Overview of PNAEQ clinical participants during COVID-19 pandemic

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Introduction and Aim

External Quality Assessment Schemes are a crucial tool to identify and evaluate laboratory performance. COVID-19 pandemic poses a challenge for laboratories, since they own a critical role in the diagnosis, prognosis and therapeutic monitoring. The laboratory practice in stressful conditions may increase errors due to several factors.

The main objective of this study was to evaluate and compare the performance of clinical participants in Portuguese External Quality Assessment Programme (PNAEQ) during the pandemic period (**2020**) and previous schemes (**2019 or 2018**), for different parameters of **Haematology**, **Chemistry**, **Endocrinology**, **Immunology** and **Microbiology**.

Methods

PNAEQ sent an on line questionnaire to participants, collecting their information regarding changes associated with the COVID-19 pandemic, and a descriptive analysis of the results was made. The **CV%**, **participation rate**, and **unsatisfactory results** were studied, comparing two periods (2020 and previous schemes). To compare the CV%, we selected samples from the same time of the year, with similar concentration levels (maximum two concentrations), and applied the Forkman method[1]. Also, the participation rate and unsatisfactory results between periods (all samples from 2019 vs 2020), was compared by a Chi-squared test. A significance of 5% was considered. In Table1 is exposed the methodology and the results of the parameters studied.

	Area	Parameters	pValue (comparison 2018/2019-2020) CV% Level A	CV% Level B	Participation rate	Unsatisfatory results (UR)	Significance difference between 2018/2019 and 2020
Quantitative parameters	Immunology	CPR	0.527		0.974	0.384	No significant difference
	Endocrinology	FT3	0.699		0.745	0.234	No significant difference
	Clinical Chemistry	Creatinine	**0.005**	**0.046**	0.513	0.889	**Creatinine: Significant difference for CV%**
		AST	0.065	0.108	0.547	0.682	No significant difference
	Hematology	Hemoglobin	0.068	0.852	0.890	0.293	No significant difference
		Leukocytes	0.321	0.365	0.752	0.808	No significant difference
		APTTsec	**<0.001**	0.956	0.400	0.433	**APTTsec: Significant difference for CV%**
		PT INR	**0.036**	0.723	0.400	**0.023**	**PT INR: Significant difference for CV% and UR**
		HbA1c	0.120	0.425	0.912	0.369	No significant difference
Qualitative parameters	Rubella	IgM	NA		0.753	0.406	No significant difference
		IgG	NA		0.833	0.406	No significant difference
	Syphilis	Syphilis	NA		0.483	**0.010**	**Syphilis: Significant difference for UR**
	Parasitic Morphology	*Cystoisospora*	NA		0.589	0.068	No significant difference
		Plasmodium falciparum	NA		0.350	0.303	No significant difference
	Blood Morphology	Therapy-related acute myeloid leukaemia	NA		0.856	0.418	No significant difference
		Spherocytosis	NA		0.856	0.521	No significant difference

Table 1: Methodology and results of the comparison of CV%, participation rate, and unsatisfactory results, between 2018/19 and 2020 *NA – Not Applicable*

[1] MedCalc Software Ltd. Comparison of Coefficients of Variation calculator. https://www.medcalc.org/calc/comparison_of_coefficientsofvariation.php (Version 20.015; accessed November 15, 2021)

Results

The analysis of the participant's questionnaire (N=70) showed that **87%** implemented SARS detection methods (RT-PCR, Ab, Ag), the majority reported a **decrease** in the requests of the selected parameters (Crea, AST, Blood Count, PT, APTT, FT3, CPR), **36%** referred increased absenteeism and **83%** had faced staff shortage due to shifting to other departments.
For quantitative parameters, CV% comparisons indicated significant differences between the periods in **creatinine**, **APTTsec** and **PT-INR.** Our results showed that participation rate in these schemes was **maintained.** The proportion of unsatisfactory results demonstrated no significant differences between both periods, except for **PT-INR** (Table1).
Most of qualitative results showed no significant differences between the periods, except the proportion of unsatisfactory answers for **syphilis** (Table 1).

Conclusion

In general, laboratory performance during the pandemic period was maintained, in spite of the changes faced in the usual laboratorial routine process. PNAEQ's deadline flexibility might have been helpful in achieving these results. Further investigation should be considered to identify the causes of the observed differences found in syphilis, APTT, PT and creatinine.