# Designing during, and for Pandemics

## A multidisciplinary approach

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## Abstract.

COVID-19 pandemic may have captured our attention over the last months, but there are several pandemics currently active. Understanding the nature of a pandemic and learning how to design for, and during a pandemic is more than a contemporary need. In this workshop we will introduce the stages of a pandemic using a public health perspective, and together with the participants, we will reflect on designing for each stage and different potential stakeholders. The aim of the workshop is to explore how we design during pandemics such as COVID-19 and how these situations can influence the design of previously developed health and wellbeing related solutions, as well as our practices as designers. The objectives are to: (1) gain understanding regarding infectious outbreaks, (2) explore design opportunities and challenges during rapidly changing contexts, (3) reflect on the effect of a pandemic on the design process. The benefits of this multidisciplinary workshop are multiple, some of which are: understanding of the pandemic, familiarizing with design tools suitable for designing through pandemics, and exploration of ideas on designing for and during pandemics.

**CCS CONCEPTS**

Human-centered computing, HCI theory, concepts and models

## 1 Introduction

Pandemics are a sudden increase in the number of cases of a specific disease above the expected, which spread over several countries or continents, affecting a massive number of people [4]. Until recently, we only thought of pandemics as things of the past, like the Spanish flue or the black plague. Nowadays, the whole world got to experience firsthand the COVID-19 pandemic, bringing the importance of infectious outbreak management front and center. However, COVID-19 is not the only pandemic currently active: Tuberculosis kills millions of people every year, HIV/AIDS and Malaria kill hundreds of thousands per year, etc. [4]. Designing digital health solutions that can adapt to such world changing events is very much a current issue.

In the face of a massive outbreak or pandemic, stakeholders such as government agencies and healthcare systems, begin strategic planning following well described response protocols from established agencies such as the World Health Organization (WHO) and the Centers for Disease Control and Prevention (CDC). The basic principles behind these

protocols include planning and coordination, situation monitoring and assessment, reducing the spread of disease, continuity of health care provisions, and communications [3]. Unfortunately, no specific guidelines and considerations exist for other stakeholders such HCI researchers and practitioners so that they can mount their own strategic responses to a pandemic.

As HCI researchers and practitioners working on the health and wellbeing domain, it is important to understand pandemics, how to support stakeholders during the phases of a pandemic, and how to work on designing and developing health and wellbeing solutions during a pandemic. A pandemic influence both the user and their society. Designing technology during, and for these circumstances, requires a multidisciplinary approach in order to safely support people and societies, as well as rapidly adjust ongoing or already developed applications [1]. For example, an application for motivating people to stay physically active may need to be (re)designed to accommodate physical activity during a pandemic. Moreover, the methods we use for designing and evaluating technological artifacts (software/hardware) may need adjustment based on the pandemic stage. In circumstances where contact with users is restricted, new methods may need to be adopted or created to still perform research to understand the users' needs, values and wants [2].

Taking epidemiological and design science notions, we created a conceptual matrix that summarizes the different stages a society will go through during a pandemic. In general terms, the matrix proposes four distinct stages with space for overlapping throughout the time continuum. **In this workshop**, we want to explore, together with the participants, the design space for the different stages and different stakeholders e.g. user, government, and companies. In the workshop, we will present (1) the matrix of the pandemic stages as well as (2) some examples of technology that could support one or more stakeholders during a pandemic and (3) how an already existing design can be enriched to address emerging and changing needs in the different stages of a pandemic. Then, together with the participants we will reflect on designs for different stakeholders in each stage and relevant methodologies related to user research, user participation, and evaluation.

## 2   Scheduled overview of planned activities

Following We plan for a full day workshop (about 6 hours and lunch) in which together with the participants (10-20) we will explore the different stages of a pandemic and how they influence our design and design decisions.

A selection of relevant literature will be made available before the session to be used as learning material in a Mendeley group, which will include definitions, design aspects, foundational epidemiological concepts and patient empowerment contents. Participants will be invited to contribute to the collection by adding new content to the Mendeley group. Presentation slides and resulting materials will be freely available in SlideShare.

The participants will be requested to read the selected papers before attending the workshop and asked to submit an opinion paper about their experience in designing for wellbeing and health in which they will discuss how the pandemic influence their work.

The workshop will start with an introduction of the organizers and the participants as well as the participants expectations. Followed by a 30 minutes discussion of the submitted papers, grouping the topics and issues according to their level of interest. The organizers will share their experiences on designing for health and wellbeing and describe the different stages of a pandemic with relevant design cases. The participants will then be divided into groups of 3-5 matching their own interests.

The remainder of the workshop will utilize two approaches: case-oriented vs context-dependent. During the case-oriented approach, participants will explore the design space of the different pandemic stages and design digital solutions that fit the stage-specific needs; they will work on visualizing their results with high-level through sketches, storyboards, scenarios or other visual/textual means. The context-dependent approach will then shift the focus of the exploration to a reflective state in which participants will delve on how a pandemic context would influence their design process, focusing on what methods could be used and how commonly used design methods can be adjusted to facilitate user-centered or participatory design.

# 3 A draft of the call for workshop participation

The COVID19 pandemic is not such an exceptional situation as we may think. Pandemics may seem a past thing, but they are actively present, sometimes silently killing millions. Tuberculosis kills millions per year, HIV/AIDS and malaria kill hundreds of thousands. As most of us have now experienced a pandemic, it is time to utilize our experience and reflect on how a pandemic influence new and past designs of technology.

**In this workshop** you will have the opportunity to get a short introduction on designing for health and wellbeing and understand the pandemics through the public health perspective. We will provide you with a matrix of the different stages of the pandemic and we will discuss how HCI can support each stage and how each stage of the pandemic influence HCI. We will address the different stages of pandemics through a bottom-up approach and discuss the ways in which the design processes and tools can be affected by it. You can be a researcher or a practitioner as both insights are valuable.

**For participating** in the workshop, you will need to submit an opinion paper of maximum two pages long (not including references) in the ACM format. The paper should be related to designing for health or wellbeing and it should handle one or more of the following:

- Ways in which the pandemic has influenced your work as a designer regarding user research, prototyping, and evaluation.
- Lessons learned while designing during the pandemic or adjusting products because of the pandemic
- How the pandemic has influenced the needs of your users or stakeholders
- A design case visualizing the influence of the pandemic in the design process
- A case on how the design aimed to solve a specific situation cause by the pandemic

A selection of relevant literature will be made available before the session to be used as learning and inspirational material in a Mendeley group. Participants' opinion papers will be added to this collection. You are expected to read the opinion papers of the other participants before the workshop so we can have a productive discussion.

Important dates

- September 15th submission of the opinion papers
- October 1st notifications of acceptance

We will accept up to 20 participants so the size to be manageable even if the workshop is moved online. The fitness of the opinion paper will be used as selection criteria for participation in the workshop. Gender balance and cultural diversity will be used as additional criteria. See table 1 for the detailed schedule.

**Table 1: Timetable for the workshop**

| Duration in min. | Description of the activity |
|---|---|
| **15-30** | Introductions and expectations |
| **15-30** | Discussion on the submitted papers |
| **10** | Insights on designing for wellbeing and health |
| **10** | **Break** |
| **20** | Pandemic design framework presentation |
| **60** | Exploration and design for a pandemic stage: Scenario 1 |
| **45** | **Lunch** |
| **60** | Reflection on context and how it affects the design process |
| **10** | **Break** |
| **60** | Exploration and design for a pandemic stage: Scenario 2 |
| **10** | **Break** |
| **60** | Reflection on context and how it affects the design process |
| **10** | **Break** |
| **30** | General discussion and exploration of future cooperation |

[Organisers' pictures and background]

## 4  The promotional strategy

We will promote the workshop in our universities, collaborative universities, and national research facilities where we have access to mailing lists of people interested in HCI as well as to non-academic collaborators such as companies, and associations. Both of us have connections to international networks such as Marie Skłodowska Curie Innovative Training Networks (ITN) and European Cooperation in Science and Technology network (COST), through which we can disseminate the information about the workshop. Having pre-event content such as literature collection in a Mendeley group and presentation slides in Slideshare will facilitate the promotion of the workshop through social media channels. Social media such as LinkedIn, Facebook, and Twitter will be used to promote the workshop as well as other digital means such as blog posts, and our universities' public channels. The workshop will also have its own website: https://design4pandemics.wixsite.com/design4pandemics

## 5  Organizers' background

Interactivity is essential for learning in such multidisciplinary topic. The organizers have extensive experience in arranging lectures, panels and workshops in multidisciplinary environments in forums such as medical informatics conferences, design science events, and others.

**Dr. Guido Giunti** is a medical doctor specialized in mHealth solutions for patients with chronic conditions. He is the co-founder of the TEDxUBA event in Argentina, which under his guidance grew to host over 1500 attendees. Dr Giunti's research has received numerous awards and merits, including a Marie Skłodowska Curie grant in 2015 and the Finnish Best Doctoral Dissertation award in his field in 2019. Further, his scientific findings been reported in TV, radio and newspapers around the world. Dr. Giunti is Adjunct Professor of Digital Health Design and Development at the University of Oulu (Finland) and a postdoctoral researcher at TU Delft (Netherlands).

**Vasiliki Mylonopoulou Ph.D.** is a Marie Skłodowska Curie alumnus with experience in designing technology for health and wellbeing related to behavior change by using social influence/comparison. Her background is in engineering and human-computer interaction and her Ph.D. thesis resulted in a design tool that can be used by practitioners in designing social aspects in health and wellbeing technology. Due to her involvement on raising awareness on neurodevelopmental disorders and alternative ways of teaching and learning, she was nominated and awarded the diversity and equality award by University of Oulu (Finland) in 2019. Currently she works at University of Gothenburg (Sweden) in the division of Human-Computer Interaction on designing technology in service to people's diverse social, mental, and physical needs.

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