



# **Explore the Impact of COVID-19 on HKDSE Performance**

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# Data Science Questions to answer

1. How did school suspensions and online learning during COVID-19 affect student performance in the HKDSE between 2020 and 2022?
2. Verify if the prevailing factors mentioned online that make the differences in performance between students from different schools or backgrounds during the pandemic are true?





# Why the Questions are Important?



As a 2022 DSE graduate, I experienced the disruptions firsthand and observed the challenges many students faced in adapting to remote learning brought by COVID-19.

01.

HKDSE is a high-stakes exam that directly influences students' university admissions and career paths.

02.

Understanding the effects of the pandemic can help educators and policymakers better prepare for future disruptions and address learning gaps that may have widened.



# Difficulties in Answering the Questions

## 1. Confounders:

- Curriculum adjustments by the Education Bureau. E.g. Oral Exam, SBA
- Parents might not be able to work from home/ lack the requisite knowledge to supervise their children's e-learning → hinder the equal access to education by students from different backgrounds
- Students being infected may be affected more adversely. E.g. quarantine, weak body condition

## 2. Limited resources online:

Many surveys are done on primary school students and junior secondary school students, but few on high school students.





# Data Available for Answering the Questions

From **DATA.GOV.HK**:

1. 2018-2023 HKDSE General Performance and By-Subject Performance

2. 2018-2023 PC Usage and Internet Access by Household

- <https://data.gov.hk/en-datasets?page=1>

# Existing Works that Tried to Answer or Answered the Questions

Some previous research and media reports have touched on this topic, stating that online teaching really affects students' performance and limited access to online learning tools (e.g. device, internet access) is one of the most significant factors, but a comprehensive data science-based approach is still rare.






# Methods Used

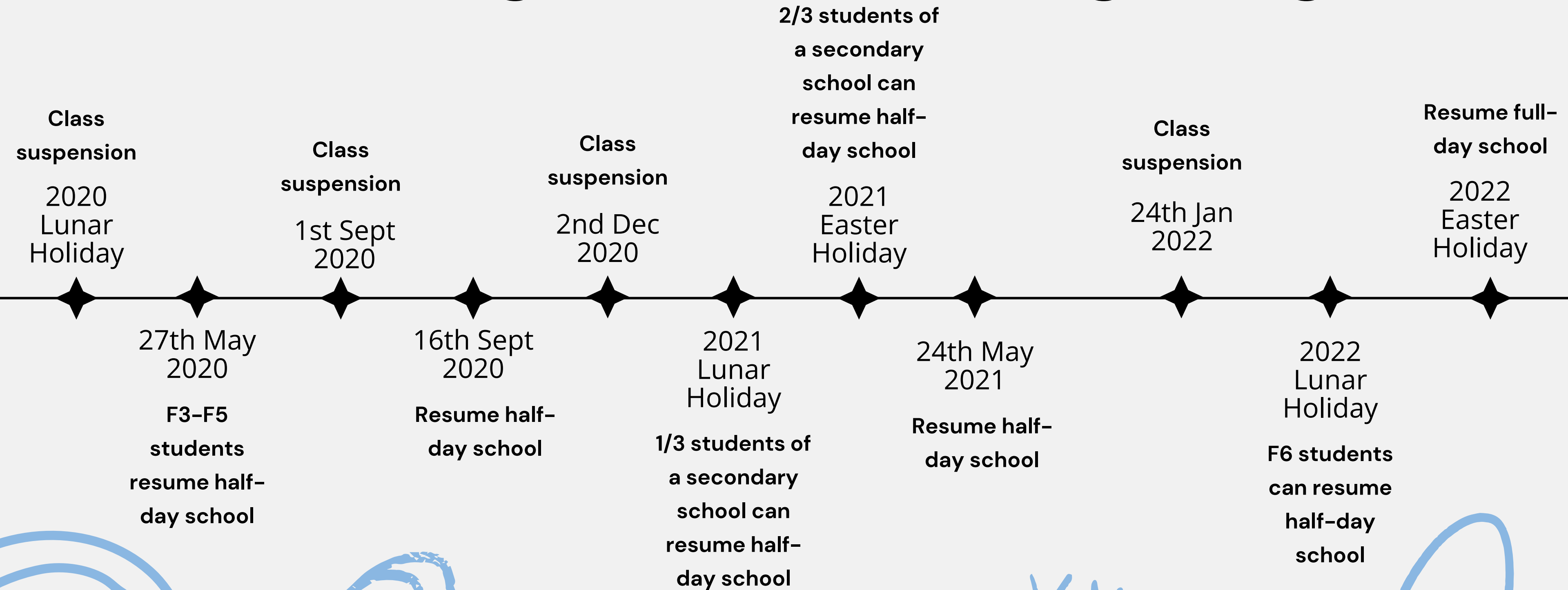
01. Platform:  
R Studio

02. Library:  
readr, dplyr,  
tidyr, ggplot2





# School Suspension and Online Learning Periods in Hong Kong





# A Research Done by CUHK Shows Low Effectiveness of Online Learning

Is online learning valuable?

average score: 2.97 / 5

Understanding?

Only 23% of students could understand the subject content solely by watching videos

What kind of online learning method they like?

- > 70%: real-time online lessons
- 20%: pre-recorded teaching videos

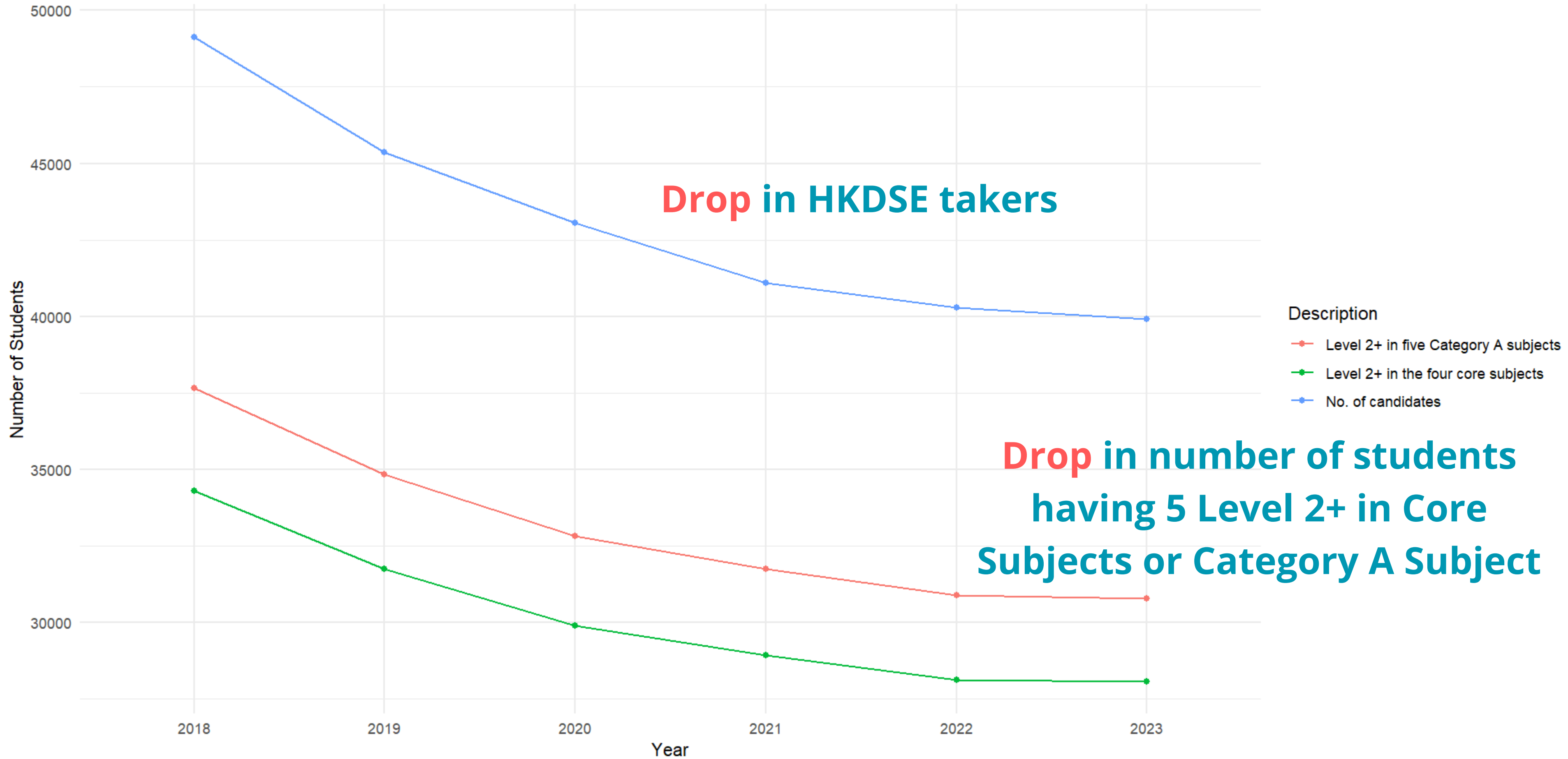
Conclusion by Professor Thomas Chiu

- Teachers actively provided online teaching to students
- **BUT** students' feedback was not as good as expected



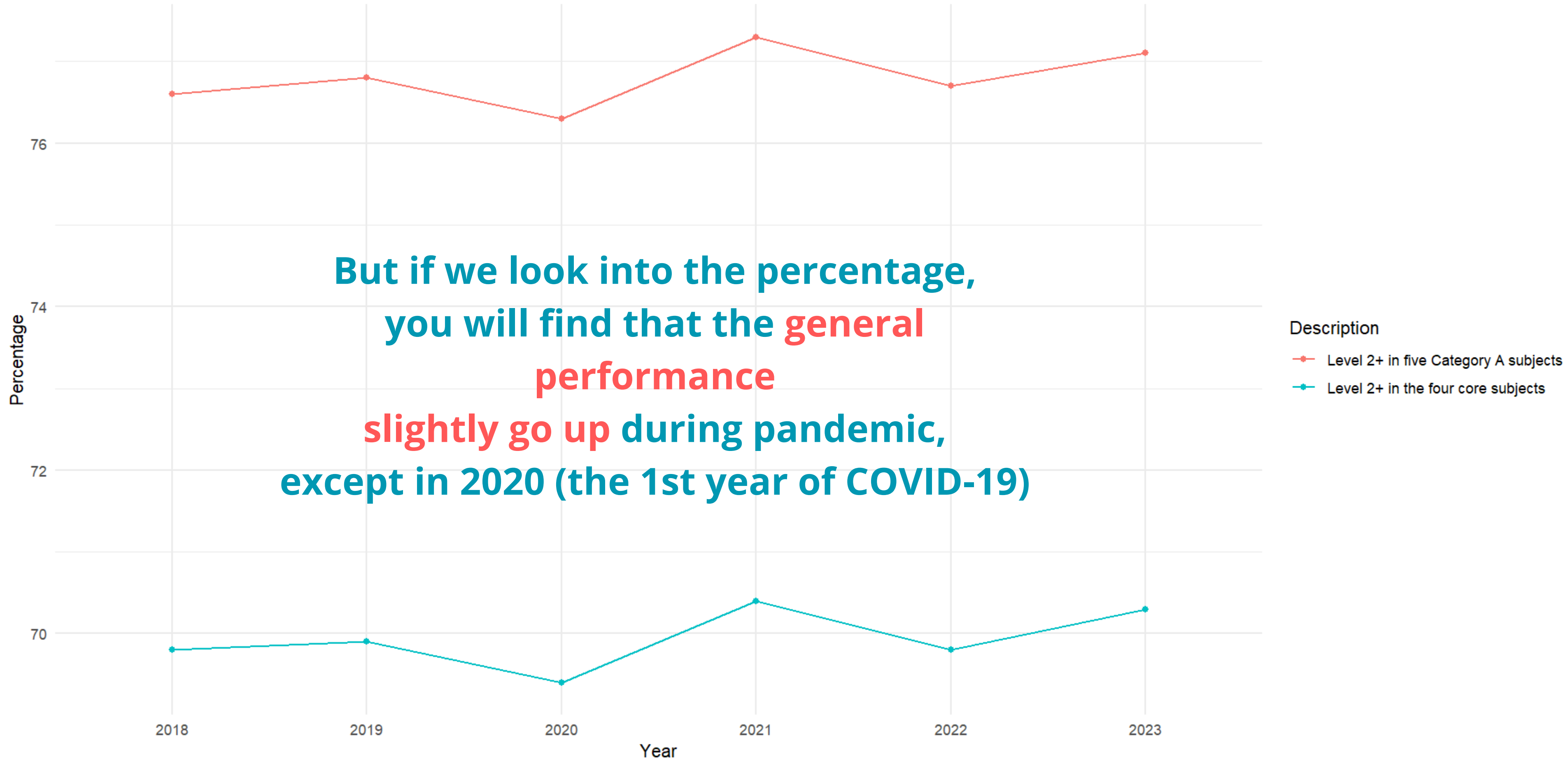
# Findings corresponding to Question 1

Number of HKDSE Day School Candidates and their Performance from 2018 to 2023



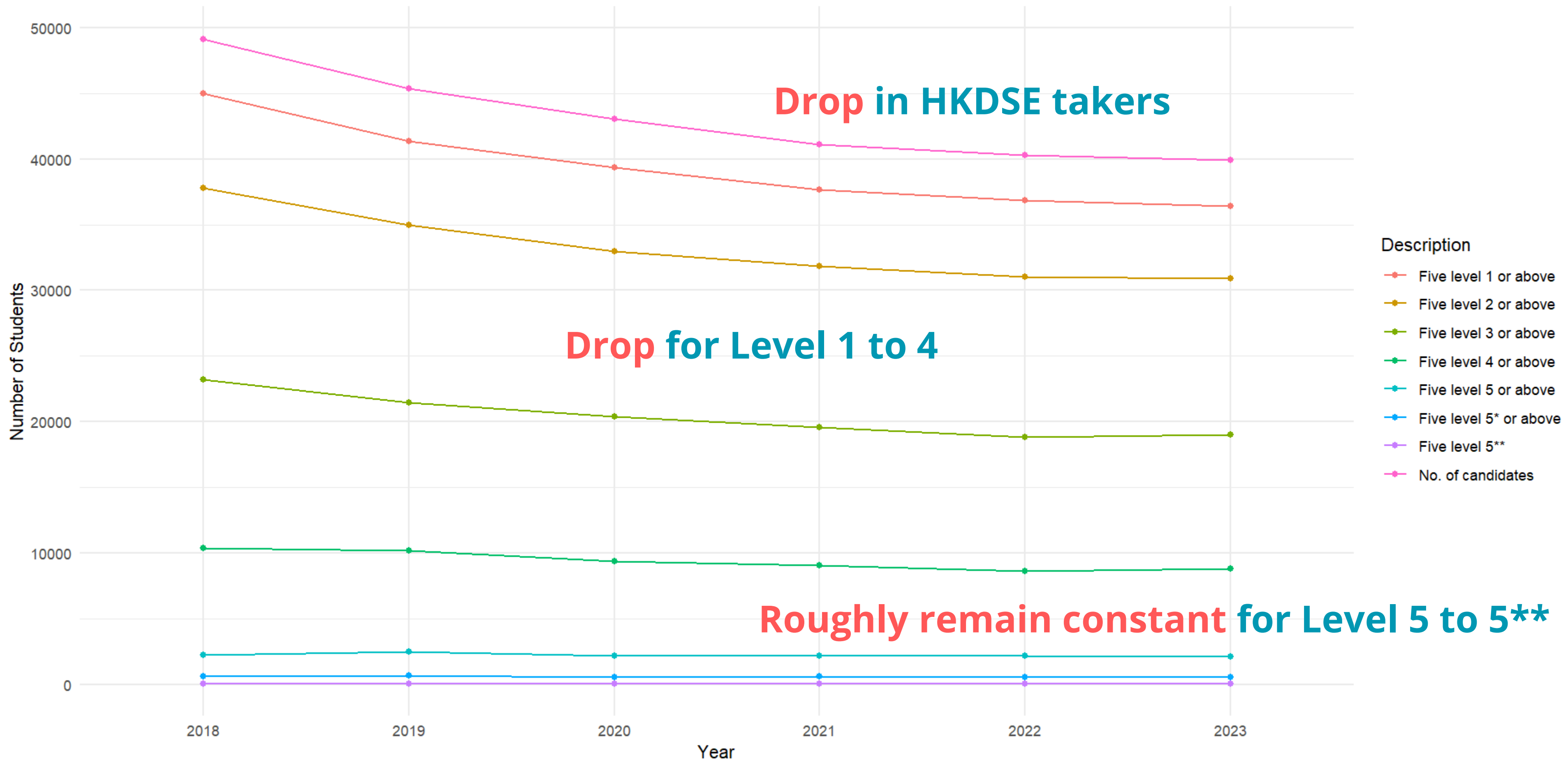
# Findings corresponding to Question 1 (Con't)

HKDSE General Performance Percentage from 2018-2023



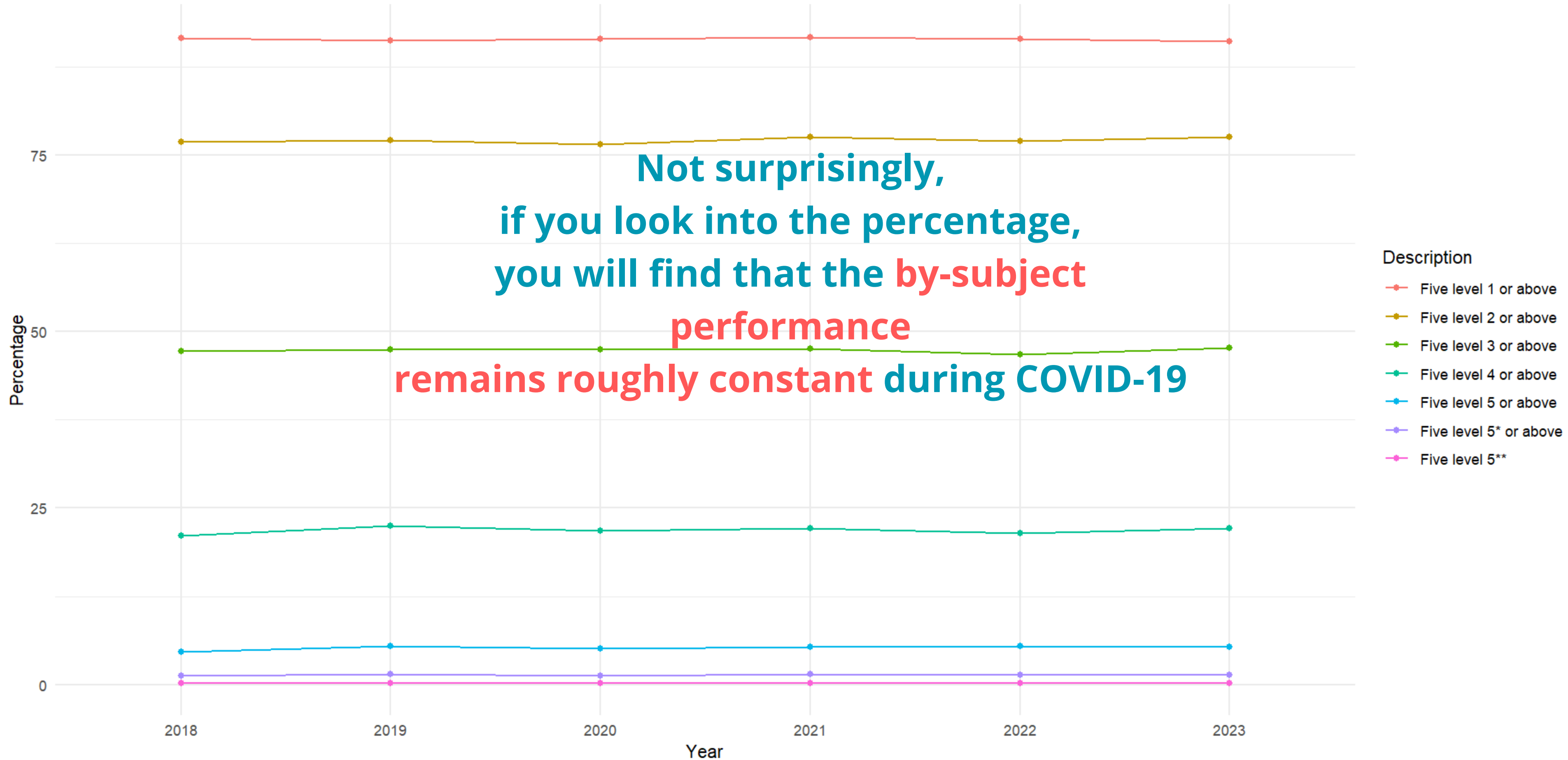
# Findings corresponding to Question 1 (Con't)

Number of HKDSE Day School Candidates and their By-Subject Performance from 2018 to 2023



# Findings corresponding to Question 1 (Con't)

HKDSE By-Subject Performance Percentage from 2018-2023





# So, We maybe wrong!

HKDSE performance has a **weak correlation** with class suspension caused by COVID-19.

Online teaching **does not really affect** students' public exam performance heavily.

# Prevailing factors found online



From previous CUHK Research:

- **18.6%** of the respondents had to **borrow** digital equipment



- 94% of households had access to the Internet in 2019
- Only **71% of low-income** family (<\$10k) had **Internet access**



- Community Care Fund has implemented an assistance programme since 2018
- Yet, as of 2020, **only 32% of schools** have joined the programme

## Online learning tools

Device, Internet Access

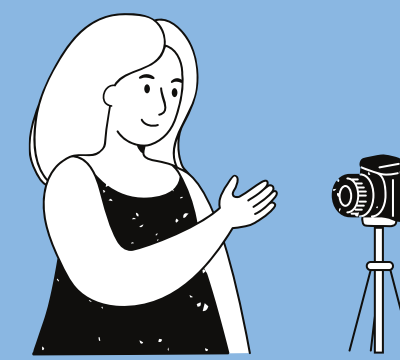


My home:

- No Wi-Fi before
- Unable to install fibre connection
- **Unstable and slower connection**



- Government subsidies for low-income families since 2010
- Still, ~ **10% of secondary school students** did not have **PC** in 2018–2019

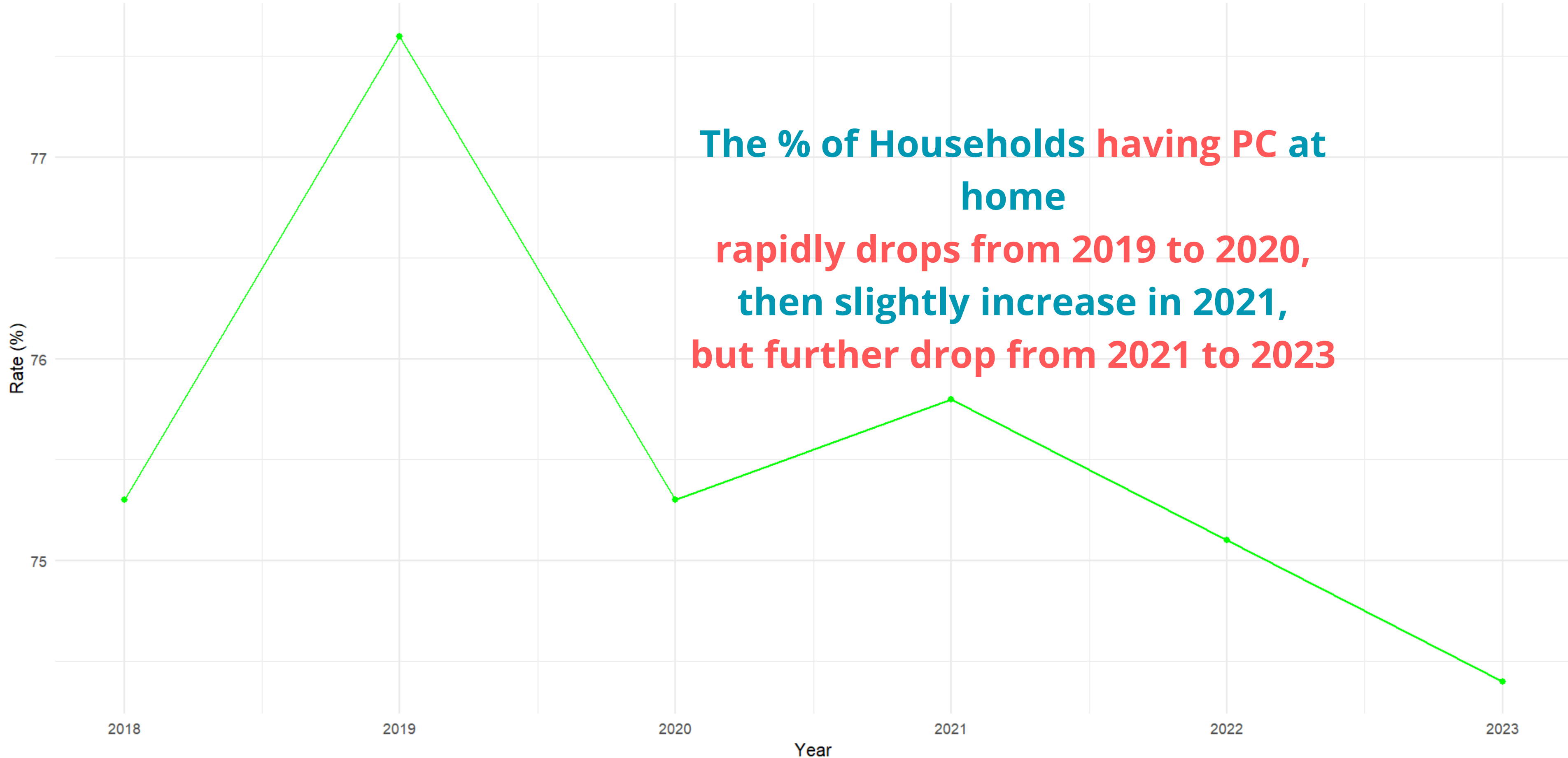


- Flat-rate subsidy for low-income families children easier Internet Access
- **Inadequate** amount
- **Limited by living location**



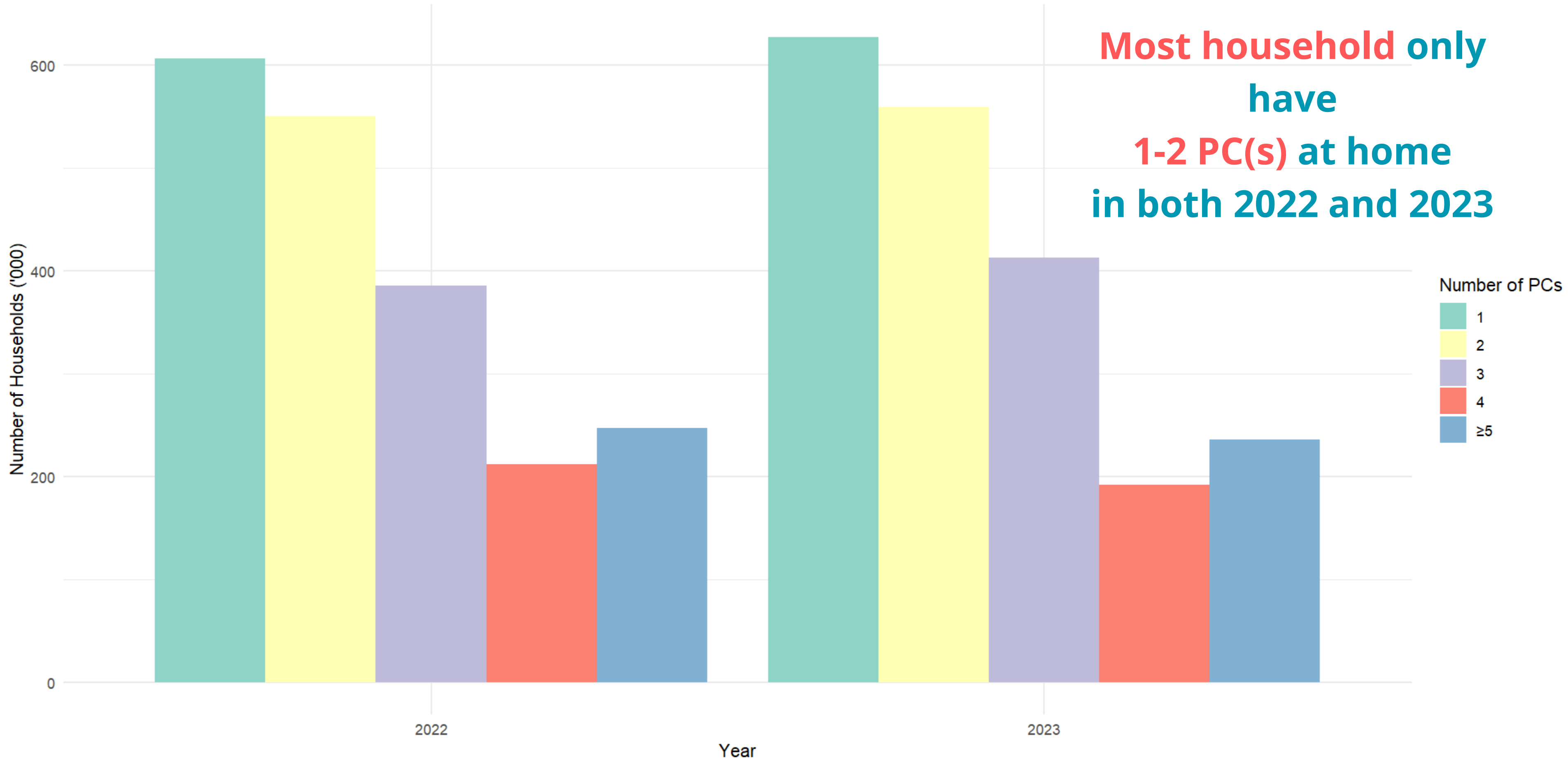
# Findings corresponding to Question 2

Change in Rate (%) of Household Who Had PC at Home (2018-2023)



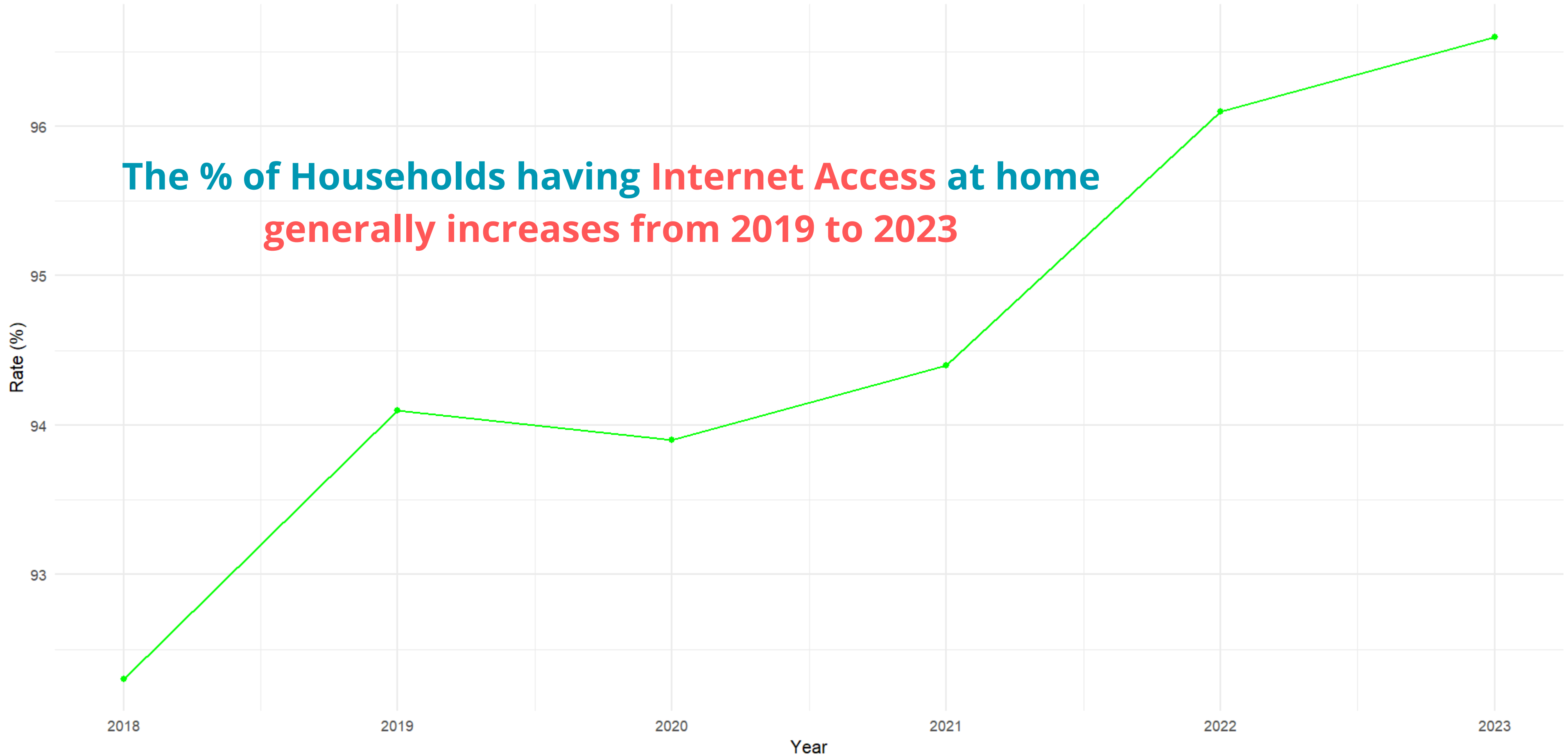
# Findings corresponding to Question 2 (Con't)

Number of PCs by Household Who Had PC at Home (2022-2023)



# Findings corresponding to Question 2 (Con't)

Change in Rate (%) of Household with Internet Access at Home (2018-2023)



# Key Solutions

## 1. Support or aid students to purchase digital equipment

- For example, the Singapore government equipped every secondary one student with a PC by 2021 and gave out a second computer to families having > 2 school-age children.

## 2. Providing a wide safety net of digital access

- Singapore NEU PC Plus Programme: provide subsidy according to their household income level → nearly 100% of household with schoolchildren had access to the Internet in 2019.







01.

There is a weak positive correlation between class suspension and public exam performance.

## Conclusion

02.

Lack of devices may really be a dominating factor but Internet Access has a non-significant correlation with HKDSE performance.



# Future Works

1. Explore the reasons behind why people think that COVID-19 has affected students' HKDSE performance even if the data shows that the general performance during that time remains steady compared to previous years.
2. Were there differences in performance between students from different schools or backgrounds during the pandemic? Do the research.
3. Some students may seize the opportunity during COVID-19 to advance themselves, but at the same time some students are disadvantaged in e-learning, which may result in a larger gap between their performances. This maybe the reason why the data still shows a constant general performance during the pandemic, but need validation



## Acknowledgements and References

Education Bureau:

<https://www.edb.gov.hk/tc/sch-admin/admin/about-sch/diseases-prevention/COVID-19.html>

DATA.GOV.HK:

[https://data.gov.hk/en-](https://data.gov.hk/en-datasets/category/education?page=1&sortBy=relevance&keyword=HKDSE&provider=hkeaa)

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Legco:

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CUHK Press:

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Thank you!

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