

## Redefining health care after the pandemic: A mixed-methods survey with chronically ill patients

Theodora Oikonomidi,<sup>1,2</sup> Philippe Ravaud,<sup>1,2,3</sup> Diana Barger,<sup>4</sup> Viet-Thi Tran<sup>1,2</sup>

1. Université de Paris, CRESS, INSERM, INRA, F-75004 Paris, France
2. Clinical Epidemiology Unit, Hôtel-Dieu Hospital, Assistance Publique-Hôpitaux de Paris, (AP-HP), 75004, Paris, France
3. Department of Epidemiology, Mailman School of Public Health, Columbia University, New York, NY, USA
4. Univ Bordeaux, ISPED, Inserm Bordeaux Population Health, team EMOS, UMR 1219, CIC-EC 1401, F-33000, Bordeaux, France

## Background

The COVID-19 pandemic and associated lockdown measures have disrupted the traditional model of care. During lockdown, non-urgent, in-person consultations were rescheduled or replaced with teleconsultations, patients with COVID-19 were confined at home and monitored remotely, and symptom-checker websites were created to triage possible cases.<sup>1-4</sup> For some chronically ill patients this may have been a welcome departure from the traditional model of care, which is built around infrequent, in-person consultations and is costly to health care systems and burdensome to patients.<sup>5,6</sup>

Studies have reported high patient satisfaction with modified care services provided during lockdown.<sup>7,8</sup> This has even translated rapidly to concrete political action (e.g., new legislation to expand Medicaid coverage for telephone consultations after the pandemic in the United States) and to calls for post-pandemic blended care models.<sup>9</sup> Blended care models would combine modalities of in-person- and remote-care into a hybrid designed to fit the needs of each patient.<sup>9-11</sup>

For chronically ill patients who invest significant amounts of time and effort in health care,<sup>5</sup> blended care models could alleviate treatment burden or “the health care workload associated with everything they do to care for themselves and its impact on their well-being”.<sup>12-14</sup> For example, replacing some in-person consultations with teleconsultations reduces travel and waiting times, which “cost” patients 77 minutes for a single health consultation.<sup>15</sup> The benefits could be substantial, particularly for patients who face barriers accessing in-person care (e.g., patients with limited mobility, patients who are informal caregivers).

The blended care model is not without drawbacks. Teleconsultations, based almost entirely on verbal communication, may be inaccessible for non-native speakers or people with disabilities such as hearing loss. Remotely-delivered interventions may differ substantially from their in-person counterparts, leading to the need to assess which interventions can be delivered remotely without reducing the quality of care (e.g., in remote physical exams, the patient takes an active role in self-examination replacing the physician; some therapy components delivered by psychotherapists differ between in-person and remote therapy sessions).<sup>16</sup> Finally, blended care models inevitably lead to hybrid patient-physician relationship, where the correct balance between in-person communication and technology-mediated interaction remains unknown.<sup>10</sup>

There is little doubt that the traditional model of care will undergo a transformation following the profound disruption caused by the pandemic. This disruption offers a unique opportunity to co-develop the future of health care with patients, re-affirming the commitment

of the health care community to its patient-centered core.<sup>17</sup> The first step in that direction is to undertake exploratory research, aiming to understand patients' vision of post-pandemic care, and quantify their perceptions of blended care models. For this purpose, we will do a mixed-methods survey to identify how chronically ill patients envision post-pandemic, blended care models.

## Methods

### Participants

We will recruit patients with any chronic condition from the ComPaRe citizen science project (<https://compare.aphp.fr/>). ComPaRe participants have accepted to be contacted with invitations to participate in research to advance care for their condition. Participants provide electronic informed consent for their participation in future surveys upon entering the cohort. ComPaRe has been reviewed by the Institutional Review Board of Hôtel-Dieu Hospital in France (IRB 0008367) and is registered with the French National Data Protection Institute (CNIL).

An email invitation to participate in the study will be sent to cohort participants and two email reminders will be sent to non-responders three and ten days later.

### Data collection

Demographic and illness-related data (i.e., age, sex, education level, number of chronic conditions, treatment burden) are not included in the survey because they are routinely collected on ComPaRe.

#### *Part 1: eliciting a qualitative description of the blended care model*

First, participants will be shown a list of: a) technologies used to deliver care during lockdown (e.g., phone calls, chat-bots), b) uses of these technologies (e.g., to do regular consultations, to monitor and transmit health data to one's physician), and c) other forms of care reorganization (e.g., reducing consultation frequency, task-shifting among health care professionals). The list will be presented in two ways: verbally, in a short video by one of the authors (V.T.T.), and shown in writing on the survey webpage.

One of the authors (T.O.) developed this list based on published systematic reviews. Briefly, we searched Pubmed for published systematic reviews synthesizing the evidence on technology-based reorganization of care during the COVID-19 pandemic. We then followed pre-specified eligibility criteria to identify relevant systematic reviews. Finally, we did qualitative data extraction from the results sections and the summary tables of all eligible

systematic reviews, to obtain a list of the elements of care reorganization implemented during the pandemic. The literature review process is described in Appendix 1.

After familiarizing themselves with this list, participants will be asked to imagine how components from their regular, pre-pandemic care and from the care delivered during lockdown can be combined to produce their ideal care, defined as the best possible care based on their needs and preferences.

Participants will be asked two open-ended questions to identify components of patients' ideal post-pandemic care:

- “Imagine the ideal care for you, in the long term. In which ways would it be different from the regular care you received before the pandemic?” [Question 1]
- “How would the innovations that were implemented in health care delivery during the pandemic help you obtain this ideal care?” [Question 2]

These questions aim to elicit specific suggestions from participants. We therefore developed them following counseling techniques used in brief solution-focused psychotherapy to help clients brainstorm specific solutions instead of focusing on existing problems.<sup>18</sup>

### *Part 2: quantitative assessment of blended care*

On the second part of the survey, we will present patients with three situations in which blended care models could be implemented by mixing regular-care modalities and pandemic-care modalities. For each situation we will ask participants to indicate the ideal balance between the two modalities, as a proportion. The three clinical situations are:

1. attending consultations with one's physician (blend of teleconsultations and in-person consultations),
2. receiving recommendations on managing one's symptoms (blend of using online symptom-checkers and contacting one's physician), and
3. communicating one's monitoring data to their physician to adapt their treatment (blend of remote monitoring and sharing data in in-person consultations with one's physician).

Below is the example of the question for situation 1:

“Imagine that after the end of the pandemic, you could use teleconsultations for the management of your chronic illness. We would like to know what **the ideal balance** would be for you, between teleconsultations and in-person consultations.

- a. For what proportion of your future consultations, would you choose to use **teleconsultations**? *Your remaining consultations would be in-person.*” [0 to 100% sliding scale, labelled: “None of my consultations” to “All of my consultations”]

An optional open-ended question will inquire as to the reasons why participants selected the proportion in their response. Finally, for each situation, participants will be asked whether they have used the pandemic-care modalities before the pandemic and during the pandemic.

The survey will be pilot-tested by using cognitive interviewing with 3 patients with chronic illnesses (a 26-year-old woman with major depressive disorder, a 20-year-old woman with type 1 diabetes, and a 57-year-old woman with hypothyroidism). Their feedback will be used to modify the survey if needed.

### Data analysis

The primary objective of this study is to collect qualitative data describing patients’ perspectives of blended care models. Therefore, all surveys with responses to questions 1 and 2 will be included in the analysis. We will provide the participation rate using a flow chart and we will present the demographic data of non-participants, which are routinely collected in the ComPaRe cohort. We will perform all analyses on a weighted data set obtained by calibration of our data with weights for age, gender and educational level, derived from national census data describing the French population with chronic conditions.

### *Qualitative data analysis*

We will follow content analysis to code the responses to all open-ended questions. The aim of the analysis is to produce a description of how patients envision the post-pandemic, blended care model, from the data collected in questions 1 and 2.

First, a preliminary coding scheme will be developed by two authors (T.O. and D.B.) based on previous literature on patients’ suggestions for improvements in health care,<sup>19,20</sup> and data collected in piloting the study with 5 participants from ComPaRe.

Second, 20% of responses will be independently coded by T.O. and D.B. using the preliminary coding scheme. Both coders are fluent in French and have experience in content analysis with interview, focus group, and survey data. Both coders have worked in health services research with people with chronic illnesses and one coder is a person with chronic illness and multimorbidity. The authors will meet frequently to discuss and consolidate codes, creating new ones as needed. Based on these codes, an initial codebook will be developed containing a definition and verbatim examples for each code.

Third, this codebook will be used by T.O. to code the remaining responses, adding new codes if needed. When all responses have been coded, the authors will meet to hierarchically organize the codes, so that codes describing similar concepts are clustered into overarching themes. Frequency will be calculated as the number of participants who reported each code.

Data collected in the optional open-ended questions will be analyzed using the same process to obtain a list of reasons motivating patients' assessment of the ideal balance between pre-pandemic and post-pandemic care, which will be presented separately for the three clinical situations.

### *Quantitative data analysis*

For each clinical situation, we will present the median proportion at which the blended care model would be made up of care modalities used in lockdown, according to patients' preferences. We will also present this outcome in a subgroup analysis (participants who have used the care modality used in lockdown for each situation, versus participants who have not used it). For each situation, we will present the proportion of patients whose ideal blended care would be made up of >50% or >75% of the care modality used in lockdown. Missing data will be handled by using multiple imputation.

### *Sample size*

The primary objective of this study is to achieve data saturation in the qualitative analysis of patients' perspectives of post-pandemic care. Therefore, we aim to collect as many responses as possible to questions 1 and 2. To determine whether additional data collection could lead to the detection of further themes in our qualitative analyses, we will estimate the degree of data saturation by using an established predictive modelling method, after the first 100 responses have been coded, and we will adjust recruitment accordingly.<sup>21</sup>

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## Appendix 1: Literature review to elicit components of care reorganization

We followed standard literature review methods to identify components of technology-based care reorganization implemented during the COVID-19 pandemic.

First, we searched Pubmed on December 2 2020 using the following search strategy:

#7	#4 AND #5 AND #6
#6	#1 OR #2 OR #3
#5	"systematic review"[Publication Type] OR "systematic review"[Text Word]
#4	"covid 19"[Title/Abstract] OR "covid19*"[Title/Abstract] OR "covid 19"[Title/Abstract] OR "SARS CoV-2"[Title/Abstract] OR "2019nCoV"[Title/Abstract] OR "2019 ncov"[Title/Abstract] OR "nCoV2019"[Title/Abstract] OR "nCoV-2019"[Title/Abstract] OR "coronavir*"[Title/Abstract] OR "corona-virus"[Title/Abstract] OR "coronovir*"[Title/Abstract] OR "corono-virus"[Title/Abstract] OR "corona-virus"[Title/Abstract] OR "corono-virus"[Title/Abstract] OR "betacoronavir*"[Title/Abstract] OR "beta-coronavirus"[Title/Abstract] OR "beta-coronavirus"[Title/Abstract] OR "2019 ncov"[Title/Abstract] OR "n-cov"[Title/Abstract] OR "ncov*"[Title/Abstract] OR (("virus"[Title/Abstract] OR "viruses"[Title/Abstract] OR "viral"[Title/Abstract]) AND "wuhan*"[Title/Abstract]) OR (("virus"[Title/Abstract] OR "viruses"[Title/Abstract] OR "viral"[Title/Abstract]) AND "covid*"[Title/Abstract]) OR "COVID-19 diagnostic testing"[Supplementary Concept] OR "covid 19"[Supplementary Concept] OR "severe acute respiratory syndrome coronavirus 2"[Supplementary Concept]
#3	("reorganization"[Title/Abstract] OR "remote*"[Title/Abstract] OR "distance"[Title/Abstract] OR "video*"[Title/Abstract]) AND ("care"[Title/Abstract] OR "healthcare"[Title/Abstract] OR "health care"[Title/Abstract] OR "consult*"[Title/Abstract] OR "appointment*"[Title/Abstract])
#2	("monitoring"[Title/Abstract] OR "surveillance"[Title/Abstract]) AND "remote*"[Title/Abstract]
#1	("social media"[Title/Abstract] OR "Facebook"[Title/Abstract] OR "Whatsapp"[Title/Abstract] OR "Youtube"[Title/Abstract] OR

<p>"Skype"[Title/Abstract] OR "Twitter"[Title/Abstract] OR          "WeChat"[Title/Abstract] OR "Weibo"[Title/Abstract] OR          "SMS"[Title/Abstract] OR "short messaging service"[Title/Abstract] OR "text          messages"[Title/Abstract] OR "text messaging"[Title/Abstract] OR          "virtual"[Title/Abstract] OR "online"[Title/Abstract] OR "web          based"[Title/Abstract] OR "web delivered"[Title/Abstract] OR "web          platform"[Title/Abstract] OR "smartphone"[Title/Abstract] OR          "internet"[Title/Abstract] OR "wearable*"[Title/Abstract] OR          "telephone*"[Title/Abstract] OR "phone*"[Title/Abstract] OR          "digital"[Title/Abstract] OR "m health"[Title/Abstract] OR          "mhealth"[Title/Abstract] OR "e health"[Title/Abstract] OR          "ehealth"[Title/Abstract] OR "conversational agent*"[Title/Abstract] OR          "chatbot"[Title/Abstract] OR "artificial intelligence"[Title/Abstract] OR          "telecare*"[Title/Abstract] OR "telehealth*"[Title/Abstract] OR          "telemedicine*"[Title/Abstract] OR "telepsychiatry"[Title/Abstract] OR          "telerehabilitation*"[Title/Abstract] OR "tele-care"[Title/Abstract] OR "tele-          health"[Title/Abstract] OR "tele-medicine"[Title/Abstract] OR "tele-          psychiatry"[Title/Abstract] OR "tele-rehabilitation"[Title/Abstract]          OR "technolog*"[Title/Abstract] OR "self triage"[Title/Abstract] OR "symptom          checker"[Title/Abstract] OR ("messag*"[Title/Abstract] AND          ("platform"[Title/Abstract] OR "software"[Title/Abstract]))</p>
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One author (T.O.) selected eligible systematic reviews according to the following pre-specified criteria:

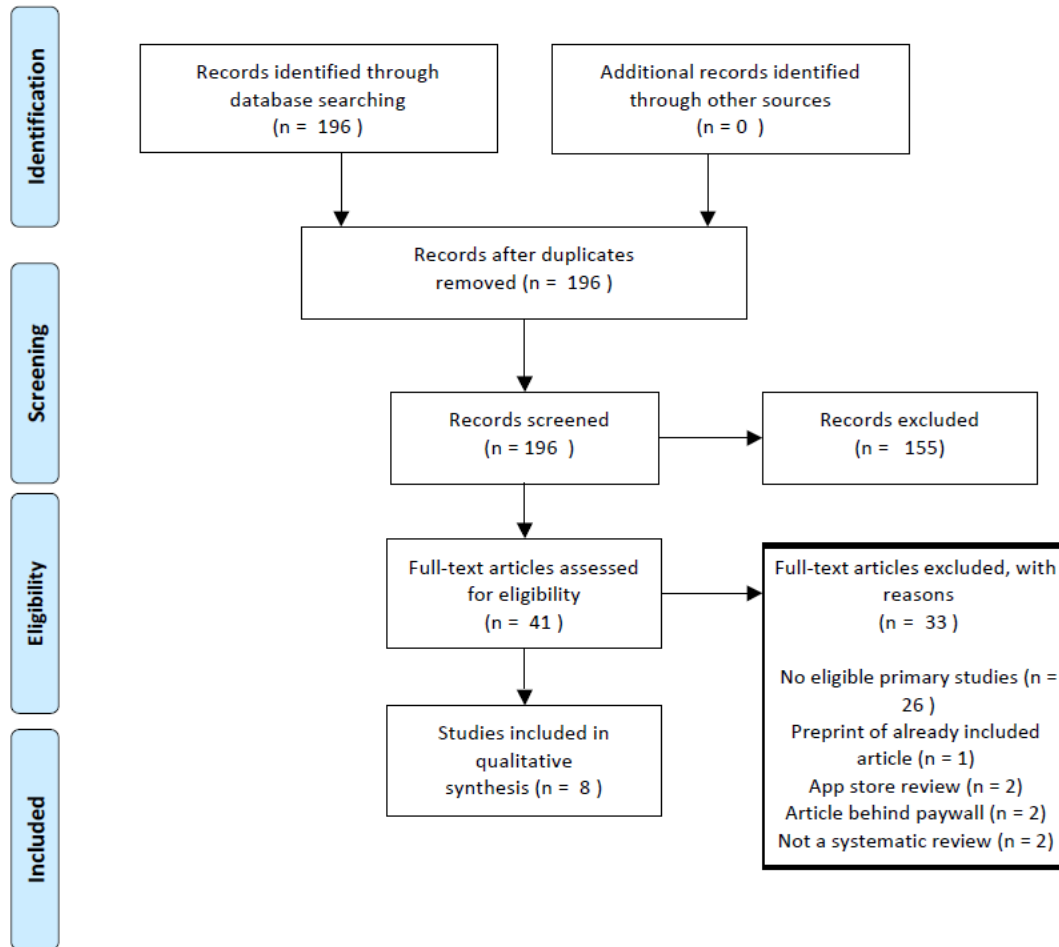
**Inclusion criteria:** Systematic reviews, including at least 1 primary study on COVID-19, including at least 1 primary study describing technology-based or non-technology-based reorganization of care.

**Exclusion criteria:** Reviews of online smartphone app stores (i.e., not including any studies), reviews including only primary studies on the diagnostic accuracy of technology-based interventions implemented during the COVID-19 pandemic.

The PRISMA flow chart is presented below:



## PRISMA 2009 Flow Diagram



The following 8 systematic reviews were included in data extraction:

1. Boyce L, Nicolaides M, Hanrahan JG, Sideris M, Pafitanis G. The early response of plastic and reconstructive surgery services to the COVID-19 pandemic: A systematic review. *Journal of Plastic, Reconstructive & Aesthetic Surgery*. 2020.
2. Davalbhakta S, Advani S, Kumar S, Agarwal V, Bhojar S, Fedirko E, Misra DP, Goel A, Gupta L, Agarwal V. A systematic review of smartphone applications available for corona virus disease 2019 (COVID19) and the assessment of their quality using the mobile application rating scale (MARS). *Journal of medical systems*. 2020 Sep;44(9):1-5.
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Qualitative data extraction was performed by one author (T.O.) by using an excel table. The author sought to identify components of technology- or non-technology-based reorganization of care from primary studies included in the systematic review, by reviewing the results section and the summary tables of the 8 included reviews. In the end, the extracted data were synthesized in a single list by comparing the extracted data across systematic reviews and merging similar components of care reorganization into a single entry. A revised version of this list, written in non-technical language, was presented to the survey participants to illustrate the concept of blended care and to encourage idea-generation.