Public Health Ontario | Santé publique Ontario

RAPID REVIEW

# **(ARCHIVED)** COVID-19 Transmission and Dining Domes

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## Key Findings

- Dining domes are temporary structures, usually comprising a rigid frame with a transparent cover, creating an enclosure (often bubble-like) in an outdoor setting. The structures vary by size and material.
- The variation in the setup and characteristics of specific dining domes and how closely they resemble the indoor versus outdoor environment may affect the transmission risk for COVID-19 in these settings.
- The greatest risk for COVID-19 transmission is likely from close unprotected contact of the diners sharing the meal, (similar to indoor dining). Wait staff without appropriate PPE may also be at risk due to multiple exposures to unmasked diners in a confined space.
- As a result of the typically small, enclosed spaces, there may be added potential for fomite transmission if there is inadequate cleaning and disinfection of the dome.
- In the winter months, fuel-based heaters in domes can also pose a health risk due to the potential for carbon monoxide exposure and fire. Heater devices in general may pose an injury risk in confined spaces.
- There is little evidence to guide the use of dining domes but practical considerations may include and are not limited to masks and face coverings when possible, physical separation of tables if multiple tables are placed in one dome and adherence to public health guidelines for COVID-19 preventions to mitigate transmission risk.

## Objectives and Scope

- This rapid review addresses the following question:

- Is there any evidence on potential COVID-19 transmission from dining domes in restaurant settings and advice related to their use?

# Background

- While the concept predates the COVID-19 pandemic, tents or domes for dining, often transparent, have garnered increasing attention[1] as a possible means to extend dining service outdoors, particularly during winter months. They are temporary structures, usually comprising a rigid frame with a transparent cover, creating an enclosure (often bubble-like) in an outdoor setting. The structures vary by size and material.

# Methods

A search of Google Scholar was performed on Oct 20 2020 using multiple search strings. A complete search methodology is available upon request. The first 100 search results of each string were reviewed.

On October 20, 2020 a literature search of MEDLINE platform for articles published from 1946 to October 19, 2020 was conducted. The search was limited to literature published in English. Some of the terms in the searches included: COVID-19*, coronavirus disease, coronavirus outbreak, restaurants, bar, café, catering, dome, bubble, geodome, geodesic, igloo, pod, tent, patio*, terrace, partition, enclosure, plastic and plexiglass. A complete search methodology is available upon request. Titles and abstracts were screened for relevance.

A broad jurisdiction scan was not done however we contacted public health authorities in Alberta, British Columbia and Quebec, inquiring about their approach to dining domes.

# Results

- The predominant mode of transmission of COVID-19 is via respiratory droplets during close unprotected contact. Currently airborne spread has not been a dominant or common mode of transmission.[2] However, transmission in poorly ventilated indoor settings have been reported.[3–5] There is limited empirical evidence for fomite transmission, however it is assumed to be possible as the virus can survive on different surfaces for various lengths of time.[2]

- An article which looked at mitigating measures in different settings including restaurants suggested wearing a mask (when possible), advanced ventilation systems such as displacement ventilation[a] and partition screens between tables in restaurants to mitigate the risk of COVID-19 spreading.[6]

- A preprint from Japan reported secondary transmission data with the aim of identifying high risk transmission settings. As of February 26, 2020, a total of 110 cases among eleven clusters were

[a] Displacement ventilation systems remove contaminated indoor air and supply fresh outside air in a predominantly even, buoyancy assisted fashion, effectively displacing it with no or little disruption. They are primarily passive systems such as Natural Ventilation cowls, façade louvres or automatically opening windows. This ventilation method generally produces a laminar airflow within rooms (outside of very windy conditions).[10]

investigated. All clusters were associated with close contact in indoor environments, which included a snow festival where there were eating spaces in tents with minimal ventilation rate.[7]

- In August 2020, San Francisco city inspectors ordered a restaurant owner to remove plastic geodesic domes placed outside of the restaurant. The inspector was concerned about the air circulation within the domes.[8]

- In Quebec, a dining dome would be considered an "indoor" space and public health guidelines specific to indoor spaces would be applied to dining domes. In Alberta, dining domes are permitted. The domes have to be well ventilated, and there is a maximum of 6 people per dome. In addition they have to meet Alberta's COVID-19 indoor dining guidelines.[9] British Columbia largely has experience with dining domes from prior to the pandemic (email communication, references available on request).

# Discussion

Dining domes provide a contained enclosure in outdoor spaces where people may gather. Data are limited with respect transmission risk of COVID-19 in such structures, and only one report suggested transmission in eating spaces in tents. While there is little evidence to guide their use, practical considerations may include:

- The potential variation in the setup of dining domes, e.g. the occupancy, how well it is ventilated/open to the outdoor environment, affects how closely they resemble the indoor versus outdoor environment and the transmission risk in these settings.

- Given the small size and closed environment, ensuring some form of ventilation of occupants' expired air is important, during use and between users.

- The greatest risk for COVID-19 is likely from close unprotected contact of the diners sharing the meal, particularly if dining with non-household companions (as during indoor dining). Wait staff without appropriate PPE may also be at risk due to multiple exposures to unmasked diners in a confined space.

- Also owing to the small, enclosed space, there may be added potential for fomite transmission if there is inadequate cleaning and disinfection of the dome.

- In the winter months, fuel-based heaters in domes pose a health risk due to the potential for carbon monoxide exposure and fire. Heater devices in general may pose an injury risk in confined spaces.

- Masks and face coverings when possible, physical separation of tables if multiple tables are placed in one dome and adherence to public health guidelines for COVID-19 preventions should mitigate transmission risk.

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