COVID + CARE HOMES

STRATEGIES FOR PROMOTING HIGH-QUALITY, PANDEMIC-CONSCIOUS DESIGN

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The problem we set out to solve was that Scottish care homes are disproportionately affected by the coronavirus pandemic. One half of COVID-19 deaths in the UK were tied to care homes, and in Scotland 60% of their care homes had at least one case of COVID-19 as of May 2020. Since Scottish care homes were affected by the pandemic more than any other Scottish business or residence type, we believe the design of care homes needs to be researched and then altered to better adapt to a pandemic scenario.
The UK saw some of the highest percentages of COVID-19 deaths attributed to care homes. It was clear we needed to re-examine how elder is delivered in the UK in general, and Scotland specifically, to find opportunities for improving the system.
THE CONNECTION BETWEEN DEMENTIA + ALZHEIMER’S AND COVID-19

Memory care home residents struggle with remembering to wear PPE, wash their hands regularly, avoid close contact with others, and other safety measures. Another main issue with memory care residents during the pandemic was isolation. Isolation is detrimental to the already strained memory of these care home residents and results in poor mental and physical health. This group presents a variety of unique design challenges to keep residents safe while also engaging them mentally.

### Proportion of Deaths of Scottish Care Home Residents Involving Preexisting Conditions

(02 March - 12 June 2020)

<table>
<thead>
<tr>
<th>Condition</th>
<th>Men</th>
<th>Women</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dementia + Alzheimer Disease</td>
<td>50%</td>
<td>60%</td>
</tr>
<tr>
<td>Ill-Defined Conditions</td>
<td>20%</td>
<td>30%</td>
</tr>
<tr>
<td>No Preexisting Conditions</td>
<td>10%</td>
<td>20%</td>
</tr>
<tr>
<td>Ischaemic Heart Disease</td>
<td>5%</td>
<td>10%</td>
</tr>
<tr>
<td>Chronic Lower Respiratory Disease</td>
<td>2%</td>
<td>4%</td>
</tr>
<tr>
<td>Influenza + Pneumonia</td>
<td>1%</td>
<td>2%</td>
</tr>
</tbody>
</table>

**About Graph 02:** Dementia and Alzheimer’s Disease were the most common preexisting conditions amongst COVID-19 deaths in English and Welsh care homes. One or both of these conditions were involved in 49.5% of all care home resident deaths related to COVID-19.
At least 70% of care homes with 30 or more beds had at least one COVID-19 case as of summer 2020. This finding showed us that smaller care homes or care homes with a household scheme performed better during the pandemic.

**CUMULATIVE PERCENTAGE (%) OF SCOTTISH CARE HOMES WITH A SUSPECTED COVID-19 CASE BY SIZE**

- 1-10 beds: 22%
- 11-20 beds: 47%
- 21-30 beds: 63%
- 31-40 beds: 71%
- 41-50 beds: 84%
- 51-60 beds: 87%
- 60+ beds: 91%

70% or more of care homes with more than 30 beds had at least one case of coronavirus.

**ABOUT GRAPH 03:** A more detailed breakdown of the COVID numbers shows that COVID-19 occurrences were even more common among larger care homes, especially in those with more than 30 beds.
Although COVID-19 spread through care homes like wild fire, it appears over-capacity was not a major issue in the spread of COVID-19. In the U.S. it was found that some of the care homes with the most COVID-19 cases as of summer 2020. It seems that residents have plenty of space, they simply need better utilization of spaces.
Five care homes lauded for their design features became case studies for high quality yet safe care home design strategies. In addition, narrative accounts captured from online blogs, news articles, and care home websites helped paint a picture of life in care home facilities during the COVID-19 pandemic. Both sets of case studies helped identify design considerations to accommodate in future care home designs.
PANDEMIC-DESIGN RESEARCH BY OTHER FIRMS

We explored several examples of architecture firms producing publications about pandemic-conscious design. In the case of care home design, MASS Design Group became a great precedent for understanding both the factors of pandemic design to focus on, as well as how to present the research in actionable features that could be included for future care home design.

IMAGE CREDIT: MASS Design Group, 2020
*reformatted for the presentation
LESSONS FROM CARE HOMES HIT HARD BY COVID

In order to understand the specific performance of care-home design in the coronavirus pandemic, five Washington State care homes were identified as having more than 50 cases of coronavirus linked to the care home facility. We sourced news articles, blogs, and care home websites to gather narratives about the experiences in these heavily affected care homes, which formed the first “epicenter” of the virus in the United States. Of these experiences, we learned that there are five main categories where architecture could help for future pandemics:

- RETHINKING PROGRAM/ADDITIONAL USES
- SIGNAGE + MATERIALS + CIRCULATION
- OUTDOOR SPACES
- PANDEMIC-ACTIVATED COMMON SPACES
- INTEGRATING POLICY WITH DESIGN

COVID CASES PER WASHINGTON STATE COUNTY:
Care Homes in Seattle, WA became the American epicenter in March 2020. We identified five care homes.
“Sometimes, she would cry because the nurses redirecting her looked alien and strange in their surgical masks.”

How can architecture help familiarize residents when staff uniforms and protocols disrupt a sense of place and home, especially as routines like mealtime change to room delivery?

“The nurses wheeling sick residents out the front — sometimes holding white bedsheets around the stretchers to shield the patients from the photographers waiting at the side of the road.” Designers should accommodate the interior circulation of both healthy residents and visitors, as well as the unfortunate (but necessary) transportation of sick residents outside of the facility.

“The nurses had seen nursing aides go room to room without washing their hands.”

“They had seen nursing aides go room to room without washing their hands.”

“The patios have been open... socially distanced by at least 25 feet from other residents. Fresh air and sunshine are wonderful mood boosters.”

“For some people, the [common room] parties could be a bit hammy. The costumes, the playlists, the syrupy, exaggerated way that everyone seemed to speak to the residents.”

“Sometimes, there wasn’t even time to clean up after a resident was sent to the hospital... it weirded her out to see old hairbrushes and oxygen tubing lying on abandoned beds.”

“She can barely make out the shape of her dad in a white T-shirt through the reflection of herself in a mask. He doesn’t have the strength to sit up close to the window to talk.”

VISUALIZING USER EXPERIENCE

Below is an annotated axon in the spirit of our precedent, MASS Design Group. We documented user experiences during covid, by gathering quotes and experiences from various articles involving the most affected care homes in the United States.
 DESIGN CONSIDERATIONS INFORMED BY PANDEMIC EXPERIENCES

From the experiences gathered, we then offered reflections on how architecture could ameliorate future pandemic scenarios. These design considerations often reinforced the suggestions by our firm precedents, but also presented new nuances based on the specific narrative accounts we curated. Below are a sample of reflections.

**Hand-Washing Station in Hallway.**
Nurses had difficulty washing their hands between cleaning rooms.

**Doorways As Gathering Spaces.**
Consider the depth of the doorway. During hallway-bingo, residents sit in the doorway. Or when pandemic restrictions lessened, neighbors were allowed to stand in the doorway to talk to residents inside their room.

**Hallways as Static Spaces.**
During the height of the pandemic, hallways were not mere circulation spaces, but rather provided the large expanse needed for residents to gather while staying distant. Creating more pockets of interaction in the hallway can help 1) provide residents with low mobility a stopping point to rest, 2) provide intimate common spaces for residents, and 3) be utilized during pandemic procedures.

**Window Visits.**
Window visits with residents revealed the existing challenges of several care homes. Residents had trouble accessing window visits due to furniture, sill depth, and lack of programmed sitting space for window visits that required residents to stand. Prioritizing engagement with the window can help instill a connection to the outdoor landscape, which has been shown to help with dementia patients.

**Common Spaces.**
Most common spaces were closed during the pandemic. Important things to note: 1) there is a need to rethink how common spaces can be activated safely during the next pandemic (even if for an alternative use), and 2) the furniture in common rooms were described as accommodating large groups best, sometimes at the expense of more intimate gatherings.

**Auxiliary, Flexible Space**
Architecture needs to program space to accommodate the potentially infected belongings of residents, to clean out oxygen tubes, and to store belongings when residents are hospitalized. This compliments the existing proposal of MASS Design Group, who called for adaptable spaces to accommodate grocers and medical suppliers during pandemics.

**Signage + Way-finding.**
Ad-hoc signs posted on walls were sometimes the first way that residents learned about pandemic procedures. Integrating signage + information into the user experience can help familiarize residents and make the environment feel less alien were the signs have to be used to call out pandemic procedures. In addition, MASS Design Group noted the importance of coloring high-traffic surfaces, so that extra attention to cleaning can be taken.
Given the need to rethink care home models for a postpandemic future, we researched existing care homes that were praised for the integration of six design principles: affordability, sustainability, innovation, resident-centered design, health and safety, and integration into the larger community and landscape.
In order to understand the current design of care homes, we researched care home models that are praised for both well-executed architectural design as well as performative ability. From a list of twenty-nine high-quality care homes, five were selected for an in-depth study. The following care homes were assessed based on their affordability, environmental sustainability, integration of technology, resident-centered priorities, landscaping, and prioritization of resident health and safety:

**De Hogeweyk**, Weesp, Netherlands
(Molenaar & Bol & Valdilen Architekten)

**The Caleb Hitchcock Memory Care Neighborhood**, Bloomfield, Connecticut, USA
(Amenta Emma Architects)

**Jin Wellbeing County**, Khlong Luang, Thailand
(Shma Company Limited + Openbox Architects)

**Belong Atherton**, Lancashire, United Kingdom
(Pozzoni, LLP)

**Neptuna Development**, Malmö, Sweden
(Arkitektgruppen Malmö AB) *with greenhouse by Monika Gora*
EXISTING CARE HOME MODELS PRINCIPLES

1. Arrangement of rooms into households (pod design)

2. Amount and programming of green space

3. Program, circulation, wayfinding, and adjacencies

4. Integration into larger community (mixed-use design)

5. Integration with education

6. Health, telehealth, + other tech integration

7. Affordability + construction
1. ARRANGEMENT OF ROOMS INTO HOUSEHOLDS (POD DESIGN)
### 2. AMOUNT OF PROGRAMMED GREEN SPACE

<table>
<thead>
<tr>
<th>CARE HOMES WITH HIGH COVID-19 CASE TO CERTIFIED BED RATIOS</th>
<th>CARE HOMES HIGHLY REGARDED FOR THEIR GOOD DESIGN, INCLUDING INTEGRATION OF OUTDOOR SPACE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Redwood Springs Nursing Home Visalia, CA</td>
<td>Caleb Hitchcock Memory Care Neighborhood Bloomfield, CT, USA</td>
</tr>
<tr>
<td>98.86 COVID-19 cases per certified bed</td>
<td>Amenta Emma Architects</td>
</tr>
<tr>
<td>1174 cases total</td>
<td></td>
</tr>
<tr>
<td>Pruit Health Palmyra Nursing Home Albany, GA</td>
<td>Belong Atherton Lancashire, UK</td>
</tr>
<tr>
<td>99.40 COVID-19 cases per certified bed</td>
<td>Pozzoni, LLP</td>
</tr>
<tr>
<td>168 resident cases total, 81 staff</td>
<td></td>
</tr>
<tr>
<td>Hammonton Center for Rehab &amp; Nursing Hammonton, NJ</td>
<td>Kendal at Ithaca Ithaca, NY, USA</td>
</tr>
<tr>
<td>106.33 COVID-19 cases per certified bed</td>
<td>Perkins Eastman</td>
</tr>
<tr>
<td>169 resident cases total, 61 staff</td>
<td></td>
</tr>
<tr>
<td>FutureCare Lochearn Nursing Home Baltimore, MD</td>
<td>Neptuna Development Malmö, Sweden</td>
</tr>
<tr>
<td>115.50 COVID-19 cases per certified bed</td>
<td>Arkitektgruppen Malmö AB greenhouse by Monika Gora</td>
</tr>
<tr>
<td>231 cases total</td>
<td></td>
</tr>
<tr>
<td>Gallatin Center for Rehab &amp; Healing Gallatin, TN</td>
<td>Sun City Tachikawa Showa Kinen Koen Tachikawa, Japan</td>
</tr>
<tr>
<td>135.00 COVID-19 cases per certified bed</td>
<td>SWA</td>
</tr>
<tr>
<td>162 cases total</td>
<td></td>
</tr>
</tbody>
</table>
3. PROGRAM, CIRCULATION, WAYFINDING, + ADJACENCIES
4. INTEGRATION INTO THE LARGER COMMUNITY (MIXED-USE DESIGN)
5. INTEGRATION WITH EDUCATION

Residents benefit from classes + activities, students benefit from teaching + training opportunity
6. HEALTH, TELEHEALTH, + OTHER TECH INTEGRATION

Extensive healthcare facilities integrated on-site

“Never 2 Late” computer-based program used to interact with friends and family
7. AFFORDABILITY + CONSTRUCTION

The Belong company was created out of two non-profits, and when designing Atherton they focused on affordability. For this reason, the 12-residents households are more of an “extended family” concept. Affordable and flexible use of space was a key driver of the overall design. The inclusion of the assisted living facility provides residents with more options for care; there are many purchase and rental options depending on the residents’ needs. The integration of the public into the facility also helps offset costs, as the public can use many of the common facilities including the bistro, hair salon, shop, and internet cafe.
APPLYING RESEARCH / DESIGN CHARRETTEs
We also looked at the “Green House” model for care homes, which focuses on providing a bedroom with private bath facilities, while the communal space offers a variety of lounge and office spaces, as well as a large communal kitchen and dining room to encourage socialization. The “Green House” model attempts to integrate outdoor space by placing such on each side of the communal zone. We imagine these principles could become modularized to create a larger network of living pods within a single care home facility.
HOW THE BIOQUARTER LENDS ITSELF WELL TO A CARE HOME

Using the information gathered about care-home designs, we started to work with John McAslan + Partners on putting the research to practice by understanding the opportunities that the bioQuarter site offers for a care home.

We elaborated on the scheme started by John McAslan + Partners to explore other ways that the care home could begin to situate on the corridor - looking to highlight the advantages the care home has in its proximity to the Royal Infirmary, amongst other buildings and university/research activities.
DEVELOP SEPARATE, BUT RELATED TYPOLOGY

We explored iterations of the pod-style care home, combining elements from the Green House model. The resulting sketches included two preliminary design schemes, one of which is shown below. This sample design is two stories and prioritizes the common spaces as the central nodes in each of the three wings.

SITE PLAN IN BIOQUARTER

CLOSE-UP OF ONE 12BED POD

PRIVATE STUDIO
STAFF/LAUNDRY
KITCHEN
POD DINING + LOUNGE
CINEMA/CAFE/ETC.
LEARNING CENTER
DEVELOP SEPARATE, BUT RELATED TYPOLOGY (PART TWO)

Alternate layout that centralizes facility-wide amenities, then pod-community amenities.
Another strategy we explored involved adapting the existing mixed-use typology of the bioQuarter. We looked at ways that the care home may become a stacked care home, sharing a terrace that offers direct access to apartments or a view down into the terrace. The ground floor would be supported by various potential programming, with the intention of incorporating the broader bioQuarter community into the building through the use of programs on this ground floor.

IMAGE: promotional render for the bioQuarter
THANK YOU


SOURCES (+ CITED WORKS IN THE WRITTEN PAPER)


Webinar: Design of Healthcare Facilities Across Countries, AIA | DC, 28 July 2020