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Interestingly, the transfusion rate of non-COVID patients who had been admitted during the pandemic was significantly higher than the rates of patients before the pandemic for RBCs (9.7 vs. 6.8 units/patient-day;  $P=0.01$ ), for PLTs (13 vs. 5.9;  $P<0.001$ ), for FFP (8.75 vs. 4.8;  $P=0.01$ ), and for cryo (2.6 vs. 1.7;  $P=0.3$ ). A possible explanation for these findings is given the condition caused by the quarantine and social restrictions, there was an overwhelming fear among patients to visit hospitals. This delay in referral may cause the disease to deteriorate and increase the need for blood transfusion. Furthermore, given the prevailing condition in the hospital, the increase in the number of COVID-19 patients, a reduced hospitalization capacity, and also an impaired operating room availability and efficiency physicians adopt more conservative strategies to sustain life and improve patients' outcomes, including blood transfusion.

In summary, during the first and second waves of the COVID-19 outbreak in Iran, the overall transfusion of blood components decreased. However, from an organizational standpoint, we faced additional challenges as we attempted to address both COVID-19 and concurrent transfusion needs of non-COVID wards. This emphasizes the need for more targeted measures and interventions by precisely following recommended clinical guidelines on blood transfusion.

#### Ethical statement

The study protocol was reviewed and approved by the ethics committee of the Mashhad University of Medical Sciences (IR.MUMS.MED.REC.1399.713).

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#### Contributions

Samaneh Boroumand–Noughabi: project administration, supervision, writing – review & editing; Atefeh Rahmati: investigation, data curation, writing – original draft preparation; Negar Morovatdar: conceptualization, methodology, software, formal analysis; Mohammadreza Keramati: writing – review & editing.

The authors Samaneh Boroumand–Noughabi and Atefeh Rahmati contributed equally to the work.

#### Disclosure of interest

The authors declare that they have no competing interest.

#### Seroprevalence of SARS-CoV-2 among blood donors: A practical serosurveillance tool for COVID-19



Dear Sir,

We read with great interest the publication titled “SARS COV-2-IgG antibodies in blood donors in pandemic - a game changer for policy makers” by Mahapatra [1]. In the study the author has concluded that seroprevalence of SARS-CoV-2 IgG antibodies among blood donors can be used as a surveillance tool to estimate the extent of spread of SARS-CoV-2 among the general population. We would like to share ideas related to this publication. The antibody tests against SARS-CoV-2 can be broadly classified into two types:

- immunochromatography based lateral flow assays;

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- ELISA (enzyme linked immunosorbent assay)/chemiluminescence based assays.

Herein, the aspects related to use of antibody tests among blood donors for serosurveillance of SARS-CoV-2 infection are discussed.

#### 1. Rapid card test vs. ELISA, which test to use for screening as an epidemiological tool for serosurveillance?

A screening test for serosurveillance should have the following features:

- should be easy to conduct;
- should be reasonable in cost;
- should be widely available for mass screening;

- should be reliable and valid [2].

The difference between the difference types of SARS-CoV-2 antibody test methods is enumerated in Table 1. Based on the above characteristics, rapid card based antibody test is ideally suited as a screening test to detect antibodies against SARS-CoV-2 especially, in resource constraint settings.

## 2. Optimal screening test for natural infection vs. vaccination induced antibodies against SARS-CoV-2?

The primary purpose of serosurveillance is to study the percentage of population which has antibodies against an infectious agent and in the present scenario, antibodies against SARS-CoV-2 can be due to:

- natural SARS-CoV-2 infection and;
- vaccination induced

The available antibody tests for SARS-CoV-2 can detect antibodies against nucleocapsid (N) protein, spike (S) protein or receptor binding domain (RBD) protein of the SARS-CoV-2 [3]. Natural infection results in production of antibodies against all three types of proteins. In contrast, type of antibodies induced by vaccination, depends upon the type of vaccine administered. Most of vaccines authorized by World Health Organization and used in USA, Europe and Asia induce antibodies against only the S protein and not against the N protein. An antibody screening test detecting only anti-N and not anti-S will return a non-reactive test in such individuals. Hence, it should be ensured that the antibody test being used for screening must be able to detect antibodies against both S and N protein of SARS-CoV-2.

## 3. Advantages of using blood donors as the study sample in serosurveillance studies?

A large number of individuals infected with SARS-CoV-2 remain asymptomatic [4]. Therefore, an accurate estimation the percentage of population with immunity against SARS-CoV-2 can only be made by serosurveillance study which also identifies the asymptomatic individuals who may not have been tested for the SARS-CoV-2 during their infection [5]. Blood donors are healthy individuals and epidemiologically speaking, it is an accessible population which is a reliable representative of the target population i.e. the general population. Moreover, no additional blood sampling is required to conduct a serosurveillance study involving

**Table 1**  
Comparative assessment of the different types of SARS-CoV-2 antibody tests.

Immunochromatography based lateral flow assays	ELISA/chemiluminescence based assays.
Rapid point of care test	Laboratory based test
Qualitative test	Quantitative test
Result comes in few minutes	Result comes in few hours
Less equipment and reagent	More equipment and reagent
Staff can be easily trained	Requires extensive training of staff
Less cost	More cost

blood donors as the blood samples taken for transfusion transmitted infection testing can be used for the antibody screening test for SARS-CoV-2.

To conclude, estimation of seroprevalence of SARS-CoV-2 IgG antibodies among blood donors using rapid card based technique, is an easy and cost-effective tool for serosurveillance of SARS-CoV-2.

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## Disclosure of interest

The authors declare that they have no competing interest.

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