SARS-CoV-2 serological 6-months follow-up study of a hospital-based cohort of healthcare workers following 2023 COVID-19 vaccination program

5th CHRC Annual Summit

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BACKGROUND

- HCWs are a population group at high risk of acquiring SARS-CoV-2 infection due to [1]:
  - direct contact with patients (patient-to-HCW transmission)
  - contact with other HCWs (HCW-to-HCW transmission)
- HCWs can also become act as a source of in-hospital transmission [1]
- Therefore is essential to monitor these professionals in order to formulate immediate and long-term strategies to mitigate the impact of the disease in the healthcare setting [2]

[1]Grant et al. (2021), [2]Caballero et al. (2022)

OBJECTIVE

We assessed SARS-CoV-2 serological status of HCWs at a Portuguese central hospital before, three and six months after the 2023 COVID-19 booster vaccination program

METHODS

- Serological follow-up study among a cohort of HCWs from a Portuguese central hospital, with three rounds of testing:
  - **pre-COVID-19 vaccination** (September/October 2023)
  - **three months post COVID-19 vaccination** (January/February 2024)
  - **six months post COVID-19 vaccination** (April/May 2024)

- **Participants included during follow-up** ➡ underwent pre-vaccination serology & were vaccinated

- **SARS-CoV-2 spike receptor-binding domain** (anti-RBD/S) protein-specific IgG antibodies were measured (upper limit of detection 40000 AU/mL*)

- Descriptive statistics and Pearson Chi-Square test analysis were performed

*AU/mL (arbitrary units per milliliter)

RESULTS

- **All participants** at baseline had the **complete primary COVID-19** vaccination with **78,0% having received 2 additional booster** doses prior to 2023 vaccination program

Table 1. Characteristics of the HCWs included in the study at each testing moment (0, 3 and 6 months).

	0 MONTHS	3 MONTHS	6 MONTHS
n	177	62	47
median age	47,0 yrs	49,8 yrs	51,0 yrs

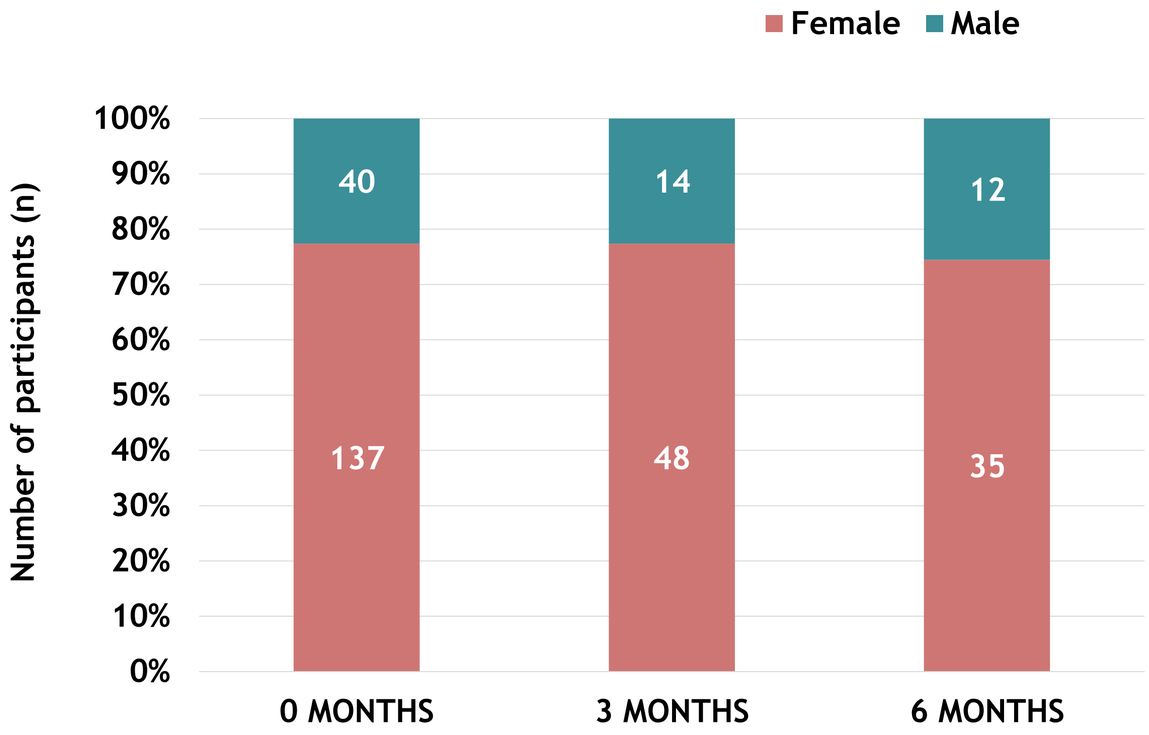
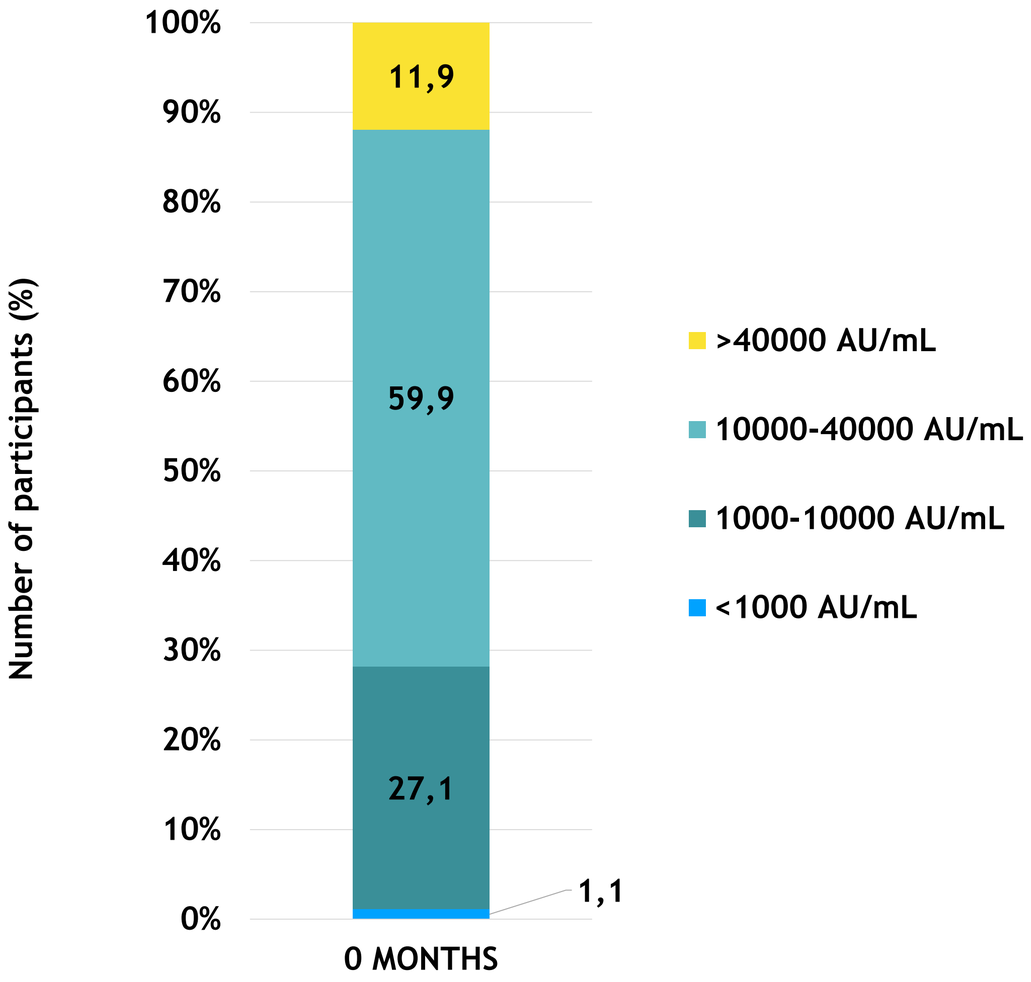


Figure 1. Participants by sex and testing moment (0, 3 and 6 months).

RESULTS



- **At 0 Months (pre-vaccination)**, all HCWs had anti-RBD/S IgG antibodies
- **71,8% (127/177)** participants had a concentration of anti-RBD/S **>10000 AU/mL**
- **11,9% (21/177)** presented a concentration **> 40000 AU/mL**
- Majority of male (67,5%) and female (73,0%) HCWs had a concentration of anti-RBD/S **>10000 AU/mL**

Figure 2. Participants stratified by anti-RBD/S concentration and testing at 0 months (pre-vaccination).

RESULTS

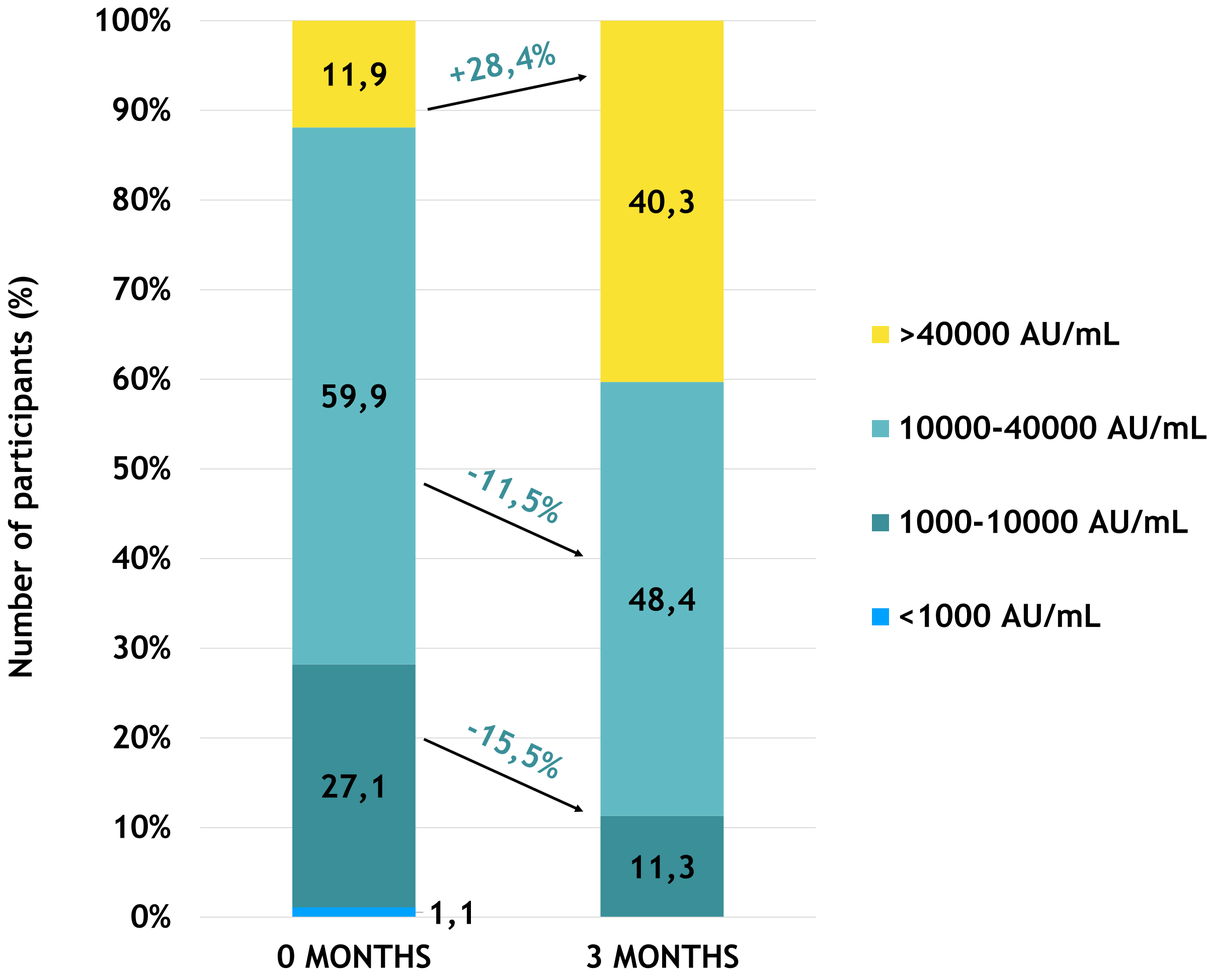


Figure 3. Participants stratified by anti-RBD/S concentration and testing at 0 and 3 months (pre-vaccination).

AT 3 MONTHS

- **40,3% (25/62)** presented anti-RBD/S IgG antibody concentrations **> 40000 AU/mL (+28,4%)**
- **Between 0 Months & 3 Months** ➡ Proportions of participants with anti-RBD/S IgG antibody concentrations **between 1000 - 10000 AU/mL and 10000 - 40000 AU/mL decreased**
- The differences in anti-RBD/S IgG antibody concentrations between the two rounds of testing were significant

RESULTS

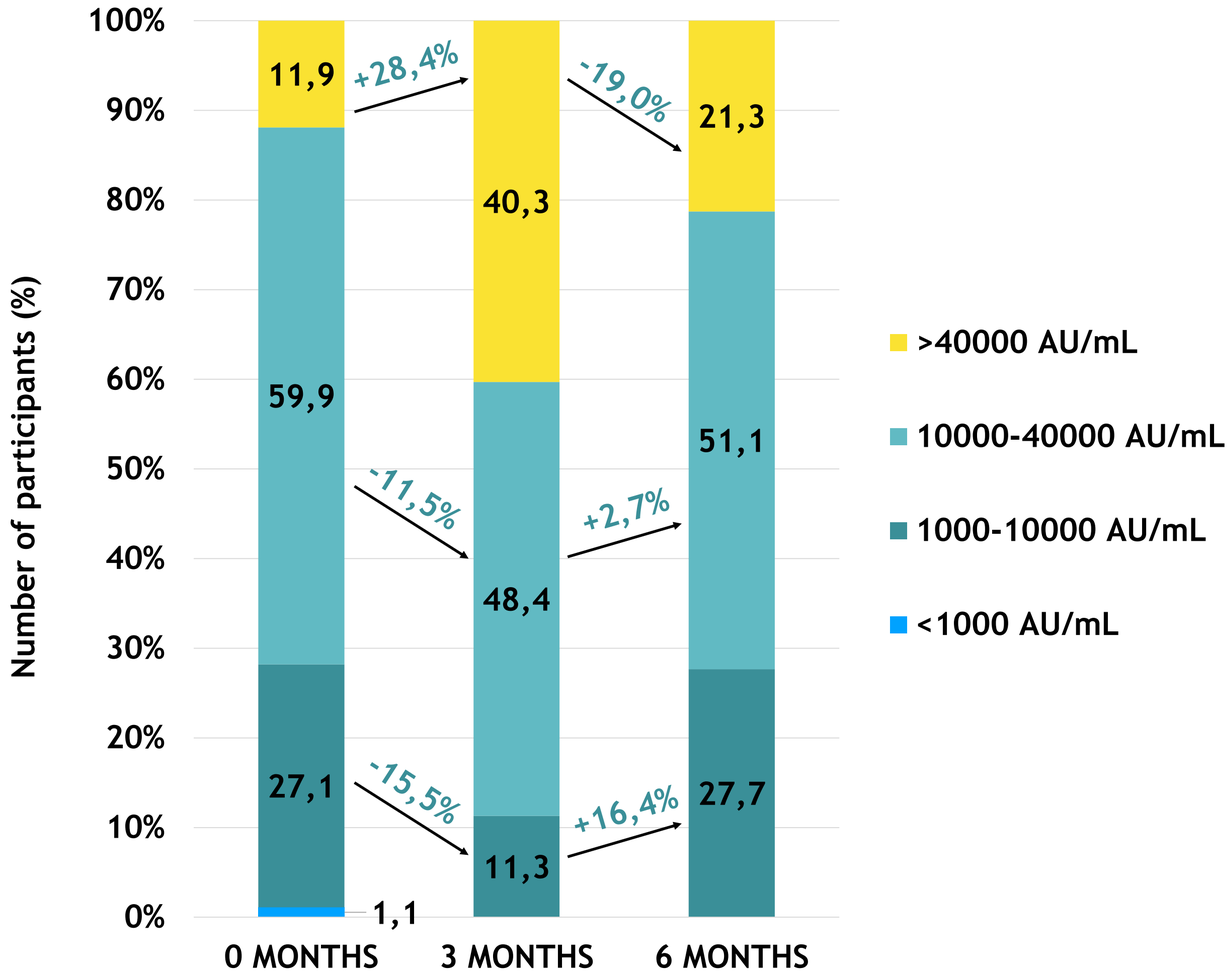


Figure 4. Participants stratified by anti-RBD/S concentration and testing at 0 and 3 months (pre-vaccination).

AT 6 MONTHS

- **21,3% (10/47)** presented anti-RBD/S IgG antibody concentrations **> 40000 AU/mL (-19,0%)**
- **Between 3 Months & 6 Months ➡ Proportions of participants with** anti-RBD/S IgG antibody concentrations between 1000 - 10000 AU/mL & 10000 - 40000 AU/mL **increased**
- The differences in anti-RBD/S IgG antibody concentrations between the two rounds of testing were significant

CONCLUSIONS

- **Three months** post-COVID-19 2023 autumn vaccination, an **increase in the concentration** of anti-RBD/S antibodies was identified among HCW **(+28,4%, >40000 AU/mL)**
- **Six months** post-COVID-19 2023 autumn vaccination, the concentration of anti-RBD/S antibodies decreased (**-19%, >40000 AU/mL)**
- These results are in line with the **expected decay of antibodies** over time after 3 months of vaccination and **reinforce the importance of revaccination in HCWs**
- There **isn't a specific concentration of anti-RBD/S antibodies that definitively guarantees immunity** (infection or vaccination). Immunity to COVID-19 is multifaceted, involving not just antibodies but also T-cell responses, memory cells, and other immune components
- However, certain levels of neutralizing antibodies have been correlated with **reduced risk of symptomatic infection**. Studies suggest that higher concentrations of neutralizing antibodies are associated with **stronger protection against COVID-19, especially against severe disease**

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Thank you for your attention!

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