

ONE HEALTH CHALLENGE

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What is our intervention?

BioDem combines a biodome containing specialized air filtration systems with programming that connects older adults with younger generations through a covid friendly space. The BioDem program coordinator will communicate with already existing adult day programs to decide the best use of the BioDem space (i.e., physical activities, arts and crafts, cooking, storytelling). We hope to gain cross-generational connections from volunteer youth facilitators who are hired to engage in activities that provide bidirectional growth and enjoyment.

What makes it special?

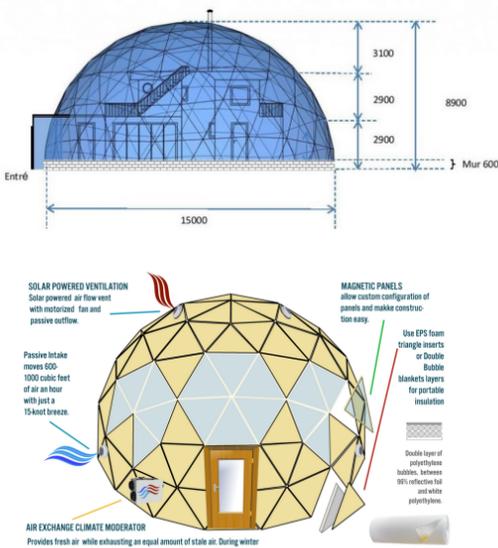
Architecture: 30x15m to accommodate social distancing. Accessible, plexi shields, and barriers for additional safety. Main room with two side rooms and flex space to promotes collaboration.

Plants and Greenery: Plants inside BioDem to purify air, green space maintained by members as an activity that helps contribute to mental wellbeing and environmental health.

Ventilation Technology: HVAC system draws air from outdoors and is runs it for 2h before and after BioDem occupancy. HVAC specs: MERC-13 filters; bio-polar ionizer filters; humidifiers; supplement HVAC system with HEPA filtration systems, fans inside the building, and sliding panels.

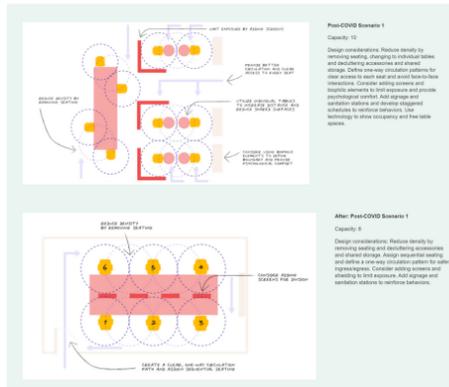
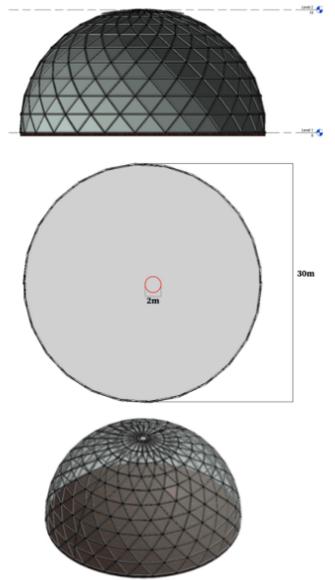
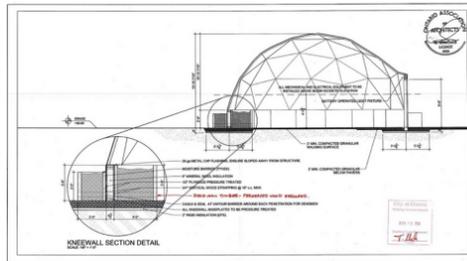
DESIGN AND INNOVATION

Biodome – Naturhus version 1b



HVAC REQUIREMENTS

- MERC-13 filters:** reduce droplet nuclei levels; have been effective at stopping spread of viruses.
- Bi-polar Ionizer Filters:** Seek out atoms/molecules in air to trade electrons with, neutralizing virus cells. Also low energy use and can be installed in wide range of HVAC systems.
- Fresh Air Purge System (Humidifier):** indoor humidity should be kept between 40%-60% at all times. Respiratory and immune functioning work better in higher humidity.



COSTS & FUNDING: building costs are \$130/sqft, air purifiers are \$600-2000 each, land is on average \$500,000. There are many opportunities for funding – The Health Effects Institute has funded global research on air quality and health effects of COVID-19, Research Net provides grant funding in pandemic research of up to \$500,000, and there has been successful fundraising initiatives for HEPA filters which we will use as motivation to crowdsource further funding as needed. We will shape this as a potential pilot research study and highlight potential benefit and opportunities this will provide.

Who is our target audience and how will it benefit them?

Youth and Adults:

Volunteer experience, planning and facilitating events, working with younger and older adults. Volunteers will develop skills that equip them with the ability to communication and collaborate effectively. Most importantly, this will allow youth and adults to foster cross-generational connection and decrease loneliness by engaging with other generations during this time of social isolation.

Community:

Pushes us towards safer and healthier architecture, which promotes mental wellbeing, which is beneficial as we navigate COVID-19. Designing and piloting efficient air purification system can help implement air purification in new buildings. Greenery in indoor and outdoor spaces can be extrapolated and implemented in community and urban development. This program may act as a pilot study to encourage social connectedness during time of isolations for vulnerable populations.

Older adults:

Older adults in long-term care facilities and retirement homes are disproportionately affected by COVID-19, from a physical and mental health perspective. This intervention will bring an easily accessible solution directly to them to help combat these issues and improve many aspects of wellbeing in older adults.

Programming and Evaluating Success

ACTIVITIES

BioDem youth and adult staff work with older adult programs to engage in activities that are enjoyable for all. The external program coordinator organizes pre-registration and transportation to ensure numbers are in accordance with COVID-19 guidelines. The goal is to provide a tailored and targeted experience to groups of individuals so they can participate in activities that best suit their interests.

PERSONNEL

- BioDem program coordinator** reaches out to communities affected by the pandemic to plan events in the BioDem.
- BioDem facilitators** are community volunteers who assist in programming and facilitating engaging events.
- BioDem maintenance staff** maintains air filtration system and ensures COVID-19 health protocols are in place.
- Outside program coordinators** communicate with BioDem program coordinator to arrange date and activities for BioDem "field trip."
- Outside program members** engage in symbiotic activities with the youth and offer ideas for tailored BioDem activities.

LEVERAGING EXISTING OPPORTUNITIES

We are not trying to recreate already existing day programs or facilities. Instead, we are partnering with existing community programs to create a novel and safe experience. We believe this is feasible as many programs have funding set aside for "day trips" and there are many funding opportunities for COVID-safe infrastructure. The BioDem will foster community connections.