

Compassionate use of scuba masks with positive pressure in patients with acute respiratory failure related to COVID-19 infection.

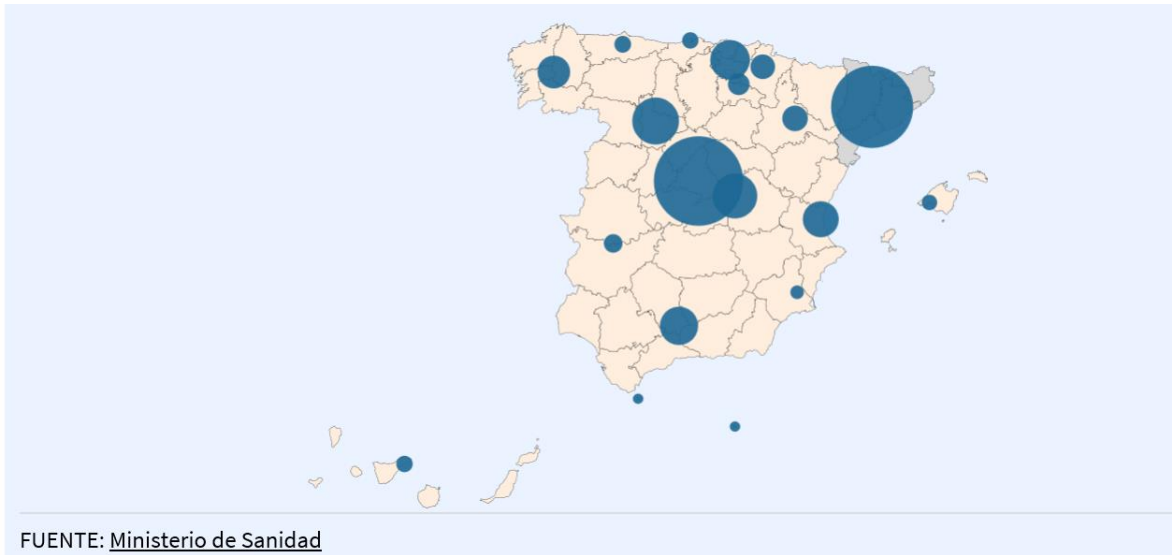
**Cada vez más cerca de las personas**



**Cruz Roja Española**

# Overview

- Urgent need
- Spanish Red Cross “Channel” – Partners ( Banco Santander, Airbus, Decathlon)- support production and distribution
- Offered as an alternative in RCRC or public system facilities in need



236.259 cases  
(26th May)

**Cada vez más cerca de las personas**



**Cruz Roja Española**

---

# Why?

- Shortage of approved devices
- Development of alternative solutions
- First response in patients with respiratory failure secondary to COVID-19 infection
- Delayed admissions to the ICU
- Accessible/Manageable (Wards, Emergency Room)



Easybreath (Decathlon)  
Duke (Cressi)

Cada vez más cerca de las personas



**Cruz Roja Española**

# How?

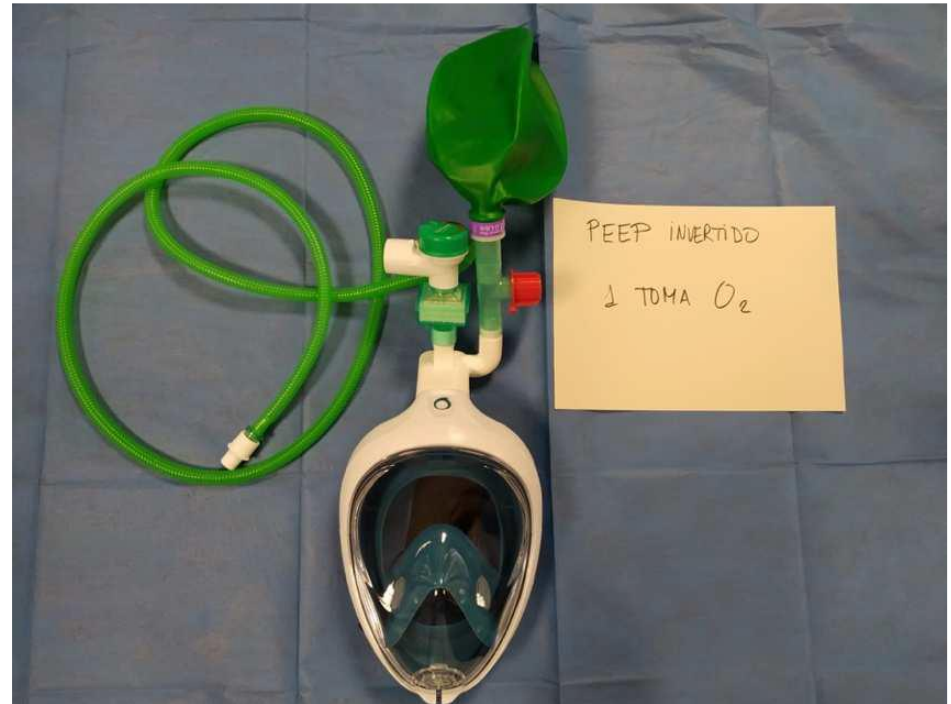
- **High O2 Flow + Positive End-Expiratory Pressure (PEEP)+ Scuba mask \***
- Autonomous respiratory system ( non electrical devices /double oxygen flowmeter)
- PEEP enough to avoid alveolar collapse with improved blood oxygen



Cada vez más cerca de las personas



# How?



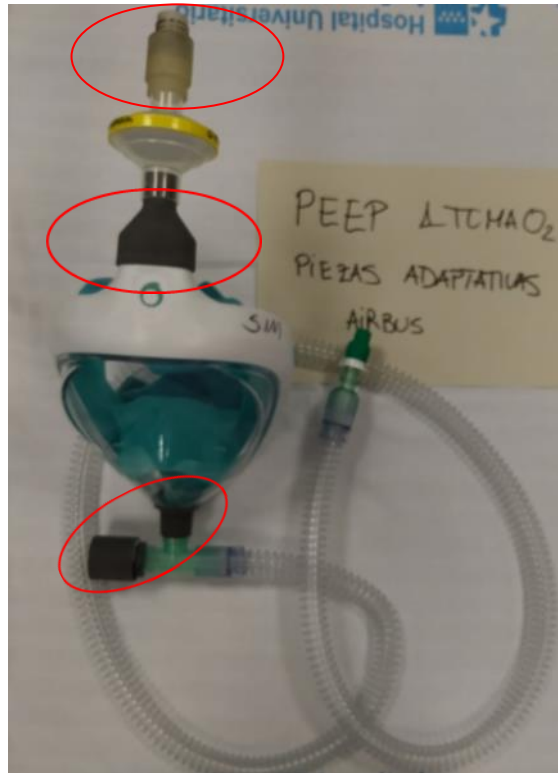
## Prototype

Cada vez más cerca de las personas



**Cruz Roja Española**

# How?



Cada vez más cerca de las personas



**Cruz Roja Española**

- Closed system (limit the dispersion of potentially contagious particles)
- Anti-suffocation valve
- Similar materials to authorized masks
- Effect on skin, eyes tested



**Cada vez más cerca de las personas**





# Initial clinical results

Sample: 22 patients

Age: 63,63 ( 19 male, 3 female)

ER: fever, dyspnea, Sat O<sub>2</sub> <93% ( 15 l/Min), x-ray COVID-19

## **Non rebreathing mask.**

Sat O<sub>2</sub>:88,5%.

Blood gas: pH 7.45; pO<sub>2</sub> 53,00; PCO<sub>2</sub> 36,80; HCO<sub>3</sub> 24,38

## **Scuba mask.**

Sat O<sub>2</sub>: 96,19% ( after 2 mins)

Blood gas: pH 7,46; pO<sub>2</sub> 81,67; pCO<sub>2</sub> 38,57; HCO<sub>3</sub> 24,55,(after 1 hour)

Cada vez más cerca de las personas



**Cruz Roja Española**

---

# Conclusions

- High pressure oxygen system is presented as an effective and safe therapeutic tool.
- Valid alternative in the context of the current exceptional situation in the absence of other approved therapeutic options.
- Low cost production.
- Good results for intermediate care (Spain/effectiveness reported from Italy).
- Homologation in process ( regulatory framework).
- Presented to ethics committees.



**Humanidad**

**Imparcialidad**

**Neutralidad**

**Independencia**

**Voluntariado**

**Unidad**

**Universalidad**



[www.cruzroja.es](http://www.cruzroja.es) 902 22 22 92