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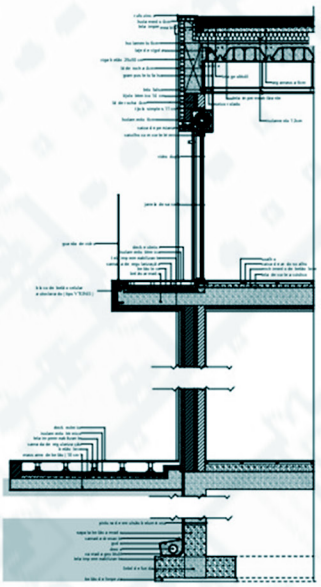

CORTE CONSTRUTIVO 1:100

ARCHITECTURE AND PANDEMICS

DESIGN STUDIO ASSIGNMENT AND INTERDISCIPLINARY CONTRIBUTIONS TO A HEALTH PARK FOR COVID-19

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INTRODUCTION

Towards an humanitarian architecture for the disaster-risk of respiratory diseases

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In the second week of March 2020 Portugal entered a state of emergency due to the COVID-19 pandemic and the national government established a first period of quarantine for the entire country. To overcome the lockdown and keep the academic schedule, universities switched to online classes, although there were little or no previous experiences at all of non-presential classes. In face of unexpected, radical and somehow harmful changes in our cheerful day-to-day lives, we proposed our students (of the first year of the integrated master's degree in architecture) at the University of Beira Interior (UBI) to engage in the serious societal challenge we were facing. This meant, in case that could make sense, responding to the new coronavirus outbreak through architecture and urban design.

Already immersed in zoom classes, and working from home as one sole design office team, we start to think of a health unit for the treatment of the new (and frighteningly lethal at the time) virus. This choice of an absolutely timely and ground-breaking design assignment, instead of the conventional ones (the typical architectural exercises

focusing on either public parks, housing or collective equipment, schools, health centers, cultural centers, etc), was taken with enthusiasm by the abruptly confined students. Lockdown had implicit that we, human beings, as hosts of the virus and potential disease transmission agents, were part of the problem. Addressing a design challenge that could relieve infected people, in particular the elder and their relatives, together with shaping proper spaces for the job to be done by healthcare professionals had the positive effect of putting aside that heavy burden placed by the pandemic; and, ia a waw, brought back students to the game. Students were asked to contextualize this project on an unbuilt plot of land close to the Centro Hospitalar da Cova da Beira, in Covilhã (next to the city's main shopping mall and adjacent to a residential area) and to develop it completely, from the urban to the detailed scale. Given the restrictions imposed on freedom of circulation by authorities due the pandemic, which of course limited the possibility of a timid reaction of students was expected, However, their response to the challenge was striking. So, we confidently and progressively increased the brief objectives and tried to aggregate knowledge and expertise towards an encompassing approach to architecture that could mitigate the pandemic impacts, enhance resilience of those directly affected, and reduce the disaster-risk associated with the seemingly unstoppable spreading virus.

The exercise lasted the entire second semester and ended with an online exhibition of the students' delivery panels, followed by a seminar in the form of a webinar. The latter, under the title "Humanitarian Architecture and COVID-19", had the participation of academics from various disciplinary areas related to the functional program and proposed architectural challenge: to cross hospital architecture ideas for infectious respiratory diseases, health and well-being in a broader sense. The webinar was open to the whole community of the University of Beira Interior (UBI) and beyond, and the session was recorded on the DECA youtube channel of the Department of Civil Engineering and Architecture at UBI.

The following pages bring together a synthesis of selected students' work, prioritizing the functional and formal solutions they created to address safe circuits for professionals and patient visitors, natural sunlight and ventilation, highlighting a humanitarian approach to architecture. By accepting the role of making a shared but also an individual contribution to the emerging humanitarian dramas related to Covid-19 students become game

changers.

This manuscript further reunites a summary of the speeches and debate's comments of the guest speakers during the webinar, which were transformed by themselves into small chapters of this scientific but also, pedagogical publication. Thus, it is expected that the various fields of study contributions can be useful to explore the relationship between architecture and medicine in education (Colominas 2019, Pinto 2015). Moreover, that the subsidies to the architectural project serve to strengthen this relationship, through an update of disciplinary knowledge that the history of architecture and respiratory diseases as well as this first multidisciplinary approach to the pandemic we are experiencing, demonstrate to be convergent. Indeed, they intercepted in a fertile way throughout the 20th century, in particular in the extraordinarily rich experience of the sanatoriums for tuberculosis . (Colominas 2019, Pinto 2015, Vieira 2012).

As a scholar and practitioner focused on the humanitarian dimension of architecture for the past seven years, I should emphasize the relationship, that this simple book seeks to contribute to clarify, between architecture and the pandemic caused by the SARS-CoV 2 virus. A pandemic that, for its unanticipated and significant impacts, must be seen as a disaster in the scientific sense of the term (Martins, 2020 and 2021); in this case a biological disaster. Based on data provided by the World Health Organization we recall the numbers of victims as of October 20, 2021: more than one million infected and 18 thousand dead in Portugal alone, more than 248 million infected and 5 million of fatalities worldwide, including 17,000 health professionals (more than 28,000 professionals infected in Portugal, with several dozen fatalities).

The losses caused by the pandemic can be measured using several indicators. One of the most talked about in the media, in addition to irreplaceable human lives, is, of course, economic. The successive lockdowns, the forced stoppage of companies and services resulted in economic deficits never before experienced, many millions of unemployed around the world in a short space of time. To avoid the financial collapse, governments and international organizations took drastic measures, injecting funds into key sectors of the economy and subsidizing the most severely affected families and economic agents.

The impacts of the pandemic, however, have hidden dimensions that architecture not only does not hide, but rather expose. They relate to the dramas associated with restrictions on contacts between hospitalized patients and their families. The ban on visits to hospitals and elderly people's homes meant that many people hospitalized with severe symptoms ended up dying without having had the opportunity to bid farewell to their loved ones. Not even the later use of video calls, through mobile digital equipment, to mitigate the impact of distancing, managed to minimize the tragedy lived by the families in which the fatal disease struck (SNS 2020, 'O Público' newspaper 20 March 2020) . In a few senior healthcare units, staff, proactive doctors and public health officials managed to introduce architectural modifications to allow families to see, through improvised transparent walls, their parents and grandparents.

On the other hand, hard-pressed health professionals were forced to work in health units generally that proved incapable of preventing contagion on a small scale. Although personal protection accessories were available (gloves, visors, goggles and uniforms), doctors, nurses and assistants were constrained to work in cramped, often poorly ventilated, without natural lighting and with no separation of circuits infected - not infected. Without options to face the sanitary emergency, health professionals continued their work in incongruent conditions considered the virus highly contagious power, mainly through physical contact with objects but basically , as it was early comprehended , by air-respiratory route (Gameiro 2020). In very few cases, in which the hospitals were the result of the adaptation of old health unities designed for the tuberculosis, nurses and doctors struggling to avoid contaminating each others and no covid-infected patients, attempt to reopen original and long time abandoned internal circuits, as it happened in the covid frontline of combat in the Hospital of Guarda, nearby the city Covilhã.

The requirements of the project exercise were discussed together with the students, in a moment of tension, with doubts about the impact of the pandemic that was coming, and uncertainties about the type of teaching & learning to be adopted by the university. So, immediately joining digital communication platforms, like Zoom, we all went home to research how we could make a contribution to solving the problem. Yes, to make a

contribution, as it was evident to our eyes that if it had to do with air transmission (of a virus) it had to do with spaces, with their architecture, their ventilation and natural light.

While learning to deal with online classes, we started by studying the specific building codes for hospital spaces designed from scratch or adapted to infectious diseases (Colominas 2019, Pinto 2017). It soon became apparent in these first forays into the legal framework that the speed of transmission and virulence of the new coronavirus escaped the reasoning and concerns of legislators. In other words, the regulations did not seem appropriate to avoid contagion, neither between professionals and patients, nor between them. And it clearly did not have a plan B to circumvent the risk of contagion as to allow contact, in a safe way, between patients and family members, and between health professionals and their own family members. Symptomatically, some professionals on the front line of combating the virus, which included emergency medical personnel from ambulances, ended up being away for weeks or even months from their families, staying overnight in hotels, caravans and trailers, sometimes benefiting from the support of public and private entities. (NiT, January 28, 2021)

Respiratory diseases occupy a prominent place in the history of public health in Portugal (Doria 2017). Despite this, the regulatory gaps were all too evident. Therefore, we chose not to limit ourselves to the simple application of legislation to define the functional program of the project and turned our attention to the demanding answers that architecture was called to give to other pandemics in the past (Colominas 2017, Nunes 2019). Two of them emerged with great exuberance: the Spanish flu that in the 10s and 20s killed some tens of millions of people around the world, and, even more acutely, that of tuberculosis, which spread overwhelmingly throughout the developed world from the second half of the 19th century to the 1960s (Doria 2017, Tavares 2004). This is how we inescapably ended up studying the old sanatoriums, almost abandoned or re-functionalized, designed in Portugal and Europe by great names in architecture (Nunes 2018, Tavarez 2004), with the exponent of Alvar Aalto in Paimio (Bianchini 2020) , Colominas 2019 , Mindel 2020). Between the end of the 19th century and the first decades of the 20th century, the first mountain sanatoriums were opened in Portugal, in Covilhã, the Ferroviários one, by Cotinelli Telmo and then the one in Guarda, by Raul

Lino (Vieira 2018).

In the post-World War II period, when tuberculosis killed tens of thousands of people a year, Portugal, perhaps benefiting from its status of political neutrality in times of the Cold War, became the epicenter of European sanatoriums (Doria 2017, Pinto 2017). In this context, the village of Caramulo emerges, designed from scratch to accommodate hospital infrastructure and which at one time housed 19 sanatoriums, inaugurating a unique urban experience (Vieira, 2012). In fact, in the absence of medicines and vaccines, sanatoriums were the answer that society, both in Portugal and in other European countries, managed to give to tuberculosis (Mindel 2020, Nunes 2017, Sirel 2021). Not surprising, the works of UBI's master students have recovered this forgotten knowledge (Sirel 2021). And, with imagination and creative flair, amplified the architectural particular responses, introducing more types of balconies/solariums, natural ventilation systems, and safe internal circuits for different groups, professionals not-professionals, allowing limited visits and short time presence of relatives in the hospital facilities, including connections to mortuary spaces, to ensure dignified funeral ceremonies. Further, surrounding spaces included walking green and sunny areas suitable for recovery phases and housing small units to host health professionals and family members of those locked for a long time for health or job demanding requirements.

In addition to the historical sources, which offered the concept of a building-sanatorium type (Colominas 2019, Doria 2017, Pinto 2017) used as a case study by the students, they used other sources, again works of architecture, to fill their design studio assignment. This time the major reference was the work developed by the MASS group, led by the architect Michael Murphy, from the headquarters in Boston, Massachusetts, and which has dedicated attention to hospital equipment dedicated to Ebola or tuberculosis, such as the Gheskio hospital project, in Port -au-Prince, in Haiti. (Charlesworth 2014).

Among our guest authors are academics from different disciplines and professional experience. As expected, they express different perspectives; from an architect who

studied sanatoriums, such as the architect and researcher José Carlos Avelãs, to the psychologists Rosa Afonso and Margarida Lima, passing through the infectious disease specialist who lived through the pandemic in a hospital environment António Maio, to Isabel Calado, with her focus on visual culture, and finally to UBI professors Eduardo Cavaco and Miguel Santiago Fernandes, the former biologist dedicated to innovation in health sciences and the latter an architect with vast professional and pedagogical experience. To all, students and faculty colleagues, my sincere thanks for accepting the pioneering challenge of relating architecture and covid-19, thus embarking on this exploratory interdisciplinary journey.

This academic experience and its main results necessarily reflect a still-hot view, with SARS-Cov 2 cases and deaths still on the rise in many countries. Still, it may be useful to keep the debate going. After having reached a promising control of the virus impacts, thanks to the massive vaccinations programs, it is about time to understand to what extent we, as a society, can do better regarding hospitals and healthcare unities' infrastructures ; and, accordingly, investigate, in between the intersection of complementary field of study and the very history and grounds of the architectural discipline, how the pandemic could permeate architecture (Chayka 2020).

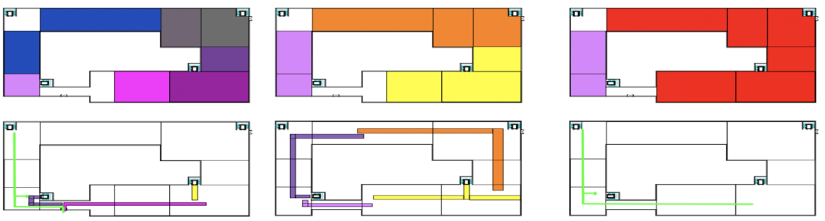

Figure 1 – Care unit for COVID-19. Zoning and circuits of employees, users and visits (design Jéssica Liane, 2020)

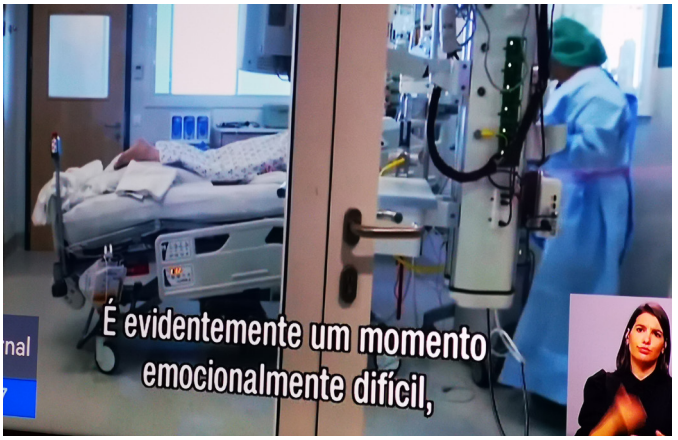

Figure 2 – Hospital in France adapted to the covid-19 pandemic with central and side service corridor (for visitors and medical personnel with protective equipment). Image from the TV news broadcast by RTP1, March 2020).

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