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Letter to the Editor

# Collateral consequences of COVID-19 epidemic in Greater Paris

To the Editor,

## Introduction

The recent worldwide COVID-19 pandemic has already caused more than 90,000 deaths. It has also strongly and deeply disturbed health organizations in many countries. Most of the health care systems have been overburdened. Emergency services and intensive care units are on the frontline.[1,2] Collateral consequences of such an epidemic remain poorly evaluated.

## Methods

In France, the management of emergency patients is based on a prehospital system. The first step is the use of a unique, national, free phone number: 15 (SAMU).[3] Then, calls are managed by an emergency physician. In the case of a (suspected) cardiac arrest, the emergency physician sends a first aid team (fire-brigade usually) and an emergency physician in a mobile intensive care unit (MICU).

The number of calls we had to manage dramatically increased the days after the Italians declared the quarantine. The number of daily calls reached 6500 compared to a reference of 2000 (5 years median).

We hypothesized that, due to the saturation of the emergency medical system, alert time for cardiac arrest was delayed. Moreover, we hypothesized that due to the risk of coronavirus transmission, cardio-pulmonary resuscitation (CPR) was less frequently initiated.

Then, we compared the rate of patients with CPR initiated by witnesses (i.e. chest compressions and/or automated external defibrillation), the duration of no-flow (time between cardiac arrest and first chest compression), the time between cardiac arrest and MICU departure (including the time for the call to the emergency medical system and its management by the dispatcher), the rate of advanced life support, low-flow (time between first chest compression and return of spontaneous circulation or cardio-pulmonary resuscitation), and Day1 mortality. The year 2019 was the reference period. The COVID-period started February 24$^{th}$ (the day the number of calls exceeded the reference by 20%) until March 24$^{th}$.

**Table 1 – Comparison of the management of cardiac arrest during the COVID-period (March 2020) and the reference period (2019).**

| | Reference period 2019 | COVID period March 2020 | *p* |
|---|---|---|---|
| N | 811 | 45 | |
| Age (years) | 69 (52–82) | 66 (55–85) | 0.6 |
| Gender (M/F) | 489 (60%)/322 (40%) | 35 (84%)/10 (16%) | 0.02 |
| Asystole (%) | 687 (84%) | 38 (84%) | 1.0 |
| CPR witness (%) | 399 (49%) | 24 (53%) | 0.6 |
| AED witness (%) | 22 (3%) | 3 (7%) | – |
| CA to MICU departure (min) | 15 (7–30) | 13 (9–17) | 0.7 |
| Advanced life support | 444 (54%) | 31 (69%) | 0.06 |
| No-flow (min) | 9 (2–15) | 7 (2–11) | 0.8 |
| Low-flow (min) | 29 (15–45) | 35 (20–48) | 0.8 |
| ROSC (%) | 180 (22%) | 8 (18%) | 0.5 |
| D1 mortality (%) | 54 (7%) | 3 (7%) | – |

Results are expressed as N (%) or median (IQ).
CA: cardiac arrest/MICU: mobile intensive care unit/CPR: cardiopulmonary resuscitation/ROSC: return of spontaneous circulation/AED: automated external defibrillation.

## Results

We compared 811 patients included during the reference period vs. 45 patients included during the COVID period (Table 1). The male rate was higher during the COVID period. CPR initiated by witnesses, time between cardiac arrest and MICU departure – which is probably the best end-point to assess the impact of emergency medical system overload – as well as duration of no-flow and low-flow and return of spontaneous circulation were not significantly different.

## Discussion

The Emergency medical system overload did not significantly affect prehospital management of patients with cardiac arrest. This result is reassuring. Moreover, this trend is unclear suggesting that the effect is underestimated by a lack of statistical power. The rate of witnesses-initiated CPR was not modified. Fear of COVID-19 did not decrease the - already very low – rate of witnesses-initiated CPR. These 'real life' results strongly contrast with the current discussion about the decision to resuscitate cardiac arrest in this COVID-19 epidemic period.[4,5]

## Authors' contributions

All authors have made substantial contributions to all of the following: the conception and design of the study (FL), or acquisition of data (JMA), or analysis and interpretation of data (FL & TP), drafting the article or revising it critically for important intellectual content (FL, FA, AA), final approval of the version to be submitted (all authors).

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## Conflicts of interest

None declared.

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