

## Systemic Design for Health

Infectious Diseases Prevention and Control

### International Multidisciplinary Summer School

KU Leuven Faculty of Architecture & Thammasat Design School  
in collaboration with WHO Téchne

Thammasat Rangsit Campus, Bangkok, 16 – 30 July 2022



**KU LEUVEN**

This interdisciplinary summer school is jointly organized by KU Leuven Faculty of Architecture and the Thammasat Design School in collaboration with **WHO-Téchne** (<https://www.who.int/groups/techne>). Téchne will use the outputs of the summer school to learn how ventilation, temperature, humidity, and daylighting control strategies are used for Infection Prevention and Control (IPC) in the context of mainland Southeast Asia. The summer school outputs may also provide an entry point for design studios and/or electives in the participating universities.

## Framework of the Summer School

### Background

Epidemics of infectious diseases are occurring more frequently and are spreading faster and further than ever before in different regions of the world. Climate change, high population pressure expanding to previously uninhabited areas, unplanned urbanization and growing global interconnectedness has led to increased occurrences of emerging and re-emerging infectious diseases including zoonoses with the potential to rapidly spread across the globe.

Since 1970, more than 1,500 new pathogens were discovered, of which 70% proved to be of animal origin. Not all of them have had a public health impact but some became notorious: these include the Ebola virus (1976) and the Human Immunodeficiency Virus or HIV (1983).

At the same time, old diseases such as cholera, plague, and yellow fever keep re-emerging — about 40 outbreaks of cholera are reported to WHO every year—while new ones are identified.

In these first two decades of the 21<sup>st</sup> century, the world has been repeatedly reminded of the degree to which people in all countries and on all continents remain chronically vulnerable to infectious diseases, both known and unknown.

In 2009 a novel influenza virus, the H1N1, started to spread, resulting in the first influenza pandemic of the 21<sup>st</sup> century. Ten years later, a cluster of pneumonia cases were reported in Wuhan, China and a novel coronavirus was eventually identified. On 30 January 2020, the virus was declared a Public Health Emergency of International Concern (PHEIC), the sixth time WHO declared a PHEIC since the International Health Regulations came into force in 2005 -- and on 11 March 2020, deeply concerned by the alarming spread and severity as well as by the levels of inaction, WHO declared COVID-19 a pandemic.

As diseases very rarely disappear, a potentially fatal combination of newly-discovered diseases, and the re-emergence of long-established ones, demands for urgent preparedness measures and responses to enable efficient response in all countries.

### **Planning and preparation for epidemic prevention and control are essential.**

The COVID-19 pandemic has necessitated the compulsory use of face masks and physical distancing, lockdown measures for lengthy periods, and restricted access to regions and even entire countries. Creating the possibility to isolate patients in health care facilities became an absolute priority, as did the isolation of infected patients at home and large-scale vaccination programs.

While a disease-specific treatment unit, such a Severe Acute Respiratory Infection (SARI) treatment centre, usually requires major rehabilitation work to be converted to other purposes, the development of a proposed Multiple Diseases Treatment Center, as a new building typology for IPC, could offer the flexibility needed to be allocated to other functions with minimal or no efforts.

Built nearby a level three hospital during the preparedness phase, it could potentially be turned into an infectious disease ward for tuberculosis (TB) or other respiratory diseases thanks to the ventilation system established. It could also be assigned to intensive care units (ICU) due to the high standards of infection control engineering measures available or may even be used as an isolation ward or research facility with integrated laboratories.

Isolation, indoor temperature control and indoor ventilation are among the significant lessons learnt from this pandemic. Understanding and controlling building ventilation can improve the quality of the air we breathe, reduce the risk of indoor health concerns, and prevent the virus that causes COVID-19 from spreading indoors. This is even more important in conditions where air pollution and other environmental factors such as urban heat island effects, subsidence, floods, typhoons, etc. are prevailing.

The World Health Organization (WHO) has published numerous recommendations or measures to prevent the spread of COVID-19. The *'Roadmap to improve and ensure good indoor ventilation in the context of COVID-19'* provides guidelines on good ventilation in indoor settings, including healthcare facilities, and non-residential and residential settings.

## Outline of the summer school

### Objectives:

- Participants will develop ideas for a multiple disease treatment center focusing not just on isolation units but on creating a safe care environment centred around patients, families, and communities. The multiple disease treatment center will be able to adapt to inner-city built areas, peri-urban informal settlements, and rural settings and will be resilient to the most common natural hazards occurring in the region
- Learning from regional building typologies and strategies to increase ventilation and control indoor temperature, relative humidity, as well as natural daylight, participants will ensure the use of natural ventilation to meet airborne precaution standards and local construction materials for temperature control. Both strategies allow for the reduction of running costs and enable long term environmental sustainability.
- Coordinators and instructors will jointly document the process of interdisciplinary collaboration to develop guidelines for similar exercises.

### Format & Methodology:

#### Stage 1: Introduction - Understanding Best Practices

The summer school will draw on the '*Roadmap to improve and ensure good indoor ventilation in the context of COVID-19*' as presented by WHO-Téchné. Participants will understand IPC measures as per the roadmap recommendations and strategies. Moreover, participants will review best practices in the Southeast Asian region.

#### Stage 2: Analysis + Systems Thinking

Participants then will be introduced to a holistic way to handle complexity through systems thinking and coached through successive phases of analyses towards a visual representation of their findings, such as a systems map. As part of this process, they will be divided into subgroups, where they will visit one of the real-life study areas (i.e., inner-city built-up areas, peri-urban informal settlements, and rural settings). A series of workshops will enable each group to identify high-leverage interventions.

#### Stage 3: Design Thinking

An introduction to design thinking will then guide participants to develop ideas for a multiple disease treatment center focusing not just on isolation units but on creating a safe care environment centered around patients, families, and communities. The proposed center will be able to adapt to inner-city built-up areas, peri-urban informal settlements, and rural settings and will be resilient to the most common natural hazards occurring in the region. Through workshops, groups will collaborate to define the key criteria and strategies for this new building typology in various ways.

#### Stage 4: Conclusion - Final Presentation

The outputs of stages 2 and 3 will be prepared for the final presentation that will be held in the presence of faculty members and invited guests. Participants will have an opportunity to integrate received feedback afterwards.

### Expected outputs / Results:

*WHO Téchne & Course Outputs:* For each of the three groups: ideas for a multiple disease treatment center. The proposal can vary from a descriptive matrix (criteria and design principles of a building) to a building typology design to increase ventilation and control indoor temperature, relative humidity, as well as natural daylight. The proposal will ensure the use of natural ventilation to meet airborne precaution standards and local construction materials for temperature control.

*WHO Téchne & Academic Output:* Documentation of the process of interdisciplinary collaboration between students and instructors (possibly to be processed as a research article).

## **Logistics of the summer school**

### Responsibilities

- Workshop Coordinator: Koen De Wandeler (Assoc. Prof, KU Leuven Faculty of Architecture)
- Course coordinator: Dr. Adrian Lo (International Expert, UDDI, Thammasat Design School)
- Resource Persons:
  - Asan Suwanarit (Dean, Thammasat Design School)
  - Fa Likitswat (Asst. Prof, Landscape Architecture, Thammasat Design School)
  - Dr. Isaac Jamieson (Associate Director, DBTM, Thammasat Design School)
  - Bruno Depre (Instructor, WHO-Téchne elective instructor, KU Leuven)
  - Dirk Jaspaert (Instructor, WHO-Téchne elective instructor, KU Leuven)
  - Anna Silenzi (Architect, WHO-Téchne)
  - Michele Di Marco (Coordinator, WHO-Téchne)
  - Other resources person to be confirmed
- Instructors:
  - Koen De Wandeler (Assoc. Prof, KU Leuven Faculty of architecture)
  - Dr. Adrian Lo (International Expert, UDDI, Thammasat Design School)
  - Dr. Isaac Jamieson (Associate Director, DBTM, Thammasat Design School)
  - Other instructors to be confirmed

### Partners

KU Leuven Faculty of Architecture, Thammasat Design School (Thammasat University, Thailand), WHO-Téchne, others to be confirmed

### Calendar

The summer school will consist of on-site explorative research and fieldwork, combined with lectures, charettes, working sessions, reflection moments and presentations at the Thammasat Design School (TDS). The summer school is conducted in English.

Arrival: before 12 noon on July 16<sup>th</sup>, 2022

Summer school: July 16<sup>th</sup>-30<sup>th</sup>, 2022

Leaving: July 31<sup>st</sup>, 2022

*Late arrival or early leave will not be accepted.*

On-campus accommodation will be provided for international students and for those coming from other provinces

### Application and Deadline

Interested candidates should send their CV and a motivation letter describing how their academic and/or professional background and experiences match the program as well as how they could benefit from doing this program (300 words maximum in English) to [koen.dewandeler@kuleuven.be](mailto:koen.dewandeler@kuleuven.be) AND to [alo@ap.tu.ac.th](mailto:alo@ap.tu.ac.th)

- **Eligibility:** Candidates should be starting Bachelor's Year 3 and upwards as of August 2022 (Semester 1 of 2022-23 academic year). Given the stimulating yet complex configuration of the summer school challenge, Master's and doctoral students, researchers and fresh graduates especially are encouraged to apply. Applicants' disciplinary backgrounds can be in architecture and built environment (landscape architecture, urban design and urban planning, interior), engineering, healthcare, environmental science, emergency management, economics, and management.
- **Availability:** 30 participants (approximately)
- **Responsibility:** All participants are personally responsible to obtain all legal documents and permits to travel and stay in Thailand (including COVID-19 documents required by 16 July. The Thai Pass may be dropped by then, but the wearing of face masks in public places may still be required. Adhere to government regulations and updated information about pandemic measures.
- **Transportation:** International travel is at the expense of participants. TDS can arrange transportation of 5 – 10 persons from Suvarnabhumi airport, Don Meuang airport and Chatuchak Bus Station upon request. Local transportation for field visits and cultural tours will be organized by TDS.
- **Accommodation:** Accommodation will be provided for a maximum of 15 students.
- **Validation:** All participants will receive a Certificate of Participation upon successful completion of the summer school. Thammasat University students can validate their participation in the *DBT 417 Special Issues in Design: Design Thinking and Health* (3 credits) for the 2022-23 academic year. KU Leuven Faculty of Architecture students can validate their participation by enrolling for the *ELBG 1 Participation in an International Project* (5 ECTS) for the 2022-23 academic year.

**Deadline for application: June 20th, 2022.**

Confirmation of acceptance: June 24th, 2022.

Deadline for registration payment & written final commitment: June 28th, 2022.

**Given the current condition of the COVID19 outbreak, the summer school is organized with precautions. We explicitly stress the importance of not incurring any expenses to attend this summer school (i.e., not to buy flight tickets or make reservations for accommodation) until notice of acceptance is sent. Up to date entry requirements will be sent along with the notice of acceptance.**