**Planned corona studies with register data at CEMO**(Sigrid Blömeke, Rolf Vegar Olsen, Tim Fütterer, & Tony Tan; draft 31 March 2022)

**Research status and research questions**

Analyses of pupil performance based on national tests in reading,re-education and English show no major changes on average between 2019 and 2021 or across different genders, immigration backgrounds or parents' educational attainment (<https://www.udir.no/tall-og-forskning/statistikk/statistikk-grunnskole/analyser/analyse-av-nasjonale-prover-for-8.-og-9.-trinn-2021/>). However, the exemption has sharply increased by between 30 and 40% over the past five years. The correlation between these results is unthinged to control for this is therefore an open question.

In addition,during the pandemic, skola ne has been closed to very different degrees (Directorate of Education, 2022), infection control measures and quarantine weather have affected the school quarter day differently (Bufdir, 2021), andpupils may have roofed such pandemic-related restrictions differently depending on gender and familybackground (Eriksen, 2021), living conditions home (cramped dwelling; Kjøllesdal et al., 2022) or performance level before the pandemic (Andersen et al., 2021; Caspersen et al., 2021). The most vulnerable pupilswho have also received fewer than tenmare for special education or special Norwegian education(Norwegian Directorate for Education, 2021). The Parr group assumes that high school attendance in some pupils, a decrease in motivation, the feeling of lack of a lack of belonging in the learning community and a reduced scope of special education and special language training can lead to learning losses in the long term, possibly in particular in the middle stage (The Working Group for the School After Corona, 2021).

In line with international results both after the first year of periods of school closures (Hammerstein, 2021) and more clearly after two years (Moscoviz &Evans, 2022) and in line with Norwegian research on the health of students in higher education (Sivertsen et al., 2022) and children's health in general (Nøkleby et al., 2021) are therefore our three basic hypotheses:

1. Pandemic-related restrictions have imposed pupils ' learning performance in different ways.
2. Pandemic-related restrictions have increased social inequality.
3. Pandemic-related restrictions will have long-term effects for several years to come.

**Method: Data, variables and analyses**

We will use CEMO's dataset based on data from the whole population in Norway released by Statistics Norway in March 2022 to test these three hypotheses. The dataset includes:

* GSI (Primary School Information System) data for Norway at school level from 1992 through 2021 including information on corona-related restrictions and measures in 2020 and 2021 for all primary schools;
* Fleire registers from Statistics Norway (Statistics Norway) with data at the individual level for all persons who have lived in Norway: registers of education and diplomas sidan 1970 respectively 2000 including national tests sidan 2007, population registers including information on household conditions and familyrelations sidan 1975 respective 2005, employment registers sidan 2000, wealth and import register sidan 1993, housing register sidan 1990 and cash support register sidan 1999;
* UNIT (Directorate for ICT and Joint Services in Higher Education and Research) data on higher education at the individual level sidan 2002 including course selection, credits and grades.

All GSI, UNIT and SSB data are coordinated through keys at the individual, school, employer, basic and county level. The population size is 8.9 million individuals.

We will focus on the potential development of social inequality in learning performance in dependence on corona-related restrictions with regard to these categories:

* gender
* living conditions and
* socio-increaseonomic background (defined as immigrant background, parents' level of education and household income)

Additional analyses are feasible for groups of pupils who may be considered particularly vulnerable:

* pupils who performed allereie low before the pandemic
* pupils with high weather in the follow-up diploma
* pupils characterised by a combination of the background eigenskapane list above that entitle a risk of low performance (e.g. not Norwegian-born boys)

If time allows for it, additional groups of particularly vulnerable students, such as pupils in families with pandemic-related unemployment, pupils living with one parent or pupils, can also be investigated for behavioural-related challenges in order and behaviour.

At the school level, we can investigate whether social inequality between schools has increased if they have a particularly high proportion of pupils entitled to special education or special language training.

All analyses are performed as clay level analyses (level 1: pupil; level 2/3: school and/or basic district and/or county depending on the research question) to take into account potentially different practices by setting grades or different compositions of the pupils (compositionalcharacteristics) across schools, the basic district or county.

All models will include control variables that can affect the results in an unønska way.

**Arbeidspakker**

***AP 1: Learning progression in dependent on corona-related restrictions during the pandemic***

AP 1.1: Learning progression **from 8th to 9th grades in reading andre-entry during the pandemic samanlikna with before and after the pandemic (measured as performance on national tests, same test is used on the 8th and 9th stage in the same year, over years the samples lenka saman using anchors)**

* Is the progress from 8th to 9th stage different for different cohorts on average seen at the national level (2017 – 2018, 2018 – 2019, 2019 – 2020 = first corona litter, 2020 – 2021 = second corona cohort, 2021 – 2022 = third corona litter, 2022 – 2023, 2023 – 2024) after checking for increased exemption (between 30 and 40% both in reading and recitalbetween 2016 and 2021)?
* Is there different progress from 8th to 9th grades in reading and reading for different studentgroups (different gender, immigrant background, parents' level of education, household income, living conditions, pupils' absence, grade in order and behaviour) controlled for county and basic district and other school property (composition)?
* If there are different progress from 8th to 9th grades in reading and math for different schools (closure in follow-up GSI, infection control measures in follow GSI, the burden of sickness on the part of læraranes and pupils in follow GSI, reduced special education in follow-up GSI, specially reduced language training in follow-up GSI) controlled for county and basic district (or centrality) and other compositional characteristic (in particular, immigration background, household income and parents' level of education in line with the school contribution indicator model; Arnesen, Ekren, & Perlic, 2022)?

**AP**  1.2: **Learning progression from 5th** **to 8th** **grades in reading,rectification and English (measured as performance on national tests, various samples, through difference-in-difference analyses, and development over time)**

Pupils from one level of mastery at the 5th stage, both in reading, maths and English, are spread over several levels at the 8th grade (SSB, 2020). Are there systematic differences in the respective pupils by sex, different immigration backgrounds, parents' level of education, household income or the pupils' absence that may indicate different learning performance of these groups?

And has the potential systematics occurred during the pandemic depending on school-related characteristics such as lockdown? (Comparison of cohorts' development through difference-in-difference analyses 2016 – 2019 = not affected by corona, 2017 – 2020, 2018 – 2021, 2019 – 2022 = strongest affected by the corona restrictions, 2020 – 2023, 2021 – 2024)

**AP 1.3: Differences between national tests and standpoint grades as outcome targets**

Does the picture about learning performance and potential differences change when using a standpoint in Norwegian main objectives, English written and mathematics instead of performance in tests? For example, is a potential gap smaller that could be interpreted as a result of teachers trying to pay attention to particularly vulnerable children? And which corona-related student or school characteristics can explain potential differences between performance on national tests and standpoint grades? (controlled for non-corona-related characteristics such as gender, parents' level of education, household income, county/basic circuit, etc.)

***AP 2: Long-term effects (measured in exam results) of corona-related restrictions after the pandemic***

In the spring of 2020 to 2022, the exam was cancelled, but it is planned to start again with the exam from 2023, which can then be used as a long-term outcome measure to investigate whether the pandemic has led to increased inequalities between the two years based on the written exam grades students receive in lower secondary school. During the project period, we will investigate:

* National tests on the 8th stage in 2021 – exam on the 10th stage in 2023
* National tests on the 8th stage in 2022 – exam on the 10th stage in 2024
* National tests on the 8th stage in 2023 – exam on the 10th stage in 2025

We plan to match national tests in reading with the exam in the main Norwegian scripture doctor, national tests inre-sit with the exam in mathematics writing doctor and national tests in English with exam in English writing doctor. From our analyses, we know that these averages are highly correlated.

***AP 3: What can we learn from the pandemic and this project on knowledge needs in the future?***

There are a number of questions we cannot answer – and especially not at short notice. The project will give us knowledge about data needs in the future when we may have to deal with new pandemics. Allereie no we can confirm that long processing time at Statistics Norway makes it difficult to access register data in real time. This means, for example, that we cannot include exams and national tests from 2025. In addition, there is a lack of information we would like to have had. And then it has been shown that it is difficult to link different data sources to quarrants in order to be able to answer important questions holistically. The project will provide us with careful information about future needs.

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