

COVID'S IMPACT IN EDUCATION

Who was penalized by changes introduced after the exogenous shock?

Introduction

Changes introduced in 2020, for the first exam season after COVID:

- Students were denied the possibility of taking exams to improve the previous year's results, except for the exams needed to apply to University;
- Many students would have missed some contents, exams had a significant number of optional questions. Students could answer them all; the examiners were required to correct all and after choose the most favorable combination

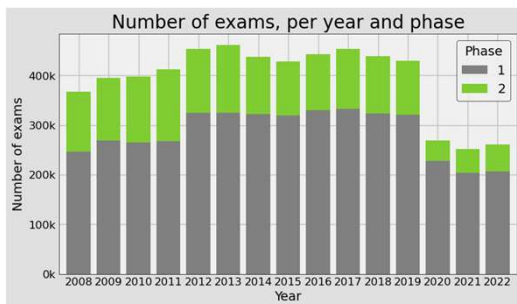
Data sources and methodology

Data gathered from Nacional Exam Jury (Juri Nacional de Exames), at Ministério da Educação e Ciência's website at:
<https://www.dge.mec.pt/relatoriosestatisticas-0>

A Python project was created to import and merge all individual files. A notebook was added to support the analysis and presentation of Information.

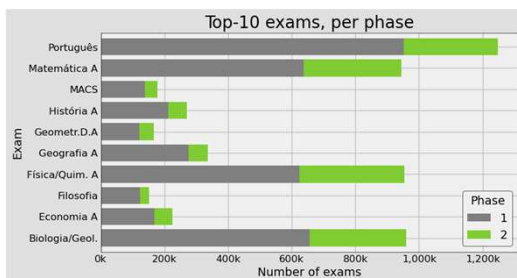
We will concentrate mostly on Phase 1 exams. Taking a Phase 2 exam already means that the student failed in Phase 1 or wants to improve grade.

Info: Number of exams



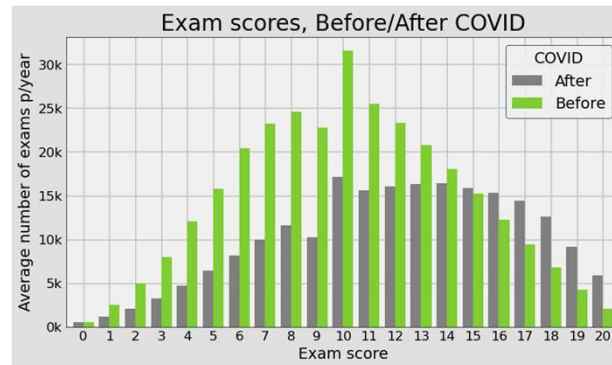
There's an apparent trend of small but consistent growth in the number of exams; this trend ended in 2020, with an abrupt drop. Drop in Phase 2 exams is proportionally the even more pronounced.

Info: Top-10 exams



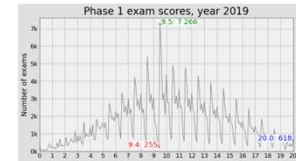
Português is the most common exam in Phase 1, followed by Física e Química A, Biologia e Geologia e Matemática A. On Fase 2, the four are on par.

Results, Before vs After Covid

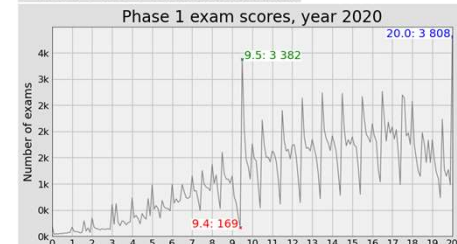


The results (rounded to integer) resemble a normal distribution, symmetric and centered at 10, with extreme values being rare. Also noteworthy how Score=9 is below expected.

The COVID miracle



In 2019 the distribution of results for Phase 1 was as expected; centered in 9.5, some symmetry, 20.0 is uncommon. Mean result was 10.4, median was 10.3. Both values the highest in 10 years.



In 2020, Phase 1, score 20.0 was the most common result. Number of exams decreased by 29%, but the proportion of 20.0 increased 8.7 times.

In 2020 the distribution is no longer symmetrical; it's leaning to higher values. Mean score increased to 13.1 (+2.7), median increased to 13.6 (+3.3).

Which students were penalized?

- Students repeating exams in order to improve grades were denied that; They were prevented from taking exams and forced to compete with these highly-inflated results;
- Students that would normally stand out with extremely high exam grades; As these grades became commonplace, they no longer benefited from being extremely high achievers;

The road ahead for education

- Impact of exams to access higher education is diminishing over the years;
- Since 2020, ENES DBs has no internal grades, which are relevant to analyse;

Further research (WIP)

- Compare internal grades with exam results;
- Further data (census, university enrolment, etc), to extend this analysis;
- Microdata on social context, evolution from 9th to 12th grade exams would open new analysis vectors;

References

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Created for JOULE session, 2023-11-10

This work is dedicated to my daughter **Carolina** and my son **Ricardo**; they led me to this topic. I thank Professor **Bruno Damásio** at NOVA IMS for the enthusiasm he showed on this topic and for his valuable help, and my dear colleague **Inês Rocha** for helping in discussing and structuring this poster.

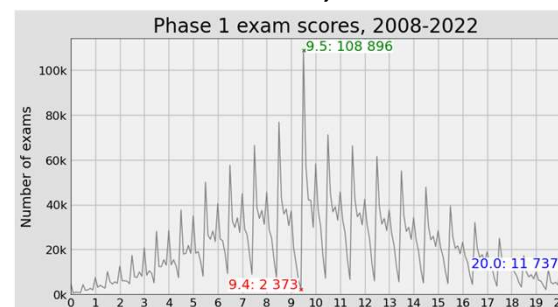
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Project: <https://github.com/samueldatasci/ENES>

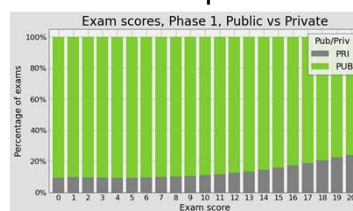
Work in progress; comments are most welcome!

Exam results, 2008-2022



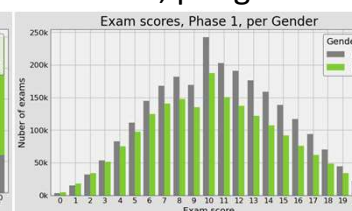
With actual results, the normal distribution merges with an ECG! Examiners avoid scores ending with .4, and round them to .5; this effect is extreme between 9.4 (very rare grade, the highest that means FAIL) and 9.5 (always the mode, and first that means PASS). 20.0 is an uncommon result, especially before COVID exams.

Public vs private



Private schools are consistently more represented as we look at higher grades.

Results, per gender



Boys are less represented in the intermediate grades, and more in both extremes, positive and negative.