%	91% (172)
Self-reported high risk (yes/maybe)	46% (95)	43% (13)	45% (108)
Household member high risk (yes/maybe)	23% (48)	47% (14)	26% (62)

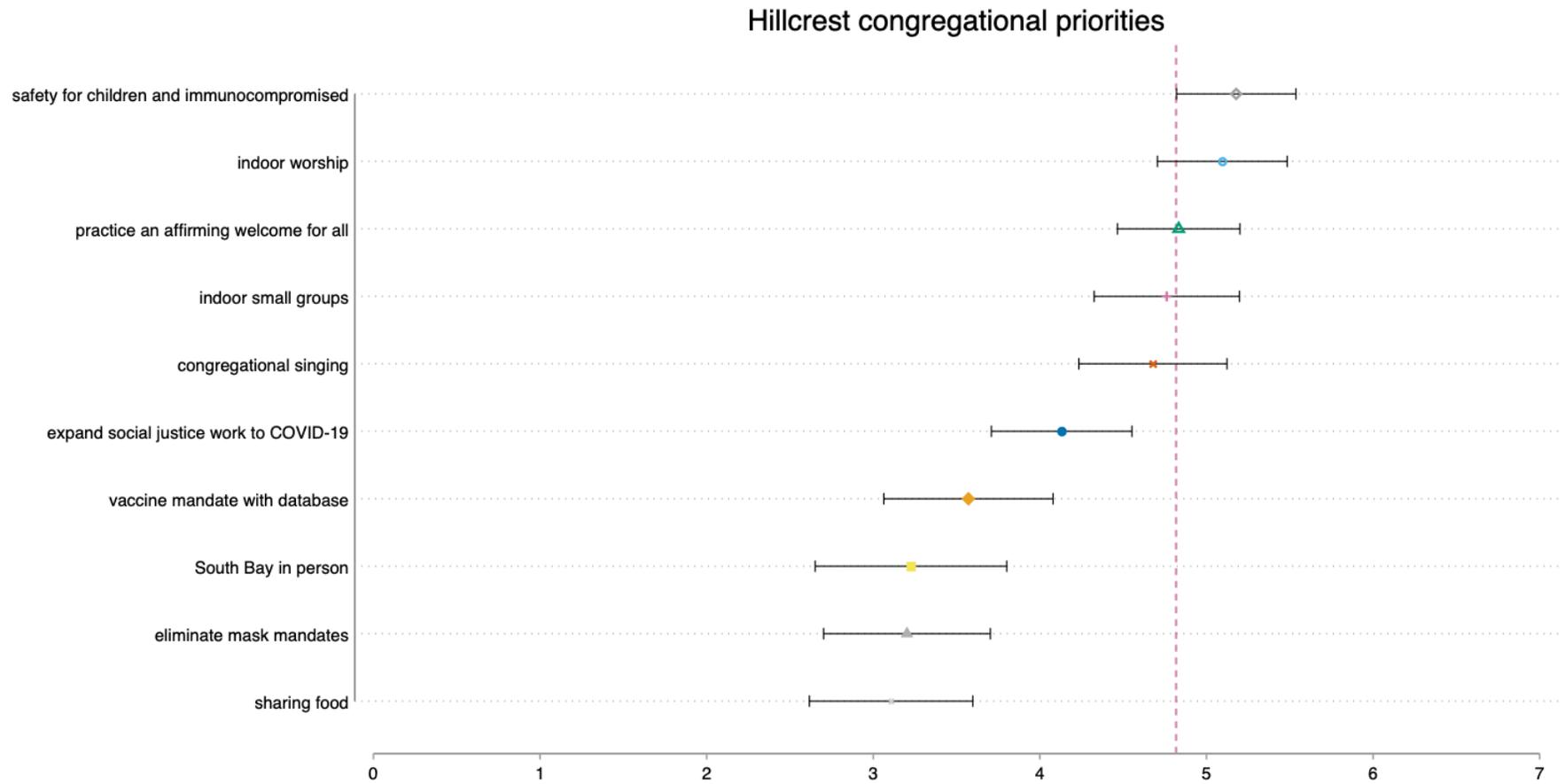
All but 2 survey respondents reported being vaccinated. Ninety-five percent of respondents were vaccinated and boosted with either 1 booster (62%) or 2 boosters (33%). Seventy-one percent of respondents indicated that all their household members were vaccinated and boosted. Just under half (45%) of those who took the survey self-reported that they were at high risk for COVID-19 or were “maybe” at high risk.

Priorities

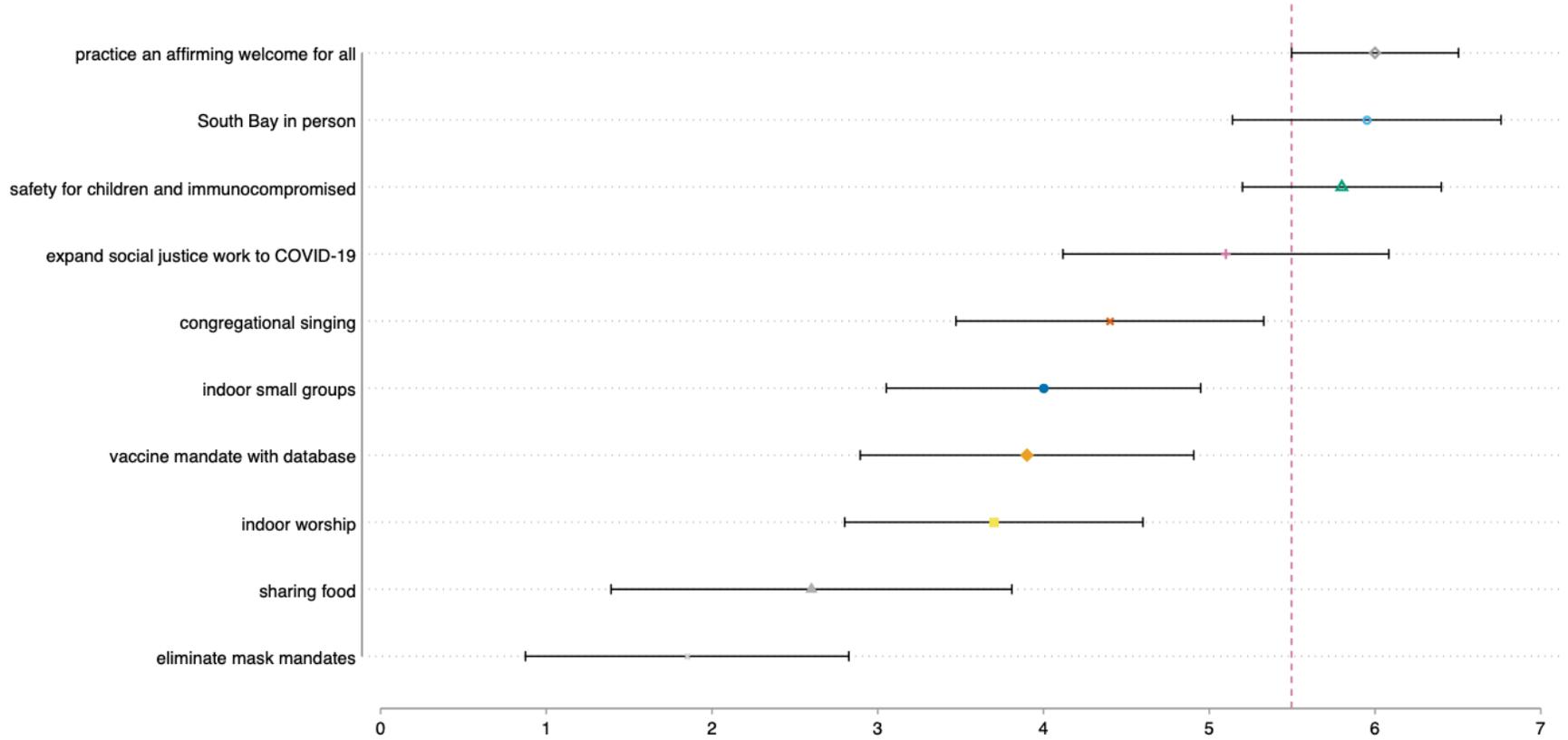
Survey respondents were asked to rank a list of potential priorities for First UU Church on a scale of 1 - 7, with 7 being an extremely high priority and 1 being an extremely low priority. Priorities differed markedly across the Hillcrest and South Bay congregations (Figures 1 and 2, respectively). Both congregations rated “Practicing an affirming welcome for vulnerable community members” and “Safety for children under 5 and the immunocompromised” as the highest priority. Eliminating mask mandates was the lowest priority for South Bay, and among the lowest priorities for Hillcrest.

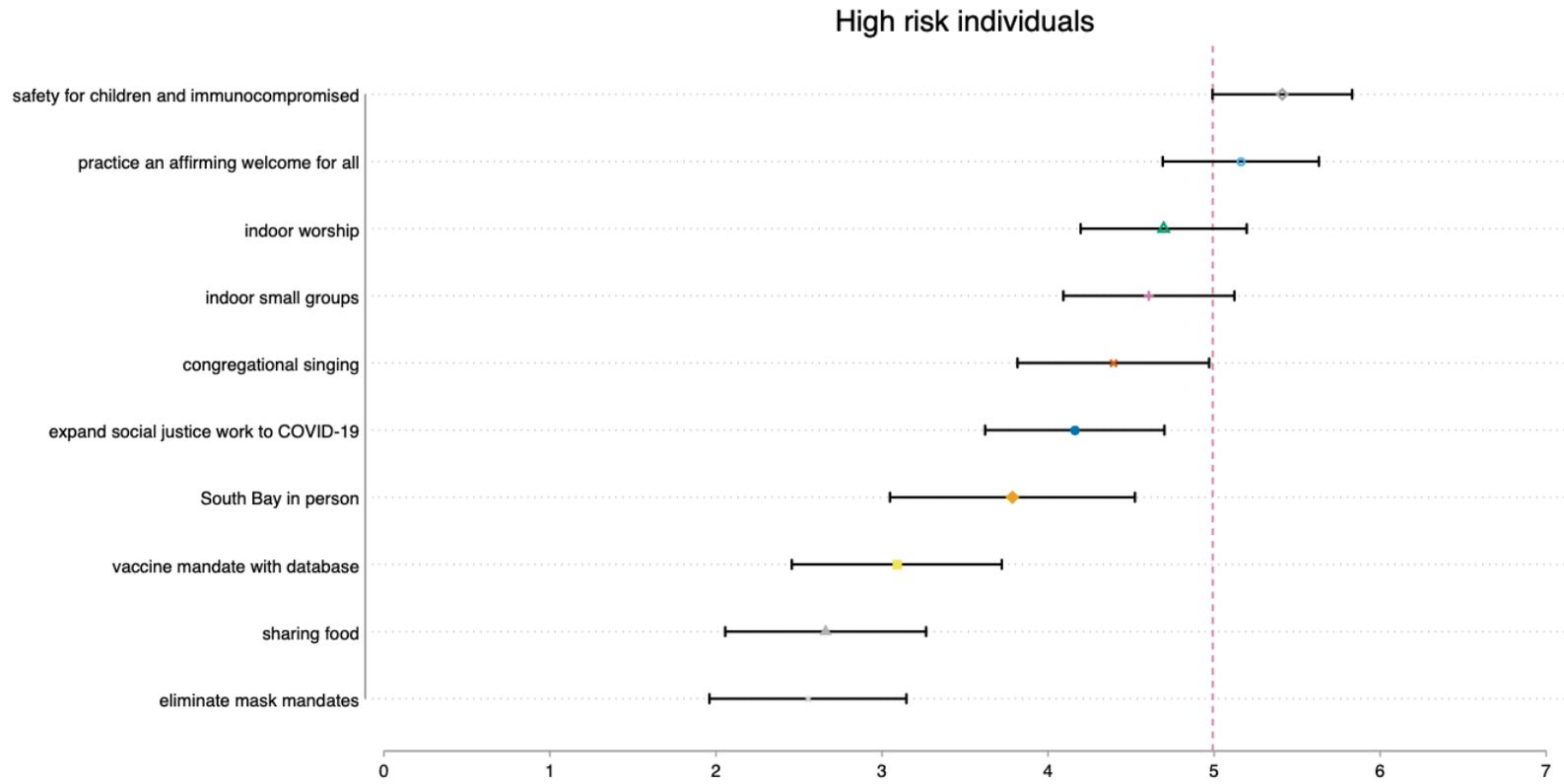
In Hillcrest, the top 5 priorities are safety for the immunocompromised and children under 5, indoor worship, practicing an affirming welcome for all, indoor small groups, and congregational singing. The South Bay congregation prioritized practicing an affirming welcome for all, reopening the South Bay campus, safety for children and the immunocompromised, and expanding social justice work to include COVID-19.

High risk community members had similar priorities across both communities. Notably, eliminating the mask mandate was the lowest priority for those at the highest risk



Southbay congregational priorities

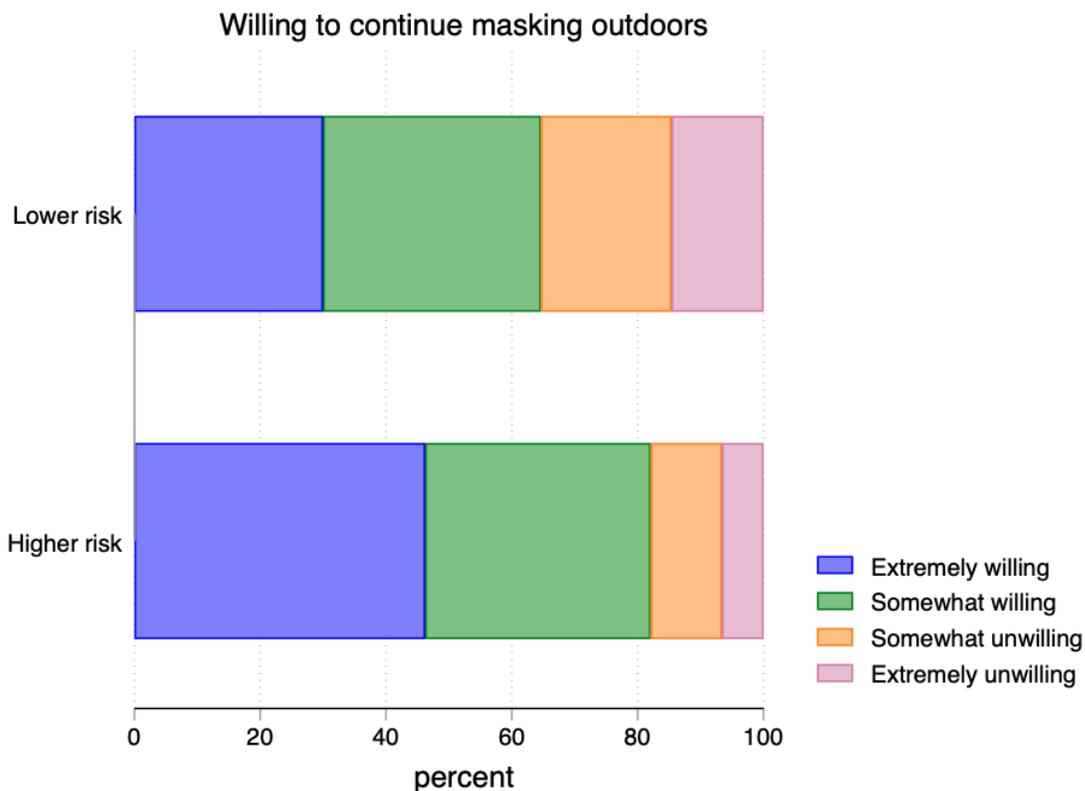




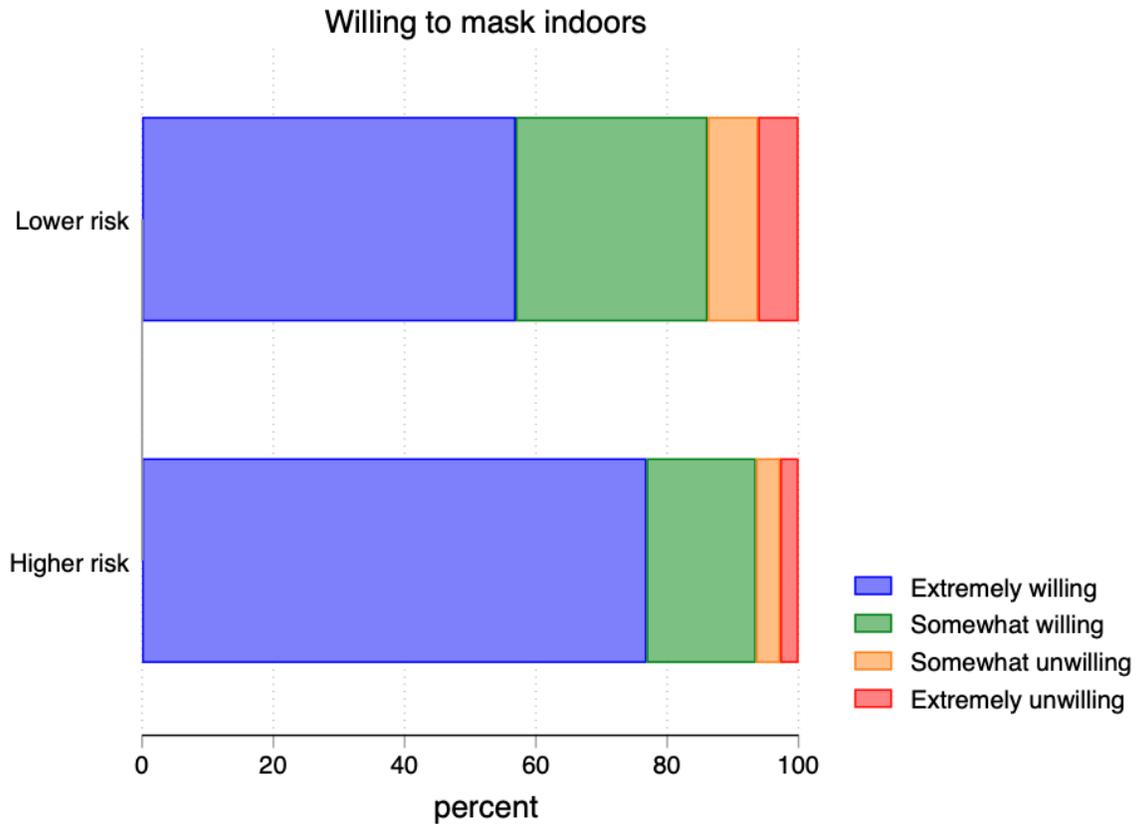
Risk mitigation strategies

Congregants were asked to share their preferences regarding different risk mitigation strategies: Attending church online, masking indoors and outdoors, regular testing, and participating in a vaccine registry. Thirty-eight percent of respondents said that even when in-person service is available they would be extremely (17%) or somewhat (21%) likely to continue attending worship online. The most significant predictor of preferring online services is age. Congregants ages 71 and older were six times more likely to report that they would likely continue attending services online compared to participants 45 or younger. After adjusting for age, neither primarily attending services in South Bay nor personal risk perception were significantly associated with preferring online services.

Overall, 72% of congregants reported that they were willing to continue masking outdoors. The numbers were slightly higher in South Bay (82%) than Hillcrest (71%), but the difference was not statistically significant. Not surprisingly, an even higher percentage of individuals were willing to mask indoors, with 90% across all campuses (88% Hillcrest, 96% South Bay). The vast majority of individuals also felt that it was extremely, very, or moderately important that other people continue to mask in indoor spaces (90% South Bay, 77% Hillcrest), and about 50% felt that it was extremely, very, or moderately important that others continue to mask outdoors as well (48% Hillcrest, 64% South Bay).



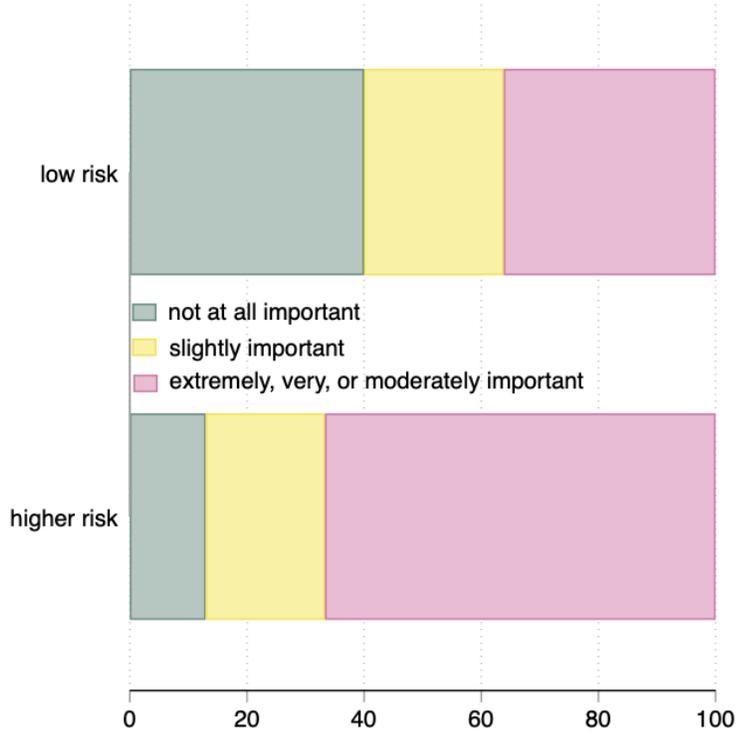
People who considered themselves to be at high risk were significantly more willing to mask both indoors and outdoors. After adjusting for perceived self-risk and age, the only other predictor of willingness to mask was gender, with men rating themselves as significantly less willing to mask outdoors compared to women ($p = 0.003$).



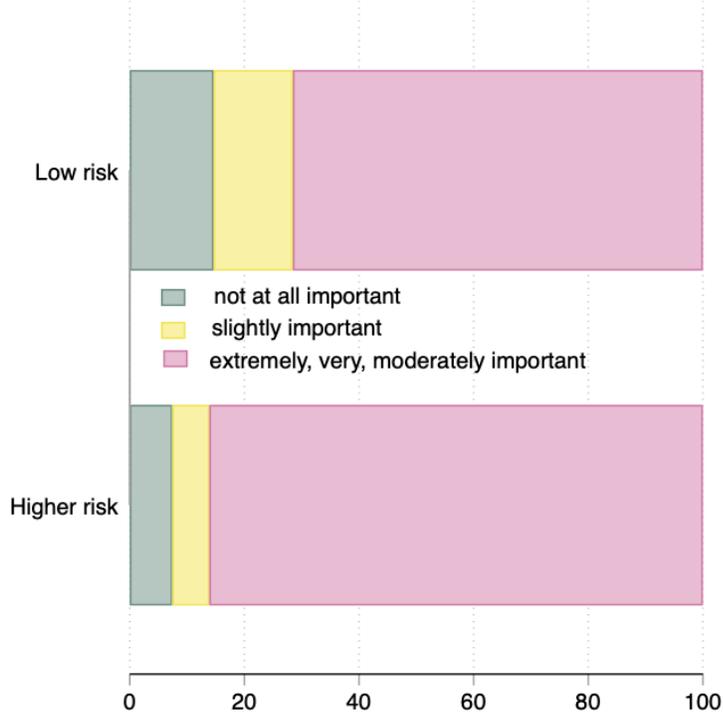
Higher risk individuals were almost twice as likely to categorize other people's masking behaviors outdoors as extremely, very, or moderately important (67%) compared to individuals who do not consider themselves to be at high risk (36%).

Just over 40% of survey respondents said that they would be somewhat or extremely likely to access a COVID-19 test if one was offered during Sunday worship ($n=101$). Community members were also very willing to share their vaccine status with First Church staff as part of a vaccine registry program, with 83% saying that they would 'definitely' be willing, and an additional 14% 'probably' willing.

How important is it to you that OTHER people mask outdoors?



How important is it to you that OTHER people mask indoors?



Airflow assessment

Air change reports were provided for Hillcrest and South Bay campuses on April 12, 2022. The American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE) recommends a minimum of 6.21 air exchanges per hour (ACH). In addition to ensuring a minimum ACH, ASHRAE also recommends using mechanical air cleaners (MERV-13 filters in HVAC, portable HEPA filters in higher risk areas) to remove virus particles from the air.

Hillcrest

The Hillcrest meeting house is 6,887 square feet and has an ACH of 4.2, significantly below the recommended level for safety. Other rooms are shown in the table below:

Room	Square Feet	ACH
Meeting House	6,887	4.2
Chapel	884	8.6
Main Hall	2100	9.7
Library	290	15.3
Room 117	270	15.3
Room 205	521	12.1
Room 208	230	14.8

Notably, the mechanics of the Hillcrest HVAC system result in spent air being vented through the ceiling, over the chancel, and through the choir loft. The system also relies on the fact that warmer (expelled) air rises, which means that it will be less effective in the winter when heating is needed.

South Bay

Only one of South Bay's four rooms exceeds minimum ASHRAE guidelines. One just meets guidelines, and two are below the recommended minimum for air exchanges per hour.

Room	Square Feet	ACH
101	803	6.3
103	1027	7.9
104	770	5.4
105	764	5.6

Recommendations

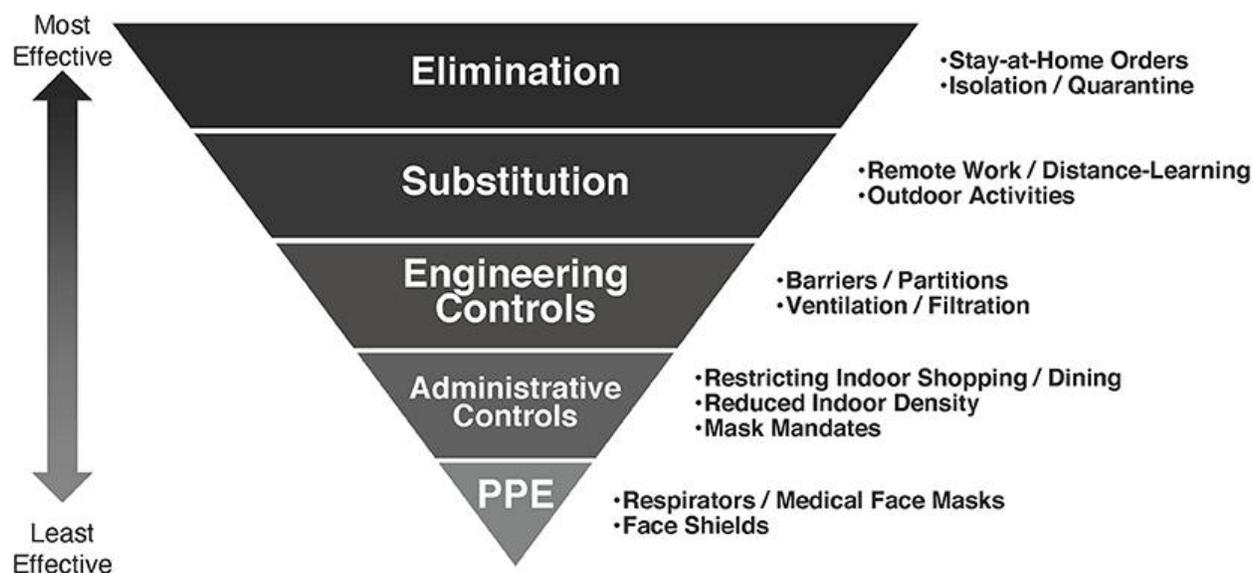
The First Unitarian Universalist Church of San Diego community highly prioritizes safety and welcome in our ongoing approach to COVID-19. In line with these stated community priorities, these recommendations center the concerns of those at highest risk, while also considering how to realize the priorities of the congregation, particularly a return to indoor worship, small groups, and singing. Recommendations will also consider how our practices can align with UU principles (2) Justice, equity, and compassion, (7) Respect for the interdependent web of existence, and

(8) Striving to accountably dismantle white supremacist systems of oppression within ourselves and our institution.

Utilize multiple and overlapping interventions

No single intervention can completely eliminate all risk of contracting COVID-19. Instead, risk mitigation strategies should consist of a toolkit of potential interventions that can be optimized to best suit the time, space, priorities, and attendee risk tolerance for a given event.

Intervention effectiveness should be considered across a spectrum, sometimes called the hierarchy of control. At one end of this spectrum, the risk of infection is removed by totally removing the virus from the environment through strict stay-at-home orders, isolation, and quarantine. On the other, and least effective, end of the spectrum is the individual use of personal protective equipment¹⁰.



The toolkit of intervention options can also be thought of according to the “Swiss Cheese” model popularized in a 2020 New York Times article¹¹. While any given intervention will have gaps, the more interventions that can be layered together, the lower the likelihood of infection transmission. When stacking interventions (or cheese slices) it is important to consider their relative efficaciousness at straining out risk.

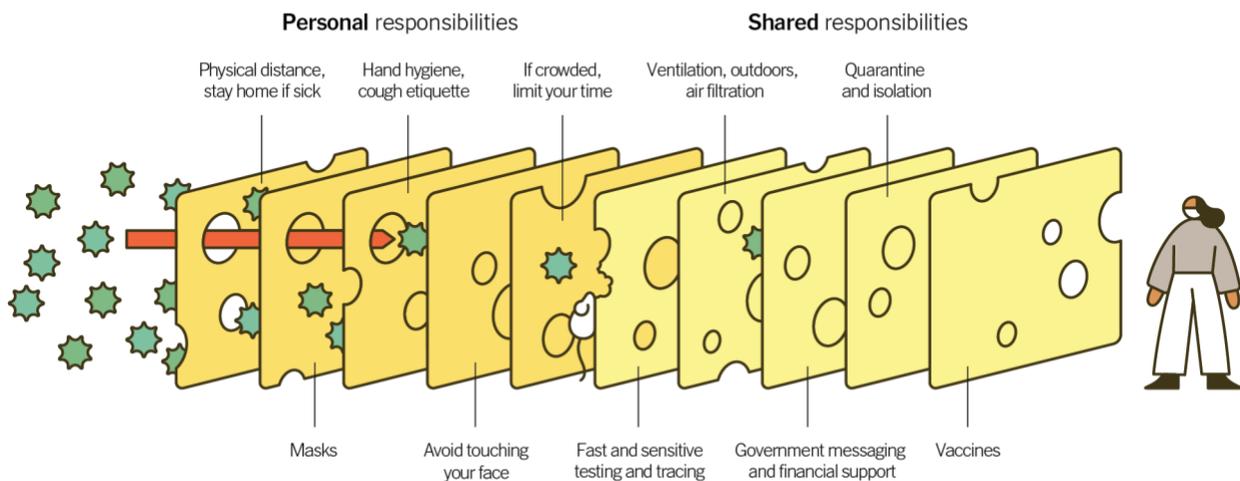
Below is a suite of potential options for COVID-19 protection in our community. Options are listed from most to least effective. The decision for which options to choose should be dictated by the event, participants, and current overall risk level in the region. The more options put in place, and the more options selected from higher in the list, the lower the risk level.

¹⁰ <https://www.frontiersin.org/articles/10.3389/fpubh.2021.747894/full>

¹¹ <https://www.nytimes.com/2020/12/05/health/coronavirus-swiss-cheese-infection-mackay.html>

Multiple Layers Improve Success

The Swiss Cheese Respiratory Pandemic Defense recognizes that no single intervention is perfect at preventing the spread of the coronavirus. Each intervention (layer) has holes.



Source: Adapted from Ian M. Mackay (virologydownunder.com) and James T. Reason. Illustration by Rose Wong

The worship team and small group leaders may want to consider publicizing which risk mitigation measures will be in place for a given event so that community members can decide for themselves if they feel that an event is appropriate for their own level of risk-tolerance.

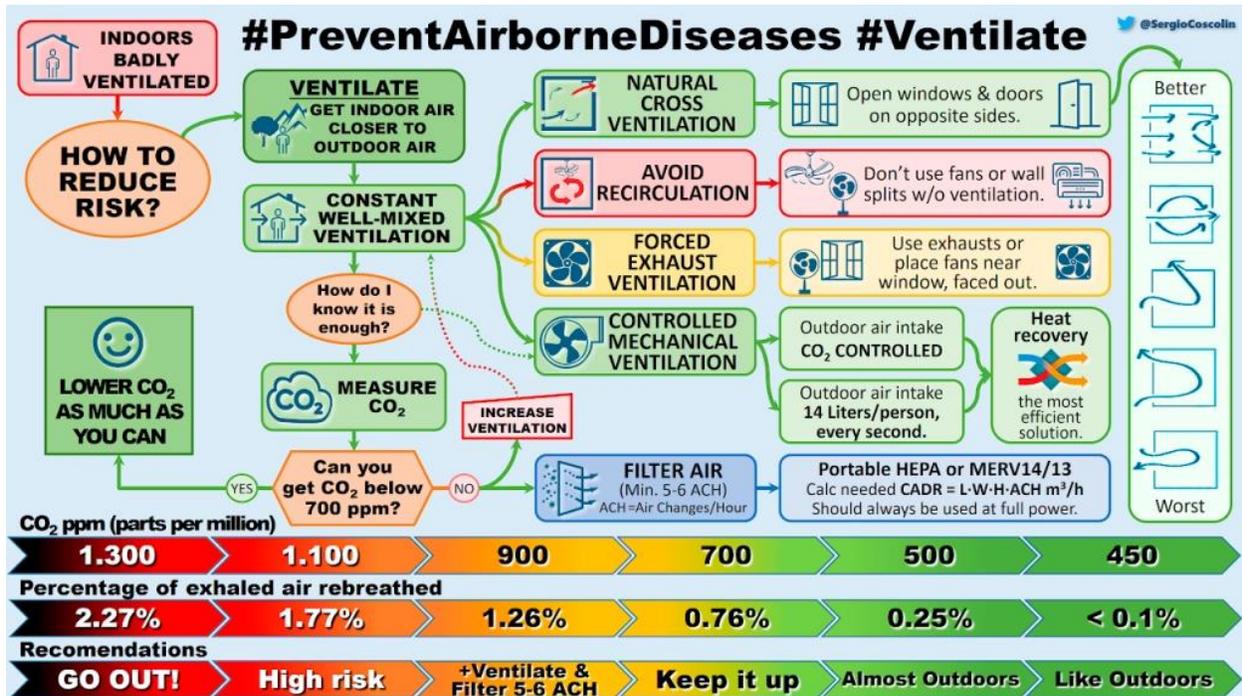
Substitution

- Maintaining a robust virtual option and providing support for small groups that would like to ensure equitable remote or hybrid options for some or all members.
- Prioritizing outdoor meetings to the extent possible and acceptable. Working to ensure that outdoor spaces are equally comfortable and accessible compared to indoor spaces (i.e., shade, amplification, seating).

Engineering

- Upgrading all HVAC systems to utilize MERV-13 filters
- Making CO₂ monitors available in small and large group meeting spaces. Levels of CO₂ should ideally be kept at 500 ppm or below.
- Providing HEPA filters, particularly in spaces with ACH below the recommended level (Hillcrest Meeting room, potentially all rooms in South Bay, particularly 104 and 105).
- Use CO₂ monitors to understand potential risk zones and prioritize placement of HEPA filters. For example, a HEPA filter should be present on the Chancel in the Hillcrest meeting room where a combination of unmasked speakers and the path of air venting could be dangerous for ministers and other service leaders.
- Place one or more HEPA filters in designated “lower-risk” areas, for individuals who would prefer an extra layer of safety. Using a HEPA filter with a carbon filter would have the added benefit of eliminating fragrances for those with sensitivities.

HEPA filters are currently the most widely available and affordable tools for air cleaning. As technology improves other options such as UV light cleaners may be worth considering, however, these do not currently have the same evidence base. A HEPA filter buying guide with a chart considering relative cost, noise, and effectiveness is available at <https://cleanaircrew.org/air-cleaners/>



Administrative controls

- Mandating universal masking, prioritizing high-quality good fitting masks such as N95 or KN95
- Providing support for finding masks that fit well. In addition to having masks available at all events, we may want to consider occasional “fitting events” in which community members can try an array of different mask types to see what works for them without committing to buying a set themselves. www.ProjectN95.com is a good resource for affordable and vetted masks.
- Utilizing the largest space available when meeting indoors to reduce density.
- Strongly recommending and/or mandating antigen testing for high-risk activities, groups, or times. If testing is required, leadership should make every effort to ensure that tests are accessible to all individuals who wish to participate.
- Creating and integrating COVID-19 safety expectations into small group covenants that are appropriate and acceptable for each unique group, and periodically reminding members what these are.
- Very high rates of vaccination in our congregation suggest that a vaccine registry is not necessary and should not be a high priority at this time.

Three clear facts emerged from the congregational survey regarding mask mandates as an administrative control: First, the community prioritizes safety and practicing an affirming welcome for all. Second, individuals at higher risk find continued masking in both indoor and outdoor settings to be important. And third, the vast majority of UU community members are willing to continue masking in all settings.

Risk assessment metrics

There are several possible metrics to use for risk assessment, all with their own benefits and detractions. Hospitalizations are not considered below as these are a lagging indicator and not a useful tool for making decisions about risk in real-time.

Case rates, particularly case rates of individuals who are vaccinated and boosted (i.e., the population that most closely resembles our community) are an important indicator. While all positive diagnostic tests are reported to County Public Health, official case rates very likely undercount the true rate of COVID-19 infection by a factor of at least 3-4. This is for several reasons: First, positive antigen (home) tests are not counted unless confirmed by a PCR, meaning that as home testing has become more accessible, diagnostic testing has become less reliable as a disease surveillance tool. Second, individuals who are vaccinated and boosted are more likely to have an asymptomatic infection and/or less likely to worry if a given mild symptom could be caused by COVID-19, and therefore may be less likely to access a test. Third, the federal government has recently ended support for diagnostic testing for individuals who are uninsured, leading to systematically less testing in low-income communities. Despite these caveats, case rates are still a useful way to assess trends. The percentage of diagnostic tests that are currently coming back positive (“positivity rate”) can suggest trends in community spread as well as ease of testing access.

Wastewater does not rely on individual access to tests and has been repeatedly shown to be a leading indicator of community infections. A drawback is that the science of COVID-19 wastewater epidemiology is still very new, albeit moving at an incredibly fast rate. There is currently no consensus regarding how to calculate the potential number of infections from wastewater viral load or how these data might be associated with the risk of community transmission. The CDC primarily considers trends in wastewater data, i.e., if viral load has climbed or decreased in the previous 7 days. The guidelines for wastewater cutoff in this document are based on analyses conducted by the Knight Lab at UCSD, which has led the wastewater surveillance response in San Diego County from the beginning of the pandemic. San Diego County wastewater data is available at <https://searchcovid.info/dashboards/wastewater-surveillance/>.

Given the above, the following metrics are suggested as a way of determining the current risk context for First UU activities. These metrics should be considered in their totality, with greater weight given to case rates and wastewater viral load.

The risk levels for case rates were determined by approximately calculating the probability that an infectious person would be present at an in-person gathering of 100 people (i.e., Sunday worship at Hillcrest), assuming a 14-day period of infectiousness and that case rates are undercounted by a factor of 3.

	Low	Medium	High
<i>Case rate for vaccinated + boosted (per 100,000)</i>	≤ 2	3-9	≥ 10
<i>Wastewater viral load</i>	<4 million	4 – 5 million	≥ 5 million
<i>Testing positivity rate</i>	$\leq 1\%$	2%-5%	$\geq 6\%$
R_0	<1.0	1.0-1.4	≥ 1.5

Consistency with UU principles

As a faith community rooted in shared values, it is important that our COVID response considers not just the evidence, but our principles as well. As an airborne, infectious disease, COVID-19 requires us to consistently recognize the ways in which we are interconnected with other members of our First UU community as well as all residents of the broader San Diego region. The second and seventh principles both call us to consider how our choices as a community may impact those who may be at higher risk.

Our community is extremely well vaccinated. As a predominantly White, affluent, and well-educated cohort, most individuals are also likely to have access to high-quality medical care (i.e., therapeutics). Within our own community a single incidence of transmission, or even a ‘super-spreading’ event, would most likely not result in high rates of severe disease or death. However, we are also members of the larger San Diego region that exists beyond Hillcrest and South Bay campuses.

COVID-19 transmission is largely stochastic, which means that when transmission does happen - particularly in settings that are indoors or otherwise high risk (many individuals unmasked, singing, chanting, etc...) - it is more likely to result in a large cluster of new infections than a single transmission from one person to another. This stochastic pattern means that group events have the potential to significantly magnify the number of individuals who could potentially seed new transmission chains in the broader community. Given our congregational demographics and the epidemiological patterns of the pandemic, this functionally means that a relatively privileged, White member of our community would have a high likelihood of transmitting an infection acquired at a church event to an essential worker or other higher-risk member of the broader community. The occupational risk of acquiring COVID-19 in these essential settings is one of the reasons why people of color and socially marginalized individuals who work in low-wage, essential jobs have experienced such devastating effects from the pandemic. The second and seventh principles call us to acknowledge this risk, and to consider

how the potential harms and benefits of our choices may be distributed across our large and interconnected region.

Our church has also adopted the 8th Principle, in which we have covenanted to “affirm a journey towards spiritual wholeness by working to build a diverse, multicultural Beloved community through actions that accountably dismantle racism and other oppressions in ourselves and our institutions.” The demographic data from the congregational COVID-19 survey is quite clear: First UU is currently not a diverse and multicultural community. As we choose our COVID-19 policies moving forward, it is important to consider the ramifications of our actions on the broader community (i.e., how may the *privilege* of choosing certain intervention approaches within our own community affect the risk of those outside?). It is also important to consider how our choices may affect our ability to build a diverse and multicultural community. What choices would we make if we were not considering who we currently are, but who we aspire to be? What choices would translate to an affirming welcome for individuals who have multiple risk factors such as hypertension or asthma due to environmental racism and historical underinvestment? To people who are disabled? To those who have less access to high-quality medical care?

Recommendations for the future of the reopening committee

As the reopening committee transitions to an ongoing COVID-19 response committee, the group is likely to have more tangible success if practices are codified with specific bylaws and deliverables. The committee is also more likely to be successful if it has a clear charge, and if that charge is developed to ensure consonance with UU principles. The committee should also include representation from Journey Towards Wholeness to ensure accountability to the 8th principle. Ideally, the group would also strive to ensure the representation of youth and/or individuals with disabilities.