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## Evidence from research on childhood environment, schooling, educational choice and labour market entry

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# Swedish children and youth during the COVID-19 pandemic[a]

Evidence from research on childhood environment, schooling, educational choice and labour market entry

by

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## Abstract

Based on previous research, available statistics and current information on the COVID-19 pandemic, this report analyses and discusses possible consequences of the ongoing pandemic for Swedish children and youth, in the short and longer term. The pandemic is discussed in five chapters focusing on (1) the impact on childhood environment and human capital development, (2) the consequences for children's development and school performance due to increased absenteeism among children, students and teachers in preschools and schools, (3) the effects of distance education, (4) the impact on the demand for education, and (5) consequences for labour market entry and long run labour market outcomes. It

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is too early to draw firm conclusions about the long-term consequences of the coronavirus pandemic, and yet our overall conclusion is that the pandemic has negative consequences for many children and young adults. Children and youth from disadvantaged environments, with a weak socio-economic background and an inadequate social safety net, are more likely to be severely affected. There are therefore reasons to safeguard and develop the institutions, such as prenatal and child healthcare, social services and school health programs that provide services for children and youth. Moreover, the education system has an important task in compensating for shortcomings in human capital development and lost opportunities caused by the pandemic.

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# 1 The impact of the COVID-19 pandemic on children and youth

**Anna Sjögren**

Since March 2020, the COVID-19 pandemic has affected children, youth and their families in many ways, in Sweden and elsewhere. Illness, anxiety about contracting the virus and infecting others, limited social contacts and the requirement to stay at home at the slightest symptom of virus infection have changed the lives of many families. The labour market consequences of reduced mobility and economic activity due to high prevalence of infection and prevailing recommendations have also meant that many parents, like other workers, have lost their jobs, been notified of redundancy, furloughed or put on short-time work schemes, or required to work from home.

For many families and children, this means increased stress, but also an increased risk of conflict and perhaps separation. Furthermore, the social safety net provided by friends and relatives that often surrounds children has not been as accessible due to social distancing. At the same time, children's pre-school and school environment has been affected by absenteeism due to illness among both teachers and children. In the spring, upper-secondary schools and universities switched to distance education. In addition, national tests and national university aptitude tests were cancelled. During the autumn of 2020, on-site teaching was interspersed with distance education, and it was announced that the national tests will be cancelled also in the spring term of 2021.

Many adolescents and students have lost their part-time jobs and have had their student exchange programmes, studies and travels cancelled or postponed. The prospects of travelling and working before moving on to higher education have been blighted for many young people, and more of them than ever are applying to university, with increased admission competition as a result. Furthermore, for those leaving the education system and entering the labour market, it has become more difficult to find a job.

The purpose of this report is to analyse and discuss the consequences of the ongoing COVID-19 pandemic for children and youth in the short, but also in the longer term, based on previous research, available statistics and current information on the pandemic. Chapter 2, written by Hanna Mühlrad and Anna Sjögren, discusses the impact of the pandemic on the environment in which

children grow up and the possible consequences for children's human capital development.[1] It discusses the extent and possible effects of confirmed infection and illness among children and parents, the incidence of infection and anxiety among pregnant women, the home environment, and parents' unemployment and financial distress. Chapter 3, written by Björn Öckert, estimates the impact of the pandemic on children's, students' and teachers' absenteeism in preschool and compulsory school. Based on studies of the effects of school attendance and absenteeism, and class size effects, an assessment of how increased absenteeism during the pandemic can be expected to affect children's learning and future income is presented. Chapter 4, written by Caroline Hall and Martin Lundin, discusses the consequences of distance learning in upper-secondary schools, universities and vocational training, based on previous research on effects of ICT use in schools and online education affect performance. Chapter 5, written by Helena Holmlund, focuses on how the demand for education and educational choices are affected during times of economic crisis. Current data on the number of applicants to higher education are discussed in the light of economic theory and previous empirical evidence. The sixth chapter, written by Mattias Engdahl, discusses the consequences of economic downturns and crises for young labour market entrants, and presents research-based explanations for observed negative long run consequences of entering the labour market during an economic crisis. The chapter also discusses what we can expect of the current crisis. In the final chapter, Anna Sjögren summarizes the main findings and conclusions that follow from the previous chapters.

The contributing authors have had full freedom to choose focus based on a given theme. As the research in many areas is extensive, our aim has not been to make a comprehensive review of the literature concerning everything that may relate to children and youth during the COVID-19 pandemic. Instead, we have chosen to highlight results from studies of a context that is similar to the Swedish one.[2] When we initiated the work on the report in the summer of 2020, we did not know to what extent we would have access to relevant and reliable data sources covering the COVID-19 pandemic and its effects on children and youth. To the extent that we have found such data we have chosen to present them as a background for assessing the possible effects of the pandemic based on previous research.

[1] Human capital is a collective term for knowledge, skills and health.

[2] The selection of studies has not been systematic. It is based on the authors' assessment of which studies reflect the prevailing consensus in the literature, if any, and which studies the authors consider relevant and credible in this context.

The current statistics presented in the report are, for the most part, available on the official websites of public authorities and organisations. We have also used information from current research studies that examine the effects of the pandemic.[3] Information published in the media has occasionally also been used, to the extent that the source can be considered reliable. Yet, the flow of new information and research concerning the pandemic is considerable, and during the autumn (November–December 2020) we had to draw a line after which we were unable to incorporate new data. Moreover, it is a delicate task to assess what is to be regarded of sufficiently good quality, before the standard peer review processes are completed. Therefore, this new research is cited only to a limited extent. However, the aim of this report has rather been to apply insights from previous research on the present situation to highlight how the ongoing COVID-19 pandemic affects different aspects of the home environment of children and youth, their schooling, education and early adulthood.

Time will have to pass before it is possible to quantify the consequences for children and youth of the COVID-19 pandemic, and to evaluate measures and interventions prompted by the pandemic. We hope that the areas we highlight in the report, and the research that already exists, can form a basis for a further discussion of how policy can be designed to deal with the consequences of the pandemic, and to reduce its negative effects on children and youth.

[3] In some cases, the authors have also gained access to aggregated data from e.g. the Swedish Pregnancy Register. In the absence of national statistics on absenteeism among teachers and pupils at school, data from Skola24 and Previa have been used.

# 2 Childhood circumstances and the Covid-19 pandemic

**Hanna Mühlrad and Anna Sjögren**

It's well documented that early life conditions are important for long-term outcomes including health, cognitive skills, educational and labour market outcomes, and life expectancy (Almond et al. 2018). The main conclusion of this strand on literature is that circumstances early in life, in utero as well as during early childhood, affect children's human capital formation, i.e. the acquisition and accumulation of health and cognition early in life lays the foundation for the endowments available to us as adults.[4] One reason is that positive and negative circumstances early in life, during the so-called sensitive periods, may affect children's opportunities to acquire human capital investments during childhood and later in adolescence (Cunha and Heckman, 2008). There are many dimensions of life that influence and shape childhood circumstances including the parents, siblings and grandparents, home environment, school and healthcare quality and the existing social safety net.

The Covid-19 pandemic has had an overwhelming impact on society with a massive slowdown of activity, and government measures and adoption of nonpharmaceutical interventions (NPIs) to slow or prevent contagion. Considering this, we discuss different aspects of how the pandemic during 2020 has affected childhood circumstances and its potential long-lasting implications. This chapter focuses on early childhood conditions and the family environment. In the next chapter, preschools and schools are discussed.

We begin by describing how children and their families were directly affected by COVID-19 during 2020, in terms of confirmed infections, severe illness and deaths. Based on the findings in previous studies, we discuss how exposure to the COVID-19 pandemic in utero and during early childhood, both directly and indirectly, may affect human capital development. We further discuss how the pandemic has affected domestic violence and family distress and dysfunction. We also examine whether children's exposure to parental unemployment and

[4] We use human capital as a collective term for knowledge, skills and health. Human capital investments refer to activities that promote the development of an individual's human capital. Education and healthcare, but also parenting and care, can thus be seen as investments in human capital.

financial distress within the family changed in 2020 and discuss the extent to which this may affect child development. The section concludes with a general discussion.

## 2.1 Infection, disease and death among children and parents as a result of COVID-19

During February–November 2020, approximately 39,000 children in the ages of 0–9 were confirmed to be infected with COVID-19. During the same time period, 39 children were treated for COVID-19 in an intensive care unit (ICU), and 5 children died due to COVID-19 (The Public Health Agency of Sweden, 2020a). The incidence of confirmed infections among children is lower than in the overall population.[5] There could be multiple explanations for this, including children being less likely to get infected, but it could also reflect the fact that the testing of children has been much more restricted than for the adult population. During fall 2020, as testing among school children expanded and became more easily accessible the number of confirmed COVID-19 cases among teenagers was at the same level as among young adults. Yet, compared to the older population, children and adolescents generally have milder symptoms (The Public Health Agency of Sweden, 2020b).[6] However, it is premature to draw conclusions regarding the possible long-term consequences of COVID-19 infections, so called post-COVID-19 symptoms, for children and adolescents.

Although children and young adults are unlikely to suffer from severe COVID-19, they can be indirectly affected by their parents and relatives becoming severely ill or dying from COVID-19. In addition to having a negative impact on school attendance and well-being in the short term, exposure to parental illness, or worse, losing a family member can have negative consequences for educational attainment and income in adulthood (see, for example, Mörk, et al. 2014b; Adda et al. 2011; Kalil et al. 2015).

We do not have access to data on the number of children whose parent suffered from severe COVID-19 or passed away. However, according to Vlachos, et al. (2021) the number of confirmed cases among parents of children

[5] Relating data from the Public Health Agency of Sweden to the size of the population at the end of 2019, in mid-December 2020 the total number of confirmed cases was just over 338 per 100,000 children aged 0-9, 3,017 per 100,000 aged 10-19, and 3,391 per 100,000 in the population as a whole. The information is available at www.folkhalsomyndigheten.se and at Statistics Sweden www.scb.se. Data retrieved on 2020-12-16.

[6] Again, relating data from the Public Health Agency of Sweden relates to the size of the population at the end of 2019, according to Statistics Sweden, the number of ICU cases and deaths was 1.2 and 0.34 per 100,000 respectively in the age range 0-9 years, 2.1 and 0.09 per 100,000 respectively in the age range 10-19 years, and 36 and 76 per 100,000 respectively in the population as a whole. See footnote 6 for links to the websites.

in secondary and upper-secondary school during the spring 2020 was 8.75 per 1,000 (a total of 5,154 parents). The number of parents who were hospitalized with a COVID-19 was significantly lower, 2.36 per 1,000 (almost 1,400 parents). 57 out of a total of almost 590,000 parents of children in secondary and upper-secondary school died of COVID-19 in the spring of 2020. Assuming that parents of younger children, in view of their likely younger age, were affected to a lesser extent than parents of older school children, 5 children per 1,000 constitutes an upper bound for the fraction of children exposed to serious parental illness due to COVID-19 in the spring of 2020.[7]

The longer the pandemic continues, more people, including parents, will get infected, but the direct effects on children appear rather limited. Data from Statistics Sweden show that the overall mortality among individuals aged 0-64 years, during the first nine months of the pandemic, was not higher than during previous years. Hence there was likely no significant increase in the number of children who lost a parent, although more children suffered the loss of an elderly relative during the first year of the pandemic. [8]

We conclude that the direct impact of the pandemic on children's and adolescent's human capital development, through their own illness or that of a parent or sibling, appear to be limited. However, due to the lack of knowledge about the long-term consequences of COVID-19 infection in children, we cannot rule out a potential direct impact of the pandemic on child development. Moreover, for families who have suffered from severe illness or death, we cannot discard that the pandemic may have caused a more difficult grief processing due to visiting restrictions in hospitals and nursing homes, and because old relatives have passed away without the company of their close ones. Parents may thus find it more difficult to help their children in their mourning process compared to normal times.

## 2.2 Human capital development in the foetal stage and early childhood

It is well documented that human capital development starts already during the foetal stage, and that unfavourable conditions for the mother, such as serious illness or severe anxiety and stress during pregnancy, risk impeding this development. Adverse health shocks in utero may result in more complications during pregnancy and birth (Almond et al. 2012) including preterm delivery and

[7] The calculation is based on children having two parents and hence that 4.72 (2 x 2.36) children out of 1,000 in secondary school and upper-secondary school had at least one parent with severe COVID-19.
[8] Statistics Sweden (2020a).

low birthweight, which may in turn lead to lifelong consequences for health outcomes, educational attainment and labour market participation (Almond et al. 2018).

It is important to emphasize that the COVID-19 pandemic is likely to have both direct and indirect effects on human capital formation. COVID-19 during pregnancy or in early childhood can have a direct negative impact on the somatic health, affecting human capital development (Almond, et al. 2012). There may also be indirect effects of the pandemic on human capital development due to increased maternal stress and anxiety, reduced family income and risk for increased conflict in the home (Almond et al. 2018). Moreover, it can be difficult to disentangle these effects from one another, and there can also be significant interaction effects between them.

It is possible to limit the impact on human capital development of negative circumstances through social interventions during childhood such as improved access to high quality care. Previous research shows how the impediment of human capital development as a result of, for example, the dramatic loss of parental income during the child's first year of life, can be mitigated by poverty reduction programmes to compensate for unfavourable conditions in the affected families (Adhvaryu, et al. 2018). Given this, policy interventions aimed at vulnerable families in a time of extensive crises have the potential to counteract the negative impact on children's human capital development.

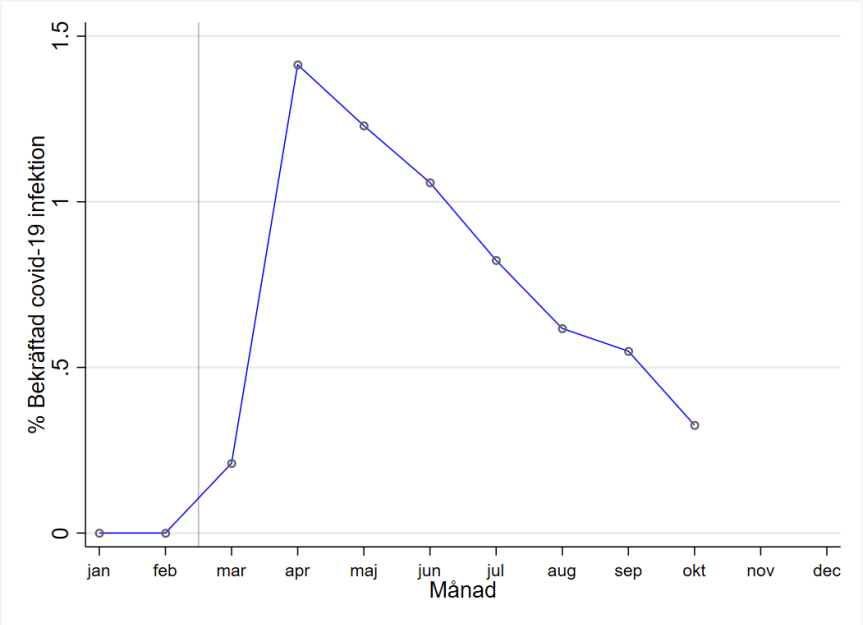
### 2.2.1 Infection and childbirth outcomes during the pandemic

To date, December 2020, there is no data on the overall incidence of COVID-19 among pregnant women in Sweden. According to the Pregnancy Register, 1.5–2 percent of all women had an ongoing infection at the time of delivery in April 2020.[9] The proportion of confirmed COVID-19 in women giving birth then fell to below 0.5 percent from mid-July to early October (see Figure 1). As in the overall population, in November 2020, the proportion of confirmed COVID-19 cases among women giving birth rose again.[10] However, there are large regional differences, with rates in metropolitan areas exceeding rates in rural areas.

[9] The testing strategy for COVID-19 differs in different regions and in different clinics. Some regions test all pregnant women when they give birth or during inpatient care, while others test only symptomatic women. This figure should therefore be interpreted as the lower limit for ongoing COVID-19 infection among pregnant women.

[10] www.graviditetsregistret.se, 2020-12-16. However, there may be a backlog in reporting, and the most current information may thus be subject to uncertainty.

**Figure 1** Proportion of women with ongoing COVID-19 infection at the time of birth, or in inpatient care, registered in the Pregnancy Register.



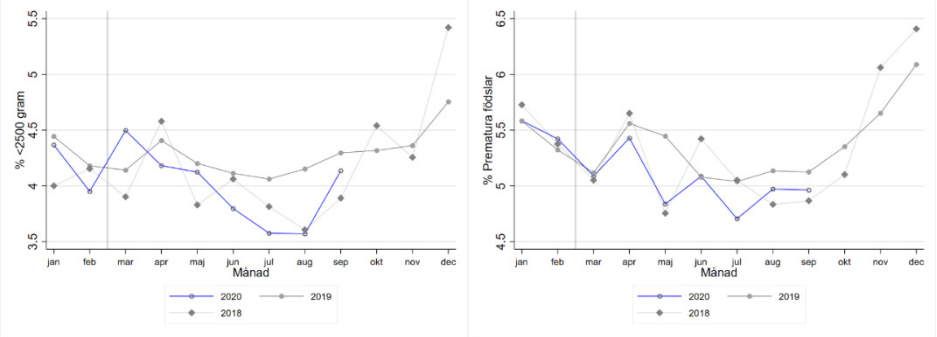

Source: The Pregnancy Register, October 2020.

Research about the effects of COVID-19 infection on the health of new-borns and their mothers is scarce, but studies suggest that severe COVID-19 may increase the risk of complications during pregnancy and childbirth (Remaeus, et al. 2020). A meta-analysis by Allotey, et al. (2020) of 77 scientific medical articles from Belgium, Brazil, Denmark, Israel, Italy, China, Mexico, Spain and the USA, among others, suggests that COVID-19 increases the need for intensive care for pregnant women, especially among older mothers who are overweight or obese. There are a few Swedish studies regarding the effects of COVID-19 on maternal and neonatal health. In a matched control study of 155 women with confirmed COVID-19 at the time of childbirth, there was no significant difference in birth complications for mother and child, except for a slightly elevated risk of pre-eclampsia (Ahlberg, et al. 2020).

Using aggregate information from the Pregnancy Register until September 2020, we find little evidence to suggest a negative impact of the pandemic on the health of mothers and their new-borns. Compared to the same period 2018–2019, maternal and neonatal health even appear to be slightly improved. In figure 2, we present information from the Pregnancy Register on maternal and neonatal health between January 2018 and September 2020. These data do not show any clear increase in the proportion of preterm births, infants with low birth weight

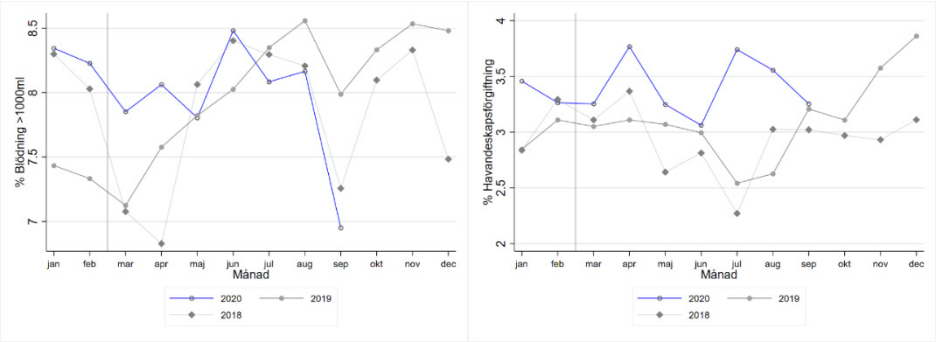
(< 2,500 g) (see Figure 2a-b), pre-eclampsia or postpartum haemorrhage (see Figure 3a-b). It should be emphasized, however, that these data do not include children who were exposed to COVID-19 infection indirectly (due to maternal illness) in the first trimester, i.e. during the first three months, as they had not yet been born in September 2020.

**Figure 2** (a) The proportion of babies born earlier than 37 weeks
(b) The proportion of babies born with a birth weight of less than 2,500 grams.




*Source*: The Pregnancy Register, October 2020.

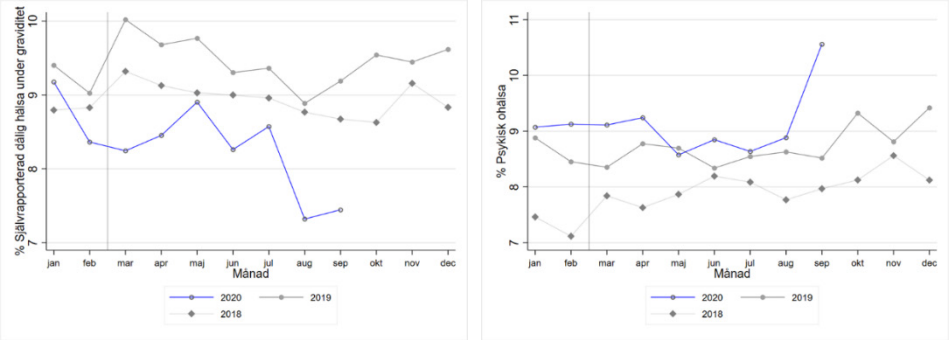
**Figure 3** (a) The proportion of mothers with pre-eclampsia
(b) The proportion of mothers with major postpartum haemorrhage




*Source:* The Pregnancy Register, October 2020.

It is possible that the pandemic has led to increased stress and anxiety for pregnant women, in terms of fearing serious illness or having to give birth without the company of a partner. A longitudinal survey of almost 7,000 pregnant women showed that pregnant women feel considerable anxiety and fear for their health or for their family members (Naurin et al. 2020). However, data from the Pregnancy Register show that fewer women reported being in poor or very poor health during pregnancy in 2020, compared to 2018 and 2019 (see Figure 4a). At the same time, among women who gave birth in September, we note an increase in the proportion of women who reported suffering from mental illness at the time of their first prenatal care appointment (i.e. in week 8–12) (see figure 4b).

**Figure 4** (a) the proportion of mothers with self-assessed poor or very poor health during pregnancy
(b) the proportion of mothers with mental ill health during pregnancy.




*Source:* The Pregnancy Register, October 2020.

In contrast to studies suggesting a negative impact of the pandemic on maternal and neonatal health, there are also studies documenting improvements in maternal and neonatal health during the pandemic from a number of countries including Denmark (Hedermann et al. 2020), Ireland (Philip et al. 2020) and the Netherlands (Been et al. 2020).[11] It has been suggested that a reduction in exposure to other types of infections, less demanding and stressful job situations for women, as well as reduced air pollution as a result of the pandemic may have contributed to this development (Been et al. 2020).[12]

### 2.2.2 Potential long-run consequences of the COVID-19 pandemic

As of December 2020, it is difficult to assess the impact of the COVID-19 pandemic on foetal and early childhood human capital development. However, previous research has emphasized the harmful impacts of unfavourable events such as infectious diseases and stress during the foetal stage for long-run outcomes.[13]

[11] Been et al. (2020) use the sudden appearance of the pandemic and subsequent restrictions to evaluate effects on neonatal health using a quasi-experimental design (a so-called differences-in-discontinuities analysis) in the Netherlands.
[12] If the pandemic has led to increased incidences of miscarriage, it cannot be ruled out that there are selection effects that could have affected the results.
[13] The Zika virus and the Ebola epidemic have been studied (WHO, 2016), as well as infectious diseases and pandemics earlier in history.

One extensively studied example is the Spanish flu, which affected approximately half a billion people globally 1918–1920 and caused between 17 and 50 million deaths. Individuals in the USA who were exposed to the Spanish flu in utero had worse educational outcomes as adults, were more likely to be disabled, had lower income and lower socio-economic status (Almond, 2006). The negative impacts of the Spanish flu also persisted to retirement age (Almond and Mazumder, 2005). There are similar findings in Sweden: cohorts exposed in utero to the Spanish flu had higher rates of mortality during ages 54–87. Higher mortality rates were attributed to higher prevalence of cancer and heart disease. Unlike the USA, no impacts of the Spanish flu on earnings or educational attainment have been found in Sweden (Helgertz and Bengtsson, 2019).[14]

It should be emphasized that there are large differences between COVID-19 pandemic and the Spanish flu. For example, the Spanish flu had the highest mortality rate among people of fertile age, while COVID-19 has the highest mortality rate among the elderly. Another difference is that in modern-day Sweden, we have a robust welfare system with good access to healthcare and rehabilitation for individuals who suffer from severe illness or other unfavourable events in life. This safety net has a potential to mitigate the negative impacts of COVID-19 on human capital formation. Thus, compared to the Spanish flu, the long-run impact of COVID-19 on human capital formation is likely to be smaller (Schwandt, 2020).

The COVID-19 pandemic may have caused stress and anxiety among pregnant women. Previous studies have showed that stress during pregnancy is a risk factor for complications such as preterm birth and low birth weight. In utero exposure to maternal stress from family ruptures have been linked to neuropsychiatric illnesses such as ADHD (Persson and Rossin-Slater, 2018), as well as worse school outcomes (Aizer et al. 2016), and higher incidence of mental disorders in adulthood (Adhvaryu et al. 2019). Based on previous studies, it is thus possible that the COVID-19 pandemic will impact human capital formation, which in turn may led to potentially long-term consequences for future health, education and labour market outcomes.

In summary, research shows that exposure to adverse shock in utero and during early childhood may have negative consequences for human capital formation, with persistent effects into adulthood (Almond et al. 2012). A pandemic, such as the current COVID-19 pandemic, may also have indirect effects on human capital development because of increased stress. Despite the lack of clear adverse effects on birth outcomes among infants born during the

[14] But there are indications that the Spanish flu led to increased poverty (Karlsson et al. 2014).

pandemic up until the autumn of 2020, it should be emphasized that it is yet too early to assess the effects of COVID-19 on human capital development.

## 2.3 Exposure to family distress and dysfunction

The Public Health Agency of Sweden has issued a number of NPIs, recommending people to stay at home at the slightest symptom of COVID-19, to avoid social events and activities, and to work from home. This has confined families to their homes to a larger extent and to fewer social contacts than usual. Indeed, workplace absenteeism increased by 40 percent in Sweden in April and March 2020 compared to previous years (Hensvik and Nordström Skans, 2020). Statistics from the Social Insurance Agency also show that applications for temporary parental benefits (TPB) to care for sick children were approximately 33 percent higher for the period from March–August 2020 compared to the same period in 2019.[15] At the same time, the number of children who at some point stayed at home with a parent on TPB increased by a mere 6–7 percent.[16]

The impact on children of spending more time at home together with their parents will largely depend on the pre-existing family environment. A family environment that is stimulating and safe can improve and enhance child development, while a family situation characterized by conflicts and abuse can harm the child and its development (see e.g. Fiorini and Keane, 2014; Delbono et al. 2016; Francesconi and Heckman, 2016). The pandemic has potentially increased the strain on families with pre-existing distress and dysfunction, as the lack of social activities can cause greater vulnerability and isolation (UNICEF, 2020). Reduced social interaction (outside of one's home) may imply a weakening of social networks, which is problematic for families with distress and dysfunction. Previous research shows that social networks are of particular importance to individuals in families with domestic violence and substance abuse (National Board of Health and Welfare, 2016).

Anecdotal evidence from women's shelters worldwide suggests that a combination of economic and social stresses brought on by the pandemic, as well as the NPIs to prevent the spread of the disease, have increased the number of women and children facing abuse. The World Health Organisation, WHO, has

[15] There are approximately 1.5 million children in the age range from 1–12, whose parents are entitled to TPB. In 2019, approximately 1.5 million TPB days were paid out during the period from March–August, and approximately 40 percent of all children were at home with a parent on TPB at some point. During the corresponding period in 2020, approximately 2.1 million days were paid out, and the proportion of children who were at home with a parent on TPB was somewhat higher, at around 43 percent.

[16] See section 3 for a more detailed description of pre-school and school attendance and absenteeism.

also emphasized the need for governments to protect women and children during the pandemic by quickly responding to increased incidence of mental illness, domestic violence and substance abuse.

Domestic violence has been shown to have considerable adverse consequences for women's somatic and mental health (Bacchus et al. 2018; Campbell and Lewandowski, 1997; Durevall and Lindskog, 2015; McCaulley et al. 1995; Clarke et al. 2007). Similarly, children who are exposed to domestic violence tend to have worse health outcomes in both the short and long run (Monnat and Chandler, 2015).

### 2.3.1 COVID-19 and anxiety in families

The COVID-19 pandemic has put many families under considerable strain. Many parents worry about contracting and transmitting the virus, the labour market situation, working from home at the same time as taking care of their children, teenagers faced with online schooling and limited opportunities for social activities. NGO's such as Children's Rights in Society (BRIS) and women's shelters across Sweden have reported signs of increasing vulnerability for women and children. BRIS reports a 20 percent increase in the number of calls from children in 2020, compared to 2019. They also report that the number of calls concerning violence, distress and family conflict increased considerably during the spring and summer of 2020 compared to the previous year (BRIS, 2020). During 2020, there were also more children calling BRIS because they were feeling depressed. WHO reports that calls to women's shelters within the EU increased by 60 percent in the spring of 2020 (UN, 2020). Similarly, the Swedish federation of women's shelters, Unizon, reported that the number of calls increased by between 20–40 percent during the pandemic (SVT, 2020).

To date, December 2020, preliminary statistics from the Swedish National Council for Crime Prevention (BRÅ), however, do not show any evident change or trend break in the number of reported crimes connected to the COVID-19 pandemic (BRÅ, 2020). Assault and battery of women perpetrated by intimate partner or acquaintance (including gross violation of a woman's integrity) increased in 2020 compared to 2019, but this increase began before the onset of the COVID-19 pandemic (BRÅ, 2020). Moreover, the increase in the number of reported cases of assault and battery coincides with altered reporting procedures at BRÅ. Thus, it is difficult to interpret the increase in 2020 to be a consequence of the pandemic. At the same time, it is important to remember that these data only concern reported crimes, and there is a risk of under-reporting, particularly regarding intimate partner violence. It is also possible that the tendency to report

a crime perpetrated within the family has been affected by the increased isolation and lack of external contacts during the pandemic.

Violence and conflicts in the family often coincide with excessive alcohol consumption. The Swedish Alcohol Helpline (Alkohollinjen) has indeed received more calls during the pandemic than they did previously (SVT, 2020). Yet, while there was an increase in alcohol sales in the spring and summer of 2020, the sales of alcohol in bars and restaurants, as well as private imports, decreased during the same period. Thus, it is difficult to determine whether the overall alcohol consumption changed (CAN, 2020). Evidence based on survey data suggests that alcohol consumption has not increased during the pandemic (CAN, 2020).

Another sign that may suggest that families have experienced increased stress during the pandemic is the fact that more parents filed for divorce in the spring of 2020 compared to the corresponding period in previous years. In the period from March–July the number of divorces increased by approximately 5 percent.[17] We cannot rule out that the increased filing for divorce during the early stages of pandemic is driven by an anticipation of divorces that would have happened anyway at a later stage. Hence, the long-run effects on children are unclear. It is well established that children whose parents divorce when they are young tend to have worse educational outcomes (Sandefur et al. 1992; Jonsson and Gähler, 1997). It is however recognized that this association in part reflects underlying factors in the family that increase the risk for divorce, rather than effects of experiencing a divorce per se (Piketty, 2003; Björklund and Sundström, 2005). At the same time, it is possible that experiencing conflict at home adversely affects the welfare and school performance of children, with the risk of negative long run consequences.

According to a comprehensive survey conducted by the WHO, mental illness has increased during the COVID-19 pandemic. For some individuals, many of whom already suffered from mental disorders, the pandemic has led to increased isolation, anxiety and stress about infection, as well as loss of income. The pandemic has also limited access to the provision of care for mental disorders, increasing the risk of substance abuse, sleeping difficulties (insomnia) and severe anxiety (WHO, 2020).[18] However, administrative data from the National Board of Health and Welfare do not show an increase in the number of patients treated

[17] Data obtained from https://www.svt.se/nyheter/inrikes/fler-ansoker-om-skilsmassa-under-covid-19. However, it is not clear from the reporting precisely how children's families were affected.

[18] A child growing up in a family with parents suffering from grave psychological disorders risks poorer human capital development, with worse health and socioeconomic outcomes, in the short as well as the longer term (Monnat and Chandler, 2015).

for psychiatric diseases in either inpatient or outpatient care. Neither is there an increase in prescription drugs use related to mental health problems. Instead, the number of patients treated for depression or anxiety has even fallen slightly in 2020 compared to the years 2015–2019, with the greatest decline among individuals aged 18–24.[19] This decline is driven by fewer new patients. It is currently difficult to determine the reasons for this decline. It is possible that individuals with mental health issues had poorer access to health care, or were less willing to seek health care, during the pandemic. Thus, it is possible that the need of psychiatric care may increase in the near future (National Board of Health and Welfare, 2020).

Summing up, there are several reasons to believe that the COVID-19 pandemic may impact the human capital development of children and adolescents through effects on increased distress, conflict and stress in the family environment. However, available administrative data do not, as of December 2020, suggest that the pandemic has caused any dramatic increase in reported domestic violence, alcohol consumption, or mental health issues. Nevertheless, we cannot rule out that there is considerable under-reporting or lagged reporting for these outcomes. It should also be emphasized that there may be substantial variation in how families and children are affected by the pandemic. While increased time at home and social isolation may cause conflict and stress for children in disadvantaged families, there may of course be families where more time together is beneficial for child development. Hence, there is a risk that the COVID-19 pandemic exacerbates already existing inequalities in children's circumstances. Going forward, it is important to closely monitor the development of social gradients in mental health and school performance of children and adolescents.

## 2.4 Parental unemployment and financial distress

The COVID-19 pandemic has contributed to a massive decline in economic activity and to a severe contraction of the labour market. As a consequence, many workers, in particular those on fixed-term or hourly contracts, have lost their jobs and new job postings have plummeted. Many employers have also made use of government subsidies to implement short-time work schemes for permanent employees.[20] As a measure to ease the labour market consequences,

[19] Mental ill health refers to psychiatric conditions that are diagnosed in accordance with ICD-10, as well as the consumption of psychopharmacological prescription drugs. The survey also shows that the availability of psychiatric care has not declined as a consequence of the pandemic (National Board of Health and Welfare, 2020).

[20] Short-time work schemes imply a reduction by 20–80 percent of work hours for the workers. The cost of the scheme is shared by the government, the employer and the worker whose salary

unemployment insurance coverage has been extended to groups with little labour market attachment and benefit levels increased (Forslund, 2020).

During the spring and summer of 2020, overall unemployment increased from almost 7 to over 9 percent. In November the unemployment rate was just shy of 8 percent. This section explores how families have been affected by the economic downturn caused by the COVID-19 pandemic through effects on parental unemployment, financial distress and poverty. We use the Swedish Labour Force Survey (AKU) (Statistics Sweden, 2020b) to describe the development of unemployment among parents in 2020 compared to 2019.[21] We also present recent developments of the number of children whose families receive means tested social assistance (SA), which is the ultimate social safety net available for families who are unable to support themselves or who experience financial distress. In light of previous research, we discuss how children may be affected by the current situation.

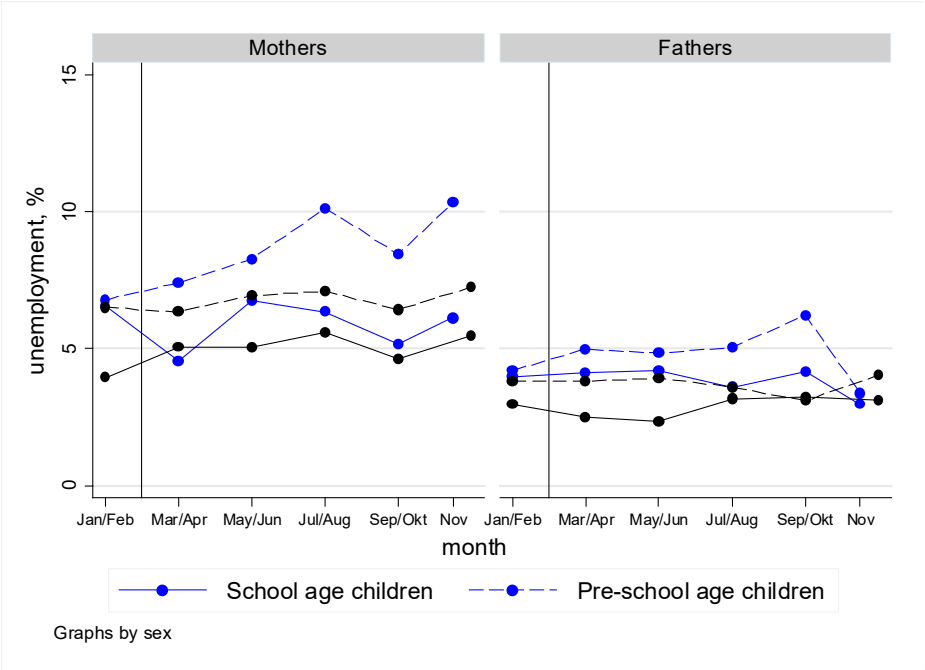
### 2.4.1 Parental unemployment and financial distress during the COVID-19 pandemic

Figure 5 shows the development of parental unemployment, mothers to the left and fathers to the right, through November 2020 (blue lines) compared to 2019 (black lines), based on data from Statistics Sweden's Labour Force Surveys (AKU). Solid lines represent parents with school children (7–18 years of age), and dotted lines represent parents of pre-school age children (0–6 years of age).

is reduced by 4–12 percent or more if the initial salary is above the cat which is SEK 44000 per month. See Hensvik and Nordström Skans (2020) for further description of the short time work scheme policy. See https://www.google.com/Covid19/mobility/ for data on movement, and Forslund (2020) for discussion of labour market consequences. Data from the Labour Force Survey (LFS) are available at www.scb.se.

[21] Unfortunately, there is a greater number of measurement errors than normal in the LFS statistics for 2019. For this reason, we aggregated the data into two-month averages. Statistics Sweden (2020c).

**Figure 5** Unemployment in 2020 (blue) compared to 2019 (black) among parents of school children (7–18 years of age) and parents of pre-school age children (0–6 years of age).




*Source:* Own calculations based on AKU, Statistics Sweden. The final data point for 2020 is only based on data from November. The corresponding data point for 2019 is based on November and December.

In the first months of 2020, unemployment among mothers was around 7 percent. From March 2020, the onset of the pandemic, unemployment increased among mothers of small children, following the overall labour market development. Unemployment in this group reached 10 percent at the end of the summer. The autumn saw some improvement in labour market outcomes, but in November 2020, unemployment was again just over 10 percent. However, among mothers of school children, unemployment did not rise in 2020[22]: unemployment hovered around 6 percent and was even somewhat lower in November than in the beginning of the year. A first observation, turning to the figure on the right-hand side, is that unemployment among fathers is lower than among mothers. In the beginning of 2020, it was just over 4 percent. Over the course of the year, unemployment rose among fathers of small children, and in September/October

[22] The decline in unemployment among mothers of school children observed in March/April is consequence of a decline in the labour force participation rate of this group early in the pandemic. Thus, it is not the case that more mothers in this group found employment.

it approached 7 percent. November saw a strong recovery in labour market outcomes. Among fathers of school children, unemployment remained stable in the first half of 2020, and then subsequently fell to approximately 3 percent in November.

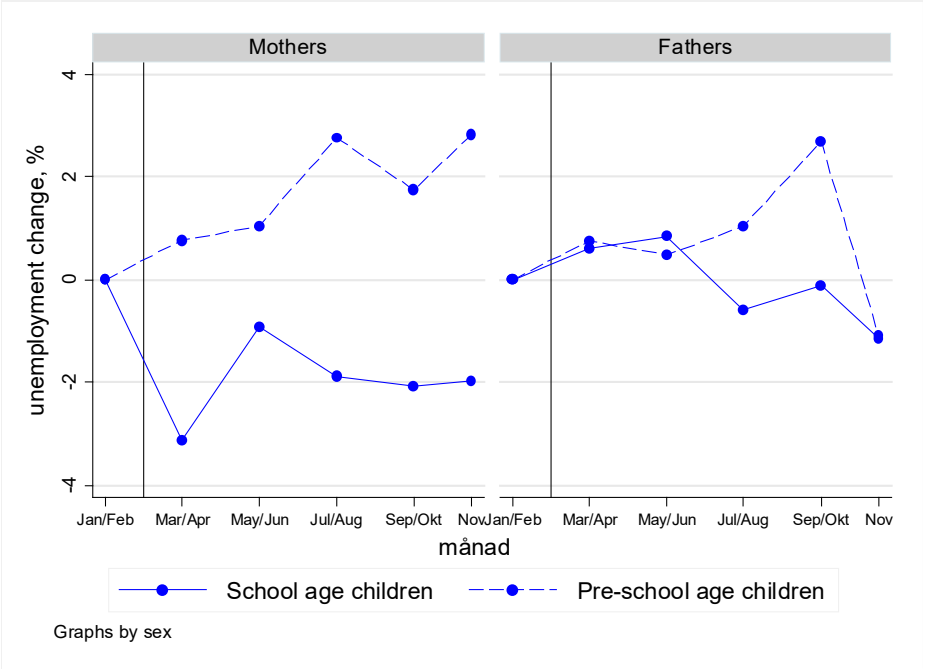
Based on these figures, it seems that parents of younger children have been more adversely affected by the labour market contraction that has followed in the wake of the pandemic than parents of older children. There are several possible reasons for this. Parents of younger children are likely to be younger and consequently also likely to have a weaker labour market attachment, e.g. more likely to work on fixed-term or hourly contracts. It is also possible that a larger fraction of them works in the severely impacted hospitality industry, which employs a relatively young workforce. Thus, parents of young children are more likely to have lost jobs with fixed-term and hourly contracts, while parents of older children may for the most part have kept their jobs thanks to short time work schemes.

It is difficult to know how unemployment would have developed in 2020 if society had not been hit by the COVID-19 pandemic. The sharp increase in layoff notices and the decrease in economic activity as early as March and April, make it reasonable to assume that the increase in unemployment is also a consequence of the pandemic. At the same time, the development in 2019, shown in Figure 5, suggests that there was a weak upward trend in unemployment, at least for women, even before the pandemic. Furthermore, there is usually a certain seasonal variation in unemployment throughout the year. In Figure 6, we therefore present how the unemployment rate, of the groups studied in Figure 5, has changed over 2020 compared to its January/February level, netting out the 2019 trend.

The pattern from Figure 5 becomes very clear in Figure 6, namely that it is among parents of young children, both mothers and fathers, that unemployment increased in 2020 compared to 2019. Among mothers of young children, the increase was about 2 percentage points, which corresponds to an increase of almost 30 percent compared with the level in the beginning of the year. Among fathers of young children, the increase of 2 to 3 percentage points by the early autumn corresponds to a more than 50 percent increase in unemployment, before the recovery in the late autumn. Among parents of school children, we do not see the same negative development. Instead, unemployment among mothers of school-age children decreased by about 2 percentage points, and by about 1 percentage point among fathers. Taking a closer look at these positive

developments, they do seem to reflect increases in employment.[23] However, determining whether this increase in employment is a consequence of increased demand for certain types of labour as a result of the pandemic, requires more detailed data than is available at this stage.

**Figure 6** The change in unemployment since January/February 2020 among parents of school children (7–18 years of age) and parents of pre-school age children (0–6 years of age), net off the 2019 level.




*Source:* Own computations based on AKU, Statistics Sweden. Calculations based on LFS, Statistics Sweden. Note: The figure shows $(Unemployment_{2020,\,t} - Unemployment_{2020,\,Jan/Feb}) - (Unemployment_{2019\,t} - Unemployment_{2019,\,Jan/Feb})$, where t = [Jan/Feb,..., Sept/Oct, Nov]. The last data point for 2020 is based solely on November data.

We can conclude that a larger share of Swedish preschool children had parents who did not have a job at the end to the summer of 2020 than at the same time in 2019. It is likely that part of this development is a consequence of the COVID-19 pandemic. At the same time, we also find that slightly fewer school children had an unemployed parent when they returned to school after the summer

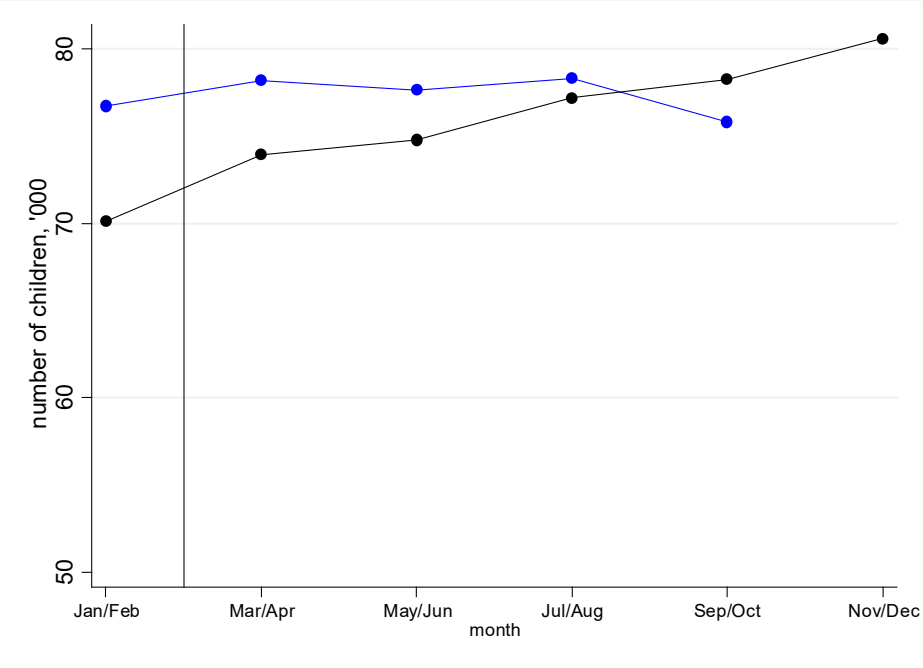
[23] It is evident from AKU that the share in employment increased by almost 2 percentage points in this group. https://www.scb.se/hitta-statistik/statistik-efter-amne/arbetsmarknad/arbetskraftsundersokningar/arbetskraftsundersokningarna-aku/

holidays in 2020 than in 2019. The fact that parents of school children have managed comparatively well may be due to the fact that they are older and more established in the labour market. Thus, they are more likely to benefit from the short time work schemes introduced to protect employment during the pandemic. Older workers are also less likely to be employed in the most severely hit service and hospitality industries.

Increased unemployment is a strain on families' finances. Despite this, the number of children living in families receiving means tested social assistance (SA) did not increase during the first ten months of 2020. This is clear from Figure 7. The number of children whose families received SA was higher in the beginning of 2020 than in 2019, but the number of children whose families received financial assistance shows no tendency to increase with the onset of the COVID-19 pandemic in 2020, on the contrary. If we assume that the increasing trend in 2019 would have continued in 2020, had it not been for the pandemic, it instead looks as if the number of children in families receiving SA decreased in 2020. This, rather surprising development, has been noted by National Board of Health and Welfare (2020).

Why do we observe this? It is possible that extended unemployment insurance coverage and more generous unemployment benefits introduced at the early stages of the COVID-19 pandemic have contributed to this outcome. Parents who previously did not meet the qualifying conditions for receiving unemployment benefits may have gained access to unemployment benefit due to the change of rules. Together with higher benefit levels, this may have provided more families with an alternative to applying for social assistance than would otherwise have been the case. The absence of an increase in families on SA, may also be due to the fact that many of the families, who have been severely hit financially during the COVID-19 pandemic, are not eligible for SA. SA is means-tested not only in relation to a family's income but also in relation to assets. The fact that the number of families receiving SA has not increased hence does not preclude that there has been an increase in the number of families exposed to financial stress who are concern for their ability to maintain the standard of living to which they are accustomed.

**Figure 7** Children in families receiving means tested social assistance per two-month period in 2020 (blue) compared with 2019 (grey).




*Source:* Calculations based on statistics from the National Board of Health and Welfare.

In summary, the majority of Swedish families have been spared increased unemployment and acute financial distress despite the pandemic. It is mainly among parents of small children that we observe an increase in unemployment. This increase corresponds to about 2 percent of all parents of small children, or about 10,000 mothers and 15,000 fathers. At the same time, the crisis is not over, and if it persists, more people are likely to lose their jobs as the economic downturn spreads to sectors that are not yet directly affected. Furthermore, families who have seen their earnings drop and who are not currently entitled to SA, risk depleting their savings. The situation will also become even more severe for families who have recently arrived in Sweden, and who already before the pandemic experienced difficulties entering the labour market.

### 2.4.2 Effects of unemployment and financial vulnerability on children

There is an extensive research literature showing that children exposed to financial distress and parental unemployment have worse educational and health outcomes than other children, and that the consequences of childhood

disadvantage may persist into adulthood.[24] In assessing possible effects of the COVID-19 pandemic for Swedish children, we first focus on some Swedish studies that are of particular relevance. Institutional differences between countries, such as differences in unemployment insurance and access to welfare services are reasons why results might vary across different countries, and may explain why effects on children are often found to be less pronounced in Sweden than in studies of e.g. North America..

Mörk et al. (2014a, b) study the effects of parental unemployment and receipt of social assistance on child health. In Mörk et al. (2014a) it is shown that children of unemployed parents are 17 percent more likely to be hospitalized than children whose parents are employed. In Mörk et al. (2014b), it is further shown that children in families receiving social assistance (SA) are 40 percent more likely to require some kind of hospital care and that they are as much as 189 percent more likely to be hospitalized with a psychiatric diagnosis than other children.[25] However, the studies also show that these strong associations are due largely to underlying factors relating to the parents and to the child's environment, rather than being direct causal effects of unemployment or dependency on social assistance: When Mörk et al. (2014 a, b) instead compare the health of a given child during the years when one of the parents was unemployed or when the family received social assistance to the health of the child in years when the parents were employed or family did not receive social assistance the estimated increased risk of hospitalization is found to be much smaller: The increased risk of hospitalization due to parental unemployment is 5 percent and estimated increased risk of hospitalization in years when the family receives social assistance is 7 percent, while the increase in hospitalizations with a psychiatric diagnosis is 38 percent. These estimates come closer to what can be considered causal effects of parental unemployment or the family needing to seek social assistance and are thus relevant when assessing the potential effects of the COVID-19 pandemic. Mörk et al. (2014a) further show that maternal unemployment is driving the effects, and that there is no significant increase in hospitalization risk resulting from paternal unemployment.

In another study Mörk et al. (2020) instead examine the effects on child health and school results of parental job-loss as a result of a workplace closure, i.e. a situation that might not be too different from the job-loss that has affected families during the coronavirus pandemic. Although this study shows that family disposable income suffers, in part as a result of a prolonged increased risk of

[24] See e.g. Oreopoulus et al. (2008); Page et al. 2009). Stevens and Schaller (2011); Rege et al (2011), Mörk et al. (2014)a; (2014a) and (2020); Page et al, (2019); Peter, (2016)

unemployment, the effects on the children are quite limited: The study finds no adverse health effects in the short or long term, but children who are in lower secondary school when their mother loses her job receive significantly lower compulsory school grades (by about 5 percent of a standard deviation).[26] There is, however, no effect on school results for younger children, nor is there an effect of paternal job-loss. Using a similar strategy, Rege et al. (2011) instead find that Norwegian children's school results are negatively affected when their father loses his job, but they find no significant effects of maternal job-loss.

As mentioned, compared to studies of parental job-loss from other countries, the Swedish results show that the effects are rather limited and that the effects are more pronounced in the case of maternal job-losses. Stevens and Schaller (2011) find larger negative effects on American children's school results as a result of parents losing their jobs than the Swedish studies. Lindo (2011), Schaller and Zerpa (2019), Page et al. (2019) all find negative effects of parental job-loss on the health of North American children, and Oreopoulos et al. (2008) and Page et al. (2019) find that the negative consequences of parental job-loss persist into young adulthood.

One explanation for this may be that the effects on the family's disposable income in the Swedish context are comparatively limited, which can be explained by generous unemployment insurance. Another possible explanation is that access to childcare, school and healthcare is unaffected by parental job and income loss.

We now tie the development of parental unemployment and social assistance during the COVID-19 to the presented evidence from previous studies. Based on previous findings, there is a risk that increased unemployment among parents of small children, and in particular mothers of small children, will have negative consequences for the health of children. If we believe that increased unemployment also leads to increased financial distress in some families, although this has not yet shown up in an increased use of social assistance, there are reasons to monitor the development of mental health of affected children. Given the previous research results, there is less reason to worry that the labour market consequences we have seen so far will have adverse consequences for children’s school performance since unemployment has not risen among the parents of older children. However, we cannot preclude that extended periods on short time work schemes, with the reduction in earnings that follow, and parental

[26] This effect size of approximately 5 percent of a standard deviation can be compared to the Swedish gender gap in compulsory school grades of 0.35 of a standard deviation to the advantage of girl. Chapter 3 summarizes research showing that one year in school increases student performance by 0.15–0.25 of a standard deviation.

stress connected to increasing risk of lay-offs as the pandemic continues may resemble a situation of parental job-loss and thus have negative effects on the family environment in ways that affect also older children. Nevertheless, as the increase in unemployment among parents of small children is limited to a few percentage points, we do not expect significant average effects on child health or school performance as a result of the impact of the first year of the COVID-19 pandemic on parents' labour market outcomes and families' financial vulnerability, although individual children have been negatively affected.

## 2.5 Concluding discussion

The number of children, youth and parents who have become seriously ill or died from COVID-19 is limited. For most children and youth, the effects of the pandemic are therefore indirect, resulting from changes in the home and school environment as well as parents' labour market situation.

So far, there is no clear evidence that the children born during the pandemic have been adversely affected by illness or stress. Increases in the number of calls to BRIS and women's shelters, as well as an increase in filings for divorce during the spring of 2020 suggest that the COVID-19 pandemic negatively affected the environment in which children grow up, causing stress, anxiety and conflict.

Unemployment among parents of young children increased during the first nine months of the pandemic, while parents of school-age children were unaffected. This may reflect that short time work schemes aimed to support employment were effective in doing so for older workers with permanent employment, while younger workers who are more often on fixed-term or hourly contracts or employed in the hospitality industry were less protected by these measures.

Despite rising unemployment in 2020, there was no increase in the number of children living in families receiving social assistance. Instead, this group declined, possibly because unemployment insurance coverage was extended to previously ineligible workers with weak labour market attachment. There is still reason to believe that families exposed to unemployment or prolonged short time work schemes may have suffered income losses and that some experience financial distress which may adversely affect their children. It is important to recognize that small changes in average figures conceal that affected children are more likely to come from already vulnerable environments. For these children, parental unemployment, income loss and financial strain has a greater risk of adversely affecting health, schooling and human capital development. However, previous research shows that well-functioning welfare institutions can protect children by helping to maintain a functioning day-to-day life, offering support

and protecting families from financial vulnerability and poverty.

Against this background, there is every reason to continue to have a child-focused perspective in the design of recommendations and policies aimed at the COVID-19 pandemic's direct and indirect consequences for Swedish families.

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# 3 School absenteeism during the COVID-19 pandemic – how will student performance be affected?

**Björn Öckert**

Unlike many other countries, the Swedish government decided to keep preschools and compulsory schools open when the country was hit by the coronavirus pandemic in the spring of 2020 (UNESCO 2020).[27] However, this does not mean that schools have been unaffected by the pandemic. The increasing prevalence of the virus and growing concern about infection – together with the Public Health Agency's (Folkhälsomyndigheten) recommendations to stay at home in the event of cold symptoms (Public Health Agency for Sweden 2020) – contributed to increased absenteeism among children, students and teachers in the spring of 2020 (National Agency for Education 2020a; b). However, it is unclear how much preschools and schools have been affected, since there are no national statistics on school absenteeism in Sweden.

The purpose of this chapter is to assess how the COVID-19 pandemic in Sweden may have affected preschool children's development and students' school performance. However, it is difficult – and perhaps a little premature – to isolate the effects of the pandemic on children's and students' performance. Instead, I will therefore use different sources to estimate how much absenteeism in preschool and compulsory school has changed during the initial phase of the pandemic (March–December 2020), and summarize previous research on the effects of attendance and absenteeism in preschool and compulsory school. I will subsequently assess how increased absenteeism during the COVID-19 pandemic can be expected to affect individuals as well as society at large.

The chapter will commence with a description of how absenteeism in preschool and compulsory school in Sweden has changed during the pandemic.[28] In addition, I will discuss how schools have arranged the instruction in the event of absent teaching staff, and the opportunities for distance education for absent

[27] In Sweden, only a few compulsory schools decided to completely close down in the spring of 2020 (Skolvärlden 2020).

[28] The chapter is limited to absenteeism among children, students and teachers in preschool and compulsory school, as upper-secondary schools, adult education and universities to a greater extent transitioned to distance education during the spring of 2020 (see chapter 4).

students. Thereafter, I will summarize the empirical evidence on how much students learn in school and the consequences of student absenteeism. Since absent preschool children and students can also influence class size in preschool and school, a review follows on the effects of class size. This is followed by a discussion about the research on how teacher absenteeism affects student performance. Based on previous research, an assessment will be made of the possible consequences of increased absenteeism during the COVID-19 pandemic. In the last section, I will summarize and discuss the results.

## 3.1 School absenteeism during the pandemic

Absenteeism in preschool and compulsory school during the COVID-19 pandemic in Sweden has probably been affected by several factors. Of course, some individuals contracted COVID-19, although it is difficult to determine exactly how many. The Public Health Agency's recommendations to stay at home if you were experiencing even the slightest cold symptoms (as of March 13, 2020) have probably also been of considerable significance in terms of absenteeism. Furthermore, some parents chose to keep their children at home during certain periods to avoid infection (Swedish Schools Inspectorate 2020).

There are no national statistics on absenteeism among staff, preschool children, and students in compulsory school in Sweden. To document how absenteeism in schools has changed during the pandemic, I have therefore used different sources. I have tried to use high-frequency data, which are regularly updated and can represent the entire country. To assess the pandemic's impact on absenteeism in preschool and compulsory school, the development in 2020 has been compared to the corresponding situation in 2019.

### 3.1.1 Absenteeism among preschool children and school students

*Preschool*

I use data on temporary parental benefits (TPB) from the Social Insurance Agency (Försäkringskassan) to measure children's absenteeism from preschool (Social Insurance Agency 2020). In Sweden, parents who stay home from work to take care of a sick child are entitled to receive temporary parental benefits, provided that the child is between 8 months and 11 years old. Since April 25, 2020, it is also possible to receive compensation if a preschool or school is closed due to COVID-19. To receive compensation for periods of illness that exceed seven days, a doctor's certificate is normally required but during the period from March 19, 2020 to November 1, 2020, this rule did not apply.

The Social Insurance Agency reports both applications for and payments of TPB. I chose to use information about applications rather than payments because

the statistics are reported weekly and updated continuously. The drawback is that the number of days of absence and the child's age are not specified. Usually, however, the application is made in close connection to the child's period of illness, even if there is a certain lag.[29] I convert the application data into net days by multiplying by the number of paid net days per application for different months and years. The number of net days for children of preschool age is calculated by multiplying it by the proportion of paid net days that refer to children aged 1–5 years for different months and years. Thereafter, the net days were divided by the number of children in the age group and the number of weekdays.

Hall and Lindahl (2016) show that the use of temporary parental benefit greatly underestimates children's absence due to illness in preschool.[30] They have information on both actual absenteeism in preschool and TPB for all preschool children in four municipalities during the 2005–2012 period. Actual absence due to illness in preschool turns out to be on average three times as high as the use of TPB. Even though the number of sick days vary greatly depending on the children's age and the season, the relationship between actual absenteeism and the use of TPB was in principle constant. I therefore choose to multiply the applications for TPB by a factor of three so that the information better reflects children's actual absence from preschool.

Figure 8 shows estimated absenteeism per week among children in preschool in 2019 and 2020. Absenteeism in preschool is usually approximately 7–10 percentage points in Sweden, with a distinct peak in the month of February. At the beginning of 2020, absenteeism in preschool was similar to the 2019 level, even though absence due to illness was actually slightly lower in 2020. In connection with the increasing spread of the COVID-19 infection, the Public Health Agency's recommendations to stay at home in the event of cold symptoms, and increasing concern about the infection, absenteeism in preschool increased sharply during the month of March 2020. At its peak, it amounted to just over 20 percentage points. However, the increase was relatively short-lived and as early as in April, absenteeism returned to somewhat more normal levels, albeit a few percentage points higher than the previous year.

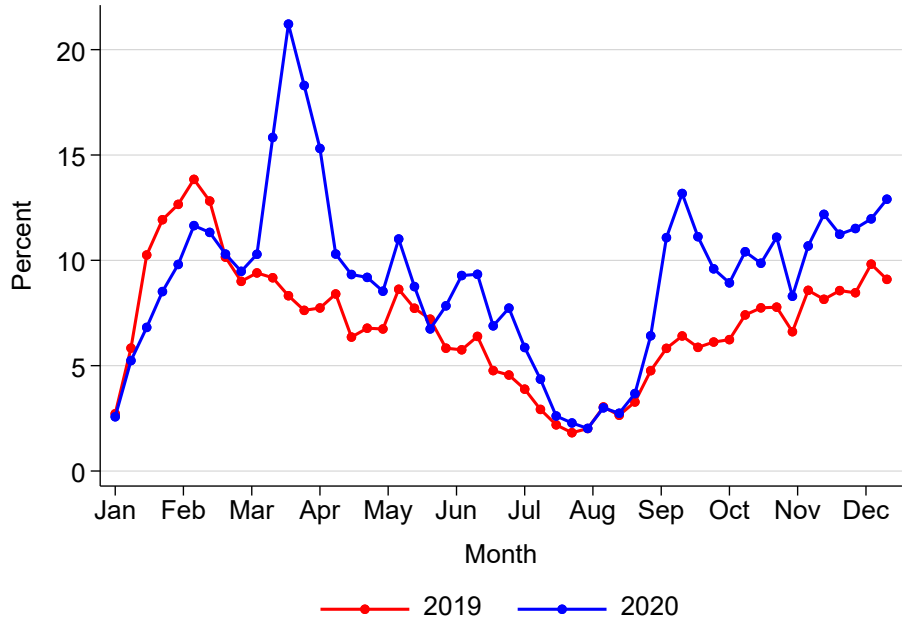
During the summer months, the level of preschool attendance is usually low, which results in lower absenteeism. When children returned to preschool after

[29] Parents can apply for compensation no later than within 90 days after the first day of illness.
[30] The underestimation is mainly due to the fact that parents do not always apply for compensation, even though their children have been absent from preschool. Perhaps it is possible for them to work from home or to make alternative childcare arrangements. The propensity for parents to apply for compensation may have decreased during the pandemic, as more and more people are working from home. In that case, my figures may underestimate the absenteeism among preschool children.

the summer holidays in 2020, absenteeism increased significantly, only to then fall again. However, absenteeism has been significantly higher than normal throughout the autumn of 2020. Overall, my estimates indicate that absenteeism among preschool children increased by more than 4 percentage points during the spring term 2020. During the autumn term, absenteeism was just over 3 percentage points higher than the previous year. Seen over the period from March–December, absenteeism among Swedish preschool children increased by approximately 50 percent (just over 3.5 percentage points).[31] The increasing absenteeism is slightly higher for 1–3-year-olds than for older children, which is also normal (not shown in the figure). However, there is no information about how absenteeism has affected children with different social or ethnic backgrounds.

[31] The figure only refers to the weeks during which children normally attend preschool.

**Figure 8** Estimated absenteeism among preschool children in 2019 and 2020




*Source:* Calculations based on the Social Insurance Agency's data on applications for temporary parental benefit per week for the years 2019–20. The number of net days per application is calculated by multiplying it by the average number of net days paid per application for different months and years. The number of net days for 1–5-year-olds is calculated by multiplying it by the proportion of paid days that pertaining to 1–5-year-olds for different months and years. The net days are then divided by the number of children in the age group and the number of weekdays. In order to take into account that the use of temporary parental benefit underestimates preschool children's actual absence due to illness, the data have been multiplied by a factor of 3 (Hall and Lindahl 2016).

*Compulsory school*

I use information from Skola24 to describe absenteeism among students in compulsory school during the pandemic in Sweden (Skola24 2020). Skola24 provides an administrative system for compulsory and upper-secondary schools, making it possible to manage scheduling, allocate teachers and report student absence. Teachers can register students who are absent from lessons, while parents can report their children's absence from school via computer, phone, or mobile app. I only have access to absence reporting carried out by parents (or students over the age of 18) by phone. Absence reporting in Skola24 is used by many school organizers and comprises about 380,000 students – or just over 35 percent of the country's students – of which about 75 percent are in compulsory school and 25 percent in upper-secondary school. Even if the information from

Skola24 is not comprehensive, I still believe that it is representative of the entire country, as it includes both municipal and independent schools of varying sizes in different parts of the country.

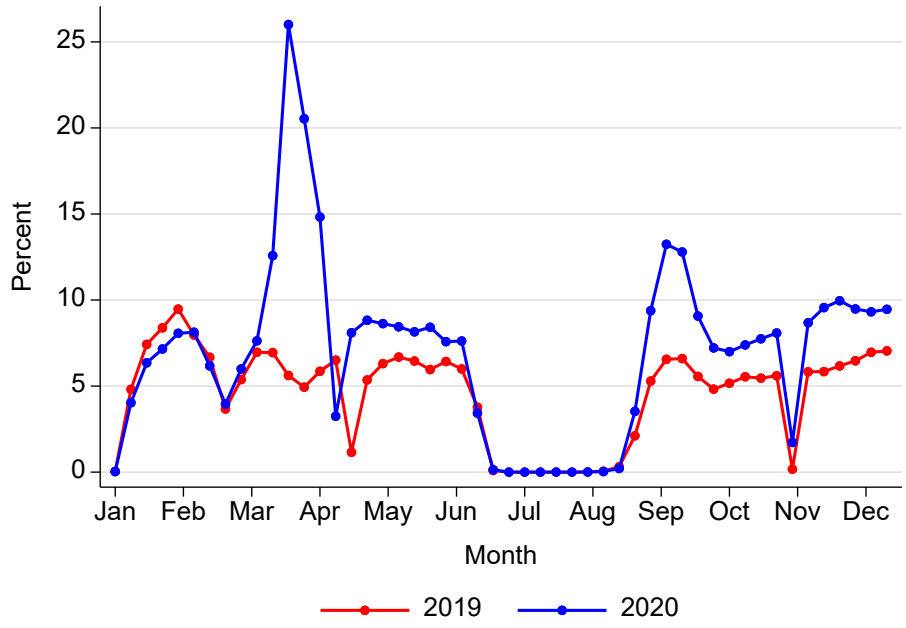
Skola24 reports the number of students per day (full-time equivalents) who report absent by phone in compulsory school and upper-secondary school for the academic years 2018/19, 2019/20 and 2020/21. Skola24 estimates that about half of all reports of absenteeism from parents and legal guardians are made by phone. On top of that, absenteeism is also registered by teachers. Actual student absenteeism should thus be at least twice as high as notification of absence by phone. The National Agency for Education's surveys show that absenteeism in schools before the pandemic (2019) was more than 3 times as high in the sampled municipalities as the absenteeism data from Skola24 (National Agency for Education 2020a; b). I have therefore decided to correct the information from Skola24 by multiplying it by a factor of 2.5, which should be a relatively conservative estimate of the level of absenteeism. I then calculate the proportion of absent students in compulsory school by dividing the number of days of absence by the number of students and days, and adjusting the values by the proportion of absenteeism that usually applies to compulsory schools (National Agency for Education 2020a; b). I subsequently calculate the average absenteeism per week (weekdays only) for the years 2019 and 2020.

Figure 9 shows the estimated absenteeism in compulsory school for the years 2019 and 2020. Absenteeism in compulsory school is usually around 6 percent, with significantly lower levels during the school holidays. The beginning of 2020 did not differ much from the previous year; if anything, absenteeism was a little lower. Just as in preschool, however, absenteeism increased sharply in connection with the increased spread of infection, increasing anxiety and new recommendations from the Public Health Agency during the month of March. At its peak, absenteeism in compulsory school was over 25 percent. However, the increase was temporary and during the latter part of the 2020 spring term, absenteeism returned to more normal levels, albeit one or a few percentage points higher than the previous year.

At the start of the school term, student absenteeism increased significantly again, peaking at over 13 percent in September 2020, only to then fall again. During the rest of the autumn term, however, absenteeism has been higher than normal. Overall, the estimates indicate that student absenteeism in compulsory school increased by an average of just over 5 percentage points in March–June 2020. During the autumn term of 2020, absenteeism was approximately 3 percentage points higher than in 2019. Seen over the period from March–December, student absenteeism in compulsory school in Sweden increased by

approximately 70 percent (just over 4 percentage points) compared to 2019. Absenteeism among students in compulsory school during the COVID-19 pandemic has thus developed in a similar way to that of preschool children.[32]

**Figure 9** Estimated absenteeism among students in compulsory school in 2019 and 2020




*Source:* Calculations of data from Skola24 on student absenteeism in compulsory and upper-secondary school, reported by phone during the academic years 2018/19–2020/21. To account for the under-reporting of absence notification by phone, I multiply the data by a factor of 2.5. The proportion of absent students in compulsory school has been calculated by dividing the number of days of absence by the number of students, and adjusting it by the proportion of absenteeism which typically applies to compulsory school (National Agency for Education 2020a; b). I subsequently calculate the average absenteeism per week (weekdays only).

Although the fraction of absent preschool children and school students has increased significantly during the COVID-19 pandemic, it is more difficult to decide how the absenteeism was distributed across different groups of students or grade levels. Usually, the share of absent students is higher in lower-secondary

[32] Reported absenteeism in upper-secondary school decreased with the transition to distance education in the spring of 2020 (National Agency of Education 2020a; b). The increased absenteeism in compulsory school during the autumn of 2020 can, however, be assumed to also be representative of the situation in upper-secondary school, since teaching has mainly been conducted on site.

school than in primary school (Öhman 2016), but it is possible that the increased absenteeism in 2020 was more evenly distributed. A majority of the school organizers surveyed by the National Agency for Education believe that the pandemic to some extent affected absenteeism in compulsory school more for certain groups of students than for others (National Agency for Education 2020b), especially students whose parents have a lower level of education or foreign background, and live in disadvantaged areas (SVT Nyheter 2020). There are also significant regional differences in student absenteeism. In Stockholm city's compulsory schools, for example, 32 percent of students were absent at the beginning of March 2020 (Arbetsvärlden 2020).

### 3.1.2 Absenteeism among staff and teachers

I use information from Previa to describe the absenteeism among staff and teachers during the COVID-19 pandemic in Sweden (Previa 2020). Previa handles absenteeism reporting for 156,000 workers at 410 private and public organisations throughout Sweden. The advantage of using information from Previa is that it refers to both short-term and long-term absence due to illness, is reported weekly and is updated continuously. Previa has made aggregate absenteeism data available for eight municipal education administrations, which I use to estimate absenteeism among preschool and compulsory school staff.[33] In addition to preschool and compulsory school, the education administrations also include upper-secondary school and some school management. I used monthly data on staff absenteeism in compulsory and upper-secondary school in Stockholm city to adjust the statistics so they better represented staff absenteeism in preschool and compulsory school.[34] I report the total absenteeism per week regardless of the reason for the absence – which also includes caring for sick children – to describe how the staff and teacher attendance in preschool and compulsory school was affected by the pandemic overall.

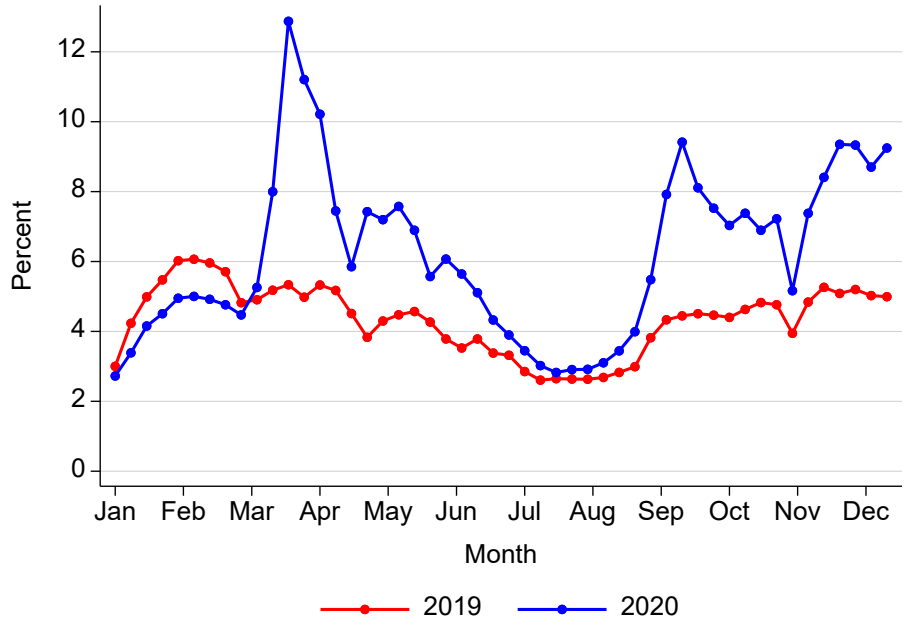
Figure 10 shows that staff absenteeism in preschool and compulsory school is normally around 4 percent, with slightly lower absenteeism during the summer break. At the beginning of 2020, the share of employees who were absent from

[33] It is difficult to assess the representativeness of the municipalities covered by the data. They do, however, have roughly the same level of monthly usage of temporary parental benefit as the entire country's municipalities in 2019–2020, which indicates that absence due to illness during the pandemic for the municipalities in the sample largely follows the same pattern as for the country as a whole.

[34] I adjust the absenteeism data from the education administrations with the ratio between absenteeism in compulsory school and the weighted average of absenteeism in compulsory and upper-secondary school in Stockholm city for different years and months. Absenteeism among staff in compulsory school in Stockholm city is weighted so that it represents absenteeism among staff in both preschool and compulsory school.

their workplace was at about the same level as the year before. In connection with the Public Health Agency of Sweden making recommendations more rigorous, as well as a general increase in prevalence of the virus and growing concern about infection, absenteeism in preschool and compulsory school increased sharply during the month of March. At its highest level, just under 13 percent of the staff were absent. The increase in reported absenteeism was relatively short-lived and the share of employees who stayed at home then fell to approximately 7 percent in April and May, which was slightly higher than the previous year, however.

**Figure 10** Estimated absenteeism among staff in preschool and compulsory school in 2019 and 2020




*Source:* Calculations based on Previa's data on reported absenteeism in eight municipal education administrations 2019-2020. Monthly absenteeism data for compulsory and upper-secondary schools in Stockholm city have been used to adjust the total absenteeism so that it better represents the situation in preschool and compulsory school.

At the start of the school term, absenteeism among staff increased sharply, and then remained at approximately 3 percentage points higher than usual for the rest of the autumn of 2020. Seen over the period from March–December 2020, absenteeism in preschool and compulsory school increased by almost 70 percent (just over 3 percentage points). The absenteeism among school staff during the

pandemic thus follows the absenteeism among preschool children and school students, with sharply rising absenteeism during March 2020. Subsequently, there was a return to more normal – albeit slightly elevated – levels during the end of the spring term. At the start of the school term in the autumn of 2020, absenteeism among school staff increased significantly again, and up to and including December absenteeism has been significantly higher than in 2019.

### 3.1.3 How are preschools and schools affected by increased absenteeism?

The consequences of increased absenteeism among staff and students depend to a large extent on how the schools handle the situation. The schools can respond to increased staff absenteeism in various ways: other teachers can take over teaching duties from absent colleagues, the schools can hire substitute teachers, or they can let absent teachers handle their teaching duties from home (remotely). Of course, there is also a considerable risk that students will not receive any teaching at all. How absent students are handled can also differ: teachers can give homework to students who are absent, students can be given special distance education, or they may follow the regular teaching at a distance. In most cases, the students will probably not receive any teaching at all. In practice, the schools' handling of increased absenteeism depends on the teachers' workload, availability of substitute teachers, technical circumstances, and the state of health of absent teachers and students.

In April and May 2020, the National Union of Teachers (Lärarnas Riksförbund) and the Swedish Teachers' Union (Lärarförbundet) conducted surveys among a sample of their members concerning how teaching was being conducted during the initial phase of the COVID-19 pandemic (Lärarförbundet 2020; Lärarnas riksförbund 2020). Both surveys show that a majority of teachers in preschool and compulsory school felt that their workload had increased since the pandemic began. The teachers stated that they were forced to cover for absent colleagues and that more absent students had led to extra work.

About half of the compulsory schoolteachers had the opinion that they had to teach more because colleagues were absent due to illness, and 20–25 percent had taught a group of students that they usually did not teach. How often substitute teachers were employed to replace staff who were absent is not clear from the surveys. In some places, however, a lack of access to substitute teachers seems to be perceived as a major problem (Wiklund 2020). At the same time, the temporary employment agency sector believes that the demand for substitute teachers fell sharply in March and April 2020 (Olby Kimondo and Astner 2020). Possibly the different perceptions are due to differences in the need for substitute

teachers over time or across regions, formal requirements for substitute teachers and the willingness to hire substitute teachers. Overall, the teaching during teacher absenteeism often seems to have been handled by colleagues, while it is more difficult to assess how often substitute teachers have been hired or lessons have been cancelled.

The surveys also show that teaching in Swedish compulsory schools during the initial phase of the COVID-19 pandemic was usually carried out on site. Approximately 10 percent of the teachers have had separate distance education with absent students or offered distance education in parallel with regular teaching. About 30 percent of the teachers stated that they had recorded lessons for absent students, while 60 percent had given specific tasks to absent students. However, it is difficult, based on the surveys, to assess the proportion of absent students who have been able to benefit from all or part of the teaching when they were at home.

## 3.2 What does research tell us about the effects of student absenteeism?

How much student performance is affected by increased absenteeism depends both on how much they usually learn in school (and, thus, how much they miss), and how much they learn when they are absent. As it has proved very difficult to establish credible causal links between student absenteeism and school results, I will initially go through the research on how much students usually learn in school. Subsequently, studies that more directly study the consequences of absenteeism will be reviewed. I have only considered studies that have a reasonable strategy for identifying causal effects. Greater emphasis has been given to studies that refer to Swedish schools or countries with school systems that are similar to Sweden's. Previous research mainly focuses on students' school results, but in some cases I will also say something about the more long-term effects.

### 3.2.1 How much do students learn in school?

There is an extensive literature that attempts to measure how much students learn in school. The empirical challenges in establishing credible causal relationships between time in school and different outcomes depend on the age group being studied. For school-aged children, it is difficult to determine how much of the difference in results between students in different grade levels that are due to differences in time spent in school, and what can be attributed to differences in age. For adults, the challenge is to assess how much of the differences in skills

that are due to differences in schooling, and what can be explained by the fact that individuals who go to school longer differ also in other ways.

*Studies that use school starting age rules*

A large body of literature exploits the rules for when children start school to disentangle the effects of schooling and age. In most countries, children must reach a certain age at a given date before they are allowed to start school. This means that children born just before the school starting age cut-off point (usually January 1) may start school one year earlier than children born just after the same date. It is thus possible to measure the effect of one year of schooling by comparing students born just before and just after the cut-off point; they are about the same age but have been in school for different lengths of time.[35]

Studies that use school starting age rules to estimate the effect of schooling are usually based on tests completed by students in two subsequent grade levels at the same point in time (for early contributions see Baltes and Reinert 1969; Cahan and Davis 1987; Cahan and Cohen 1989). The differences in test scores for children in the same grade level, but who are born at different times of the year, is attributed to the effect of age, while the differences in results for children in different grade levels, and who are just before or just after the cut-off point, is attributed to the effect of instructional time. Since parents, teachers and school administrators have some opportunity to advance or delay when children start school, some studies use the date of birth (usually the quarter of birth) as an instrument for years of schooling (Neal and Johnson 1996; Hansen et al. 2004; Cascio and Lewis 2006).

There are several studies that use this approach to measure how much children learn in Swedish schools. Gustafsson (2009) studies the literacy test in PIRLS 2001 to measure the effect of attending grade 4 in relation to grade 3. He finds that one year in compulsory school improves reading comprehension by 0.26 standard deviations (SD).[36] Cliffordson (2010) and Cliffordson and Gustafsson (2010) use TIMSS 1995 to estimate the effect of attending grade 7

[35] Studies that use school staring age rules to measure the effects of time spent in school are based on the assumption that the age at school start and relative age in the class do not affect educational outcomes. However, there is significant evidence that children who are older when they start school outperform their younger peers (e.g. Bedard and Dhuey 2006; Fredriksson and Öckert 2005). Although some of the effects may be due to differences in age at the time of testing, the effects of age at school start persist later in life (Fredriksson och Öckert 2014). It is thus likely that studies that identify the effects of time spent in school by school starting age legislations underestimate how much children learn in school.

[36] Since test scores do not follow a natural scale, effect sizes are usually stated in terms of standard deviations (SD) of the test score distribution. For comparison, 1 standard deviation in the grade distribution in grade 9 corresponds to a merit rating of approximately 75.

and grade 8, respectively. They found that one year in grade 7 improves test scores by 0.33–0.36 SD in mathematics and 0.40 SD in science, while the effect for attending grade 8 amounted to 0.14–0.25 SD in mathematics and 0.07 SD in science.

Webbink and Gerritsen (2013) study the effect of one year of schooling on the results in mathematics and science in TIMSS 1995. They examine the effects in a number of countries – including Sweden – and for different age groups (grade 4 and 8). On average, one school year improved results by 0.2–0.3 SD in grade 4 and by 0.1–0.2 SD in grade 8. For Sweden – which only participated in TIMSS in 1995 with the older age group – one school year in grade 8 improved results by approximately 0.2 SD. Luyten et al. (2017) also find that the effects of schooling for student learning is greatest in the lower grade levels, and then declines gradually. In accordance with these results, Gormley Jr. and Gayer (2005) and Leuven et al. (2010) show that preschools and early schooling have major effects on children's learning, especially for children from low socioeconomic backgrounds.

*Studies that use school holidays*

Studies that use school holidays to measure the effect of instructional time compare how much students learn when they go to school with their learning during school holidays. There is overwhelming evidence that students learn less – or even forget what they have learned – during the summer break (Entwisle et al. 1997; Heyns 1978; Quinn et al. 2016). However, there is no consensus in the literature regarding the extent of the 'summer learning loss', or whether it affects students from weaker family backgrounds more than other students (Dumont and Ready 2020; Hippel and Hamrock 2019).

Lindahl (2001) uses the difference in learnings during the school year and the summer holidays, respectively, to measure the effects of instructional time for students in grade 6 in Sweden. He collected test scores and survey information for 556 students in 16 randomly selected Stockholm schools. The students were given the same test in mathematics at the end of the spring term in grade 5, at the beginning of the autumn term in grade 6, and at the end of the spring term in grade 6. The difference in learning during the school year and during the summer holidays corresponded to a schooling effect of approximately 0.21 SD. However, he finds no differences in learning between students from different backgrounds.

Carlsson et al. (2015) use the enrolment test for military enlistment to measure the effects of academic upper-secondary school education on students' cognitive abilities. Due to capacity constraints and logistical considerations, the enlistment date varies, even for men born in the same month in the same parish.

This means that those who were called up late in the year have spent more time in upper-secondary school than those who were called up earlier. To separate the effect of education from the effect of age, the authors use school holidays. The results show that one year in upper-secondary school improves students' word comprehension and technical comprehension by 0.18 SD, while it does not seem to affect spatial or logical-inductive ability. They find no significant differences of time spent in upper-secondary school for students with different compulsory school grades or family backgrounds.[37]

*Studies that use temporary school closures*

A number of studies examine how much students learn in school by using schools that temporarily shut down due to bad weather or teacher strikes. The effects of time spent in school are measured by comparing the results in schools that are forced to close with schools that remain open. Marcotte (2007), Marcotte and Hemelt (2008), Hansen (2011) and Goodman (2014) study how school closures due to snowstorms affect student performance. A common feature of these studies is that the measured loss of knowledge during school closures is considerable, often more than ten times as great as studies that use school start rules or school holidays. This indicates that bad weather probably disrupts school activities in more ways than excluding students from school.[38]

Schooling may also need to be suspended during teacher strikes. Baker (2013) uses differences between cohorts to study the effects of teacher strikes in Canada, and find that school strikes seriously impair school performance in grade 6. Belot and Webbink (2010) compare differences in school attendance between the French-speaking parts of Belgium, that were affected by extensive teacher strikes, and other conflict-free regions, and show that strikes have major consequences for the proportion of students who have to repeat a grade. Jaume and Willén (2019) use differences in teacher strikes between regions and cohorts in Argentina and find that students affected by the strikes had a slightly lower level of education and income as adults.

[37] Cliffordson and Gustafsson (2008) also use differences in when men were called up to the enlistment, but they do not take into account that the date of enlistment depend on the men's month of birth, parish and upper-secondary school programme. Fitzpatrick et al. (2011) use randomness in the point in time when students take tests, but they do not take differences in age into account.

[38] A related literature studies the consequences of natural disasters that force students to switch schools. However, the results probably capture not only the effects of instruction time, but also the consequences of traumatic experiences and having to switch schools (see e.g. Sacerdote 2012).

*Studies that use school reforms*

Various reforms of the school system can be used to measure the effects of time in school. Research on school reforms is primarily focused on examining the long-term consequences of instructional time. National school reforms can be evaluated by comparing the first cohorts to be subjected to a reform with earlier cohorts, which are unaffected. However, there is a risk that such comparisons will also capture general time trends in the outcomes studied. School reforms that are instead introduced gradually in different schools, municipalities or regions can be evaluated by comparing the change in different outcomes for the students subjected to the reform with the development for those who were not (yet) affected. It is thus possible to take into account both average differences between schools, municipalities or regions and general time trends.[39]

Several studies use extensions of the compulsory school leaving age to measure the income effects of schooling. The results are very mixed. Some studies find substantial income effects from compulsory schooling (Harmon and Walker 1995; Oreopoulos 2006), which to some extent has been questioned (Devereux and Hart 2010). Other studies find little or no effects of another year in compulsory school (Grenet 2013; Pischke and von Wachter 2008). Fischer et al. (2019) study the introduction of a seventh school year in compulsory schools in Sweden during the 1930s and 1940s and show that another school year increased income by about 2.5 per cent. The effects were greater for women and those from weaker family backgrounds.

The instructional time in schools can be affected not only by postponing the compulsory school leaving age but also by extending the school year. Several studies use reforms of the length of the school year to examine the effect of time in school. Pischke (2007) studies a significant extension of the school year in West Germany in the late 1960s and finds that students had a lower risk of having to repeat a year. However, the effects on income were very small. Parinduri (2014) studies a similar reform in Indonesia in the 1970s by comparing individuals born just before and after the extension of the school year, respectively. A longer school year led to higher educational participation and significant increases in income.

Fischer et al. (2019) study an extension of the school year in Sweden during the 1940s and 50s. The longer school terms were introduced gradually in different municipalities and the effects are measured by comparing the change in educational attainment and income for individuals in municipalities that chose to extend the school year at an early stage with those in municipalities that

[39] Another condition for being able to use school reforms to measure the effects of length of schooling is that they do not also change the content or quality of education.

introduced the reform later. The results show that students who received more instructional time had higher incomes as adults. Earnings primarily increased for women, possibly due to increased labour supply.

Some school reforms affect the length of education as well as other aspects of the school system, which make it more difficult to separate the mechanisms behind the effects. However, they can still provide some information about the significance of time in school. Meghir and Palme (2005) study the effects of the introduction of nine-year compulsory school – which replaced the parallel school system – in different municipalities in the period 1949–62. The effect of the reform was evaluated by comparing the difference in outcomes for municipalities that introduced the reform at different points in time. The results show that students who attended the new compulsory school received longer education and slightly higher income. This applied particularly to individuals with low-educated parents.[40]

Hall (2012) evaluates a pilot project with longer upper-secondary vocational programmes, with greater theoretical content, during the period 1988–93. The reform was evaluated by comparing changes in outcomes for students in municipalities that decided to extend vocational programmes with municipalities that chose not to do so. The extension of the vocational programmes meant that more students completed three years of upper-secondary education. At the same time, the share of students who dropped out of upper-secondary school increased, entirely driven by students who had low grades in compulsory school. The income effects of the longer vocational programmes were very modest.

The expansion of subsidized childcare has been used in several studies to examine the effects of attending preschool (see the reviews by Raudenbush and Eschmann 2015, and Dietrichson et al. 2020). (Havnes and Mogstad 2011, 2015) study the expansion of the preschool system in Norway in the 1970s and find major effects on educational attainment and earnings, especially for girls and children from low-income families. Drange and Telle (2017) study the effects of free childcare for foreign-born children in Oslo and find that in areas with increased access to childcare, girls in particular received higher grades in compulsory school.

Drange and Havnes (2019) exploit random allocation of preschool places for 1–2-year-olds in Oslo, and find that children who were given the opportunity to start preschool earlier had language skills that were 0.16 SD higher and mathematics results that were 0.11 SD better than their peers when they started school. This implies that spending one year in preschool improves language skills by 0.60 SD and mathematics performance by 0.36 SD. The positive effects

[40] See (Holmlund 2020) for a review of the research on the Swedish compulsory schooling reform.

were greatest for children whose parents had a low level of education. Liu and Skans (2010) evaluate the effect of extended parental leave in Sweden – where children would otherwise normally go to preschool – but found no effects on average. However, children of highly educated parents benefited from staying at home longer with their parents.

All in all, there is overwhelming evidence that time in school affects students' learning and life chances. One year spent in school improves performance by about 0.2–0.3 SD. The effects are greatest at the start of schooling and then decrease, but there is also significant learning in secondary school. Research also shows that preschool has significant positive effects on children's development, perhaps as much as 0.4–0.6 SD per year. Especially children from weak socioeconomic backgrounds benefit from going to preschool. The effects of time in compulsory school also persist later in life, and one year spent in school increases income by about 2–3 percent. Another conclusion from the literature is that the labour market return to skills seems to amount to about 10 percent (0.025/0.25), which can be used to assess future income effects of various school interventions.

### 3.2.2 What does research tell us about the effects of student absenteeism?

Studies that directly attempt to estimate the effects of staying home from school should reasonably be most relevant in assessing the consequences of increased student absenteeism during the COVID-19 pandemic. However, it has proved challenging to identify causal effects of student absenteeism because it is often due to factors that are hard to observe by the researcher. The share of students who stay home from school, for example, is larger among students from lower socioeconomic backgrounds or who are low-performing (Hancock et al. 2013; Jacob and Lovett 2017). It is therefore difficult to determine how much of the differences in school results that have been caused by higher absenteeism rates and what is due to other student characteristics.

Several studies attempt to account for differences between students who are away from school to a varying degree, by studying changes in student absenteeism over time, or by comparing absenteeism between siblings from the same family (Aucejo and Romano 2016; Gershenson et al. 2017; Gottfried 2009, 2011).[41] However, the estimated effects of student absenteeism on performance are often very large. Furthermore, it is primarily unexcused absenteeism that has

[41] Aucejo and Romano (2016) use regional differences in influenza outbreaks as an instrument for absenteeism and found approximately the same magnitude of the negative effects from student absenteeism as when they studied changes in absenteeism over time.

significant adverse consequences, despite the fact that the amount of teaching missed should not differ between excused and unexcused absenteeism. This suggests that the differences in absenteeism probably do not only capture how much teaching students miss out on, but also other differences between students who are away from school to varying degrees.

Cattan et al. (2017) study the short and long-term effects of absenteeism in grades 1 and 4 in Sweden in the 1930s. They account for differences between students with different levels of absenteeism by analysing changes in students' absenteeism over time, differences in absenteeism between siblings from the same family, and differences between students from the same school or with the same teacher[42]. However, the results are relatively insensitive to how they attempt to deal with differences between students with different absenteeism rates. They find that an absence of ten days impaired school results by about 0.035 SD, which corresponds to about 0.6 SD per school year. On the other hand, the negative consequences of absenteeism seem to disappear over time, and there are very limited effects of absenteeism on educational attainment and earnings later in life.

Liu et al. (2019) use differences in absenteeism for the same student in different subjects to account for time-varying differences between students whose absenteeism rates differ. However, the results are not greatly affected by how they chose to address differences between students with different levels of absenteeism. They find that students who were absent for 10 lessons performed 0.07 SD lower in mathematics and English. The consequences of absenteeism in secondary and upper-secondary school were relatively similar. Furthermore, the negative effects seem to persist later in life. Upper-secondary school students who were absent for ten mathematics lessons had 4 percentage points lower chance of going to university.

Some studies evaluate information initiatives to reduce student absenteeism, which can also provide insights about the consequences of absenteeism. Rogers and Feller (2018) study a large, randomized experiment in the US where different types of information about student absenteeism were sent to the students' parents. They find that information about student absenteeism significantly reduces student absenteeism. Absenteeism also decrease for siblings of students whose parents received information about the absenteeism. Bergman and Chan (2019) conducted a similar large-scale experiment in the US where information on student absenteeism was sent to parents. They show that absenteeism decreased by 12 percent for students who participated, and that the risk of having

[42] They also use regional and time variation in weather conditions as instruments for absenteeism, but the precision of the estimates is then significantly reduced.

to repeat a year was reduced. However, school results were not affected. Berlinski et al. (2016) study a small experiment where information about student absenteeism was sent to the parents. They find that attendance increased for students who had taken part, and that mathematics results had improved by 0.08 SD after four months.

In summary, there is reason to believe that studies which attempt to measure the direct effects of student absenteeism tend to overestimate the negative consequences of being home from school. There are probably many time-varying unobserved factors that affect if students are absent, which also affect school performance. However, the results from experiments where information on student absenteeism is sent to parents show that reduced absenteeism can improve the students' results, even if the existing research is too limited to be able to determine how large the effects are.

## 3.3 What does research tell us about reduced class size?

The review shows that the development of preschool children and school students is adversely affected by absenteeism in school. At the same time, increased absenteeism means that the size of preschool groups and school classes decreases, which can benefit the children and students who are in school. Although some of the negative consequences of increased student absenteeism can be mitigated by reduced class sizes, it also contributes to increasing the differences between children and students who are absent and those who are present. This section summarizes the literature on the importance of the size of preschool groups and school classes for the development of preschool children and students.

There is extensive research on how the number of students in a class (class size) affects school results. Significantly less is known about the effects of the size of the groups in preschool. The difficulty of measuring the effects of class size is due to the fact that schools, parents and students have influence over which schools and classes in which students are placed. In a compensatory school system, more resources are typically allocated to weaker students, which means that low-performing students more often attend schools with a higher teacher density and are placed in smaller classes. In school choice systems, parents can choose schools that have a higher teacher density and smaller class sizes. Because well-educated parents more commonly make active school choices, this can mean that high-achieving students more often attend schools with more teacher resources.

There are both experimental and quasi-experimental studies of class size. The most studied experiment of class size is the project STAR, which was carried out

in 79 schools in the US in the 1980s.[43] Children who started school in kindergarten at the age of five were randomly assigned either to a small class with 13–15 children or into larger classes with 22–25 children.[44] The teachers were then randomly assigned to different classes. In total, the experiment comprised about 330 classes and lasted for four years (from kindergarten to third grade). Thereafter, the students were placed in classes with a regular class size. Krueger (1999) shows that students who were in smaller classes had significantly better results in mathematics and reading than students in larger classes; one more student in the class reduced the results by approximately 0.03 SD. The effects were slightly stronger for students with lower socioeconomic backgrounds.

Krueger and Whitmore (2001) study the long-term effects of project STAR. They show that the positive effects of smaller classes on test scores faded out when students were placed in regular classes after the experiment ended in grade 4. At the end of grade 8, they found no significant differences in test scores between students who had been in smaller or larger classes from kindergarten to third grade.[45] One possible reason for why the effects on test scores do not persist is that schools later compensated students who were in smaller classes by allocating more teacher resources to them.

Krueger and Whitmore (2001), Finn et al. (2005) and Chetty et al. (2011) show that the positive short-term effects of project STAR re-emerge later in life. Students who were in a smaller class in primary school completed upper-secondary school to a greater extent, where more likely to take the SAT and started studying at university in somewhat greater numbers. They also had a lower risk of being arrested for a crime (Schanzenbach 2006). On the other hand, there were no differences in income at the age of 27, probably because they had not yet received the full return on their university studies.

There are some small-scale experiments with smaller teaching groups in preschools. Cederblad et al. (1976) conducted an early experiment with higher staff density in preschools in Stockholm in the 1970s. In ten different preschools, the children were randomly assigned either to groups with a high staff density (1 adult per 3 children) or regular staff density (1 adult per 5 children). After nine weeks, the treatment and control groups switched places – children who initially had been in a small group were placed in a regular group and vice versa – and the experiment continued for another nine weeks. The results show that children

[43] STAR stands for the Tennessee Student/Teacher Achievement Ratio experiment.
[44] Large classes were randomly allocated either 1 or 1/3 teaching assistant.
[45] The result is sometimes interpreted as meaning that class size only matters in the first few years. However, the study says nothing about in which grade level smaller classes have the largest effect, but rather that the effects of class size on test scores in Project STAR do not persist over time.

in small groups had more activities and more contact with each other. There were also signs that they were less aggressive. Francis and Barnett (2019) study an experiment with smaller groups of children in preschool in the US. Children and teachers were randomly assigned to small (15 children) or large groups of children (20 children). The experiment included a total of 42 groups in one school year. Children placed in small groups were slightly better at reading, but the researchers find no differences in their vocabulary or understanding of mathematics.

There are also a number of quasi-experimental studies of class size in schools. In many countries there are restrictions on how large classes can be, which can be used to estimate the effects of class size. The effects of class size are measured by comparing schools that have managed to fill all their classes, with schools that have about the same number of students, but that have opened up another classroom in order not to violate the maximum class size regulations. Provided that schools cannot exactly manipulate the number of students in the school, maximum class size rules can be used to identify the casual effects of being placed in a small class.

Angrist and Lavy (1999) use a maximum class size rule to measure the effects on study performance in grades 3–5 in Israel in the 1990s. They find that students who, due to the rule, attended schools with a lower average class size had better test scores in grades 4 and 5 (but not in grade 3); one more student in the class lowered the results by 0.02–0.04 SD. Fredriksson et al. (2013) use the same approach to estimate the effect of class size in Sweden in the 1980s and 1990s. They show that students who were in a small class in grades 4–6 had better results throughout school, spent longer time in education and had higher wages as adults; One more student in the class in upper primary school reduced performance by about 0.03–0.04 SD, decreased the number of years of schooling by 0.05 years and reduced wages by 0.6 percent. It is primarily students with low-educated parents who are adversely impacted by class size. Fredriksson et al. (2016) show that highly educated parents compensate if their children end up in a larger class by helping them more with homework. They also find that the benefits of class size reductions outweigh the costs.[46]

Lindahl (2005) measures the effect of class size by comparing learning during the school year with learning during the summer holidays in grade 6 in Sweden. Provided that learning during the summer holidays is not affected by class size,

[46] Many studies that exploit maximum class size rules find positive effects of smaller classes (see e.g. Angrist and Lavy 1999; Browning and Heinesen 2007; Fredriksson et al. 2013; Urquiola 2006)), but there are also studies that do not (see e.g. Hoxby 2000; Leuven et al. 2008; Leuven and Løkken 2018; Angrist et al. 2020).

it is possible to account for differences in both the level of and change in school results for students who are placed in classes of different sizes. He finds that one more student in the class reduced the results in mathematics by 0.015 SD. The effects were greatest for foreign-born students.

In summary, there is significant evidence that smaller classes in schools improve student performance. An increase of the class size by one student over 3–4 school years reduces the students' learning by 0.02–0.03 SD, which corresponds to an effect of around 0.005–0.01 SD per school year. The effects are often greater for low-achieving students. There is also evidence that class size effects persist and that those who were placed in smaller classes in school have higher wages as adults. The evidence on the effects of the size of preschool groups is more limited. A few experimental studies show that the staff density in preschools is important for child development, but it is difficult to know exactly how large the effects are. Together with the results from project STAR – which during the first year included five-year-olds – there is still much to suggest that smaller groups in preschool also have beneficial effects.

## 3.4 What does research tell us about the effects of teacher absenteeism?

How absent teachers affect student performance depends on how the schools handle the situation. They can try to hire substitute teachers or to let other teachers at the school cover for their absent colleagues. However, it can be difficult to find suitable replacements, especially if many teachers are absent at the same time. The risk is then that students will receive no teaching at all. Even if substitute teachers can be found, they usually have a limited amount of time to prepare, which probably affects the quality of the teaching

There is limited research on teacher absenteeism, substitute teachers and students' results. The difficulty of measuring the effect of teacher absenteeism on student performance is partly due to the fact that teachers are often systematically assigned to students of different ability, and partly due to the fact that teacher absenteeism varies with the teachers' qualifications and the work environment at the school. Clotfelter et al. (2009), Herrmann and Rockoff (2012), Ost and Schiman (2017) and Benhenda (2019) show that absenteeism is more widespread among teachers with shorter education and more experience in the US and France. Absenteeism is also slightly higher for teachers who teach larger classes, or in schools where a larger proportion of students have weaker socioeconomic backgrounds.

The few studies that attempt to measure the causal relationship between teacher absenteeism and student performance exploit differences in absenteeism

over time for the same teacher, in order to take into account differences in teacher quality. Miller et al. (2008a) measure the effect of teacher absenteeism in grade 4 in an American school district. When they study changes in absenteeism for the same teacher, they find that an absence of ten days lowered the students' achievement by 0.033 SD in mathematics, which corresponds to about 0.60 SD per year.[47] Clotfelter et al. (2009) use the same approach to study the effects of teacher absenteeism on students' performance in grades 4–5 in the US. They show that an absence of ten days lowered the students' results by 0.017 SD in mathematics and 0.009 SD in reading respectively, which corresponds to around 0.16–0.30 SD per year. It is primarily the learning of low-achieving students that is impacted due to teacher absenteeism. They also show that qualified substitute teachers can mitigate some of the negative consequences of teacher absenteeism.

Herrmann and Rockoff (2012) use differences in absenteeism over time for the same teacher, in the same grade and at the same school, to measure the effects of teacher absenteeism among students in grades 4–8 in New York. They find that an absence of ten days lowered test scores by 0.012 SD in mathematics and 0.006 SD in reading, which corresponds to 0.22 SD and 0.11 SD respectively per year.[48] The students' achievements are most adversely affected when experienced teachers are absent. However, the consequences of teacher absenteeism do not differ across schools that have different student backgrounds. It is, in particular, short periods of absenteeism that worsen students' results, which may be due to the difficulty of finding suitable substitute teachers and the limited amount of time they have to prepare lessons. However, the effects are similar regardless of whether the teacher is absent due to illness or absent for some other reason.

Benhenda (2019) examines the extent to which substitute teachers can mitigate the negative consequences of teacher absenteeism among students in grade 9 in France. She studies differences in absenteeism over time for different subject teachers who taught students in the same class. The students' performance fell by approximately 0.003 SD when their teacher was absent for ten days and substitute teachers were not assigned, which corresponds to 0.054 SD per school year. Substitute teachers mitigated the reduction in learning by an average of 0.001 SD, but there were significant differences between different types of substitute teachers. Qualified and experienced substitute teachers can

[47] In a follow-up study (Miller et al. 2008b) the authors use snowfall as an instrument for teacher absenteeism and then find very strong negative effects of teacher absenteeism, possibly because snowfall has also been shown to affect student absenteeism (Goodman 2014).

[48] They also conducted several placebo tests that support a causal interpretation of the results, including that the variation in teacher absenteeism does not correlate with the students' previous performance, and that teacher absenteeism after the students have taken the tests had no impact.

mitigate the negative consequences of teacher absenteeism by up to 25 percent, while other substitute teachers have no significance at all. This imply that if the possibility of finding suitable substitute teachers depends on the socio-economic composition of the schools – which is the case in both France and the US – it can have negative consequences for equality of opportunity (Liu et al. 2020).

Problems with teacher absenteeism are significantly greater in developing countries than in the industrialized world. Duflo et al. (2012) conducted a randomized trial to investigate whether monitoring and economic incentives could reduce teacher absenteeism in India. In the schools where the experiment took place, the teachers were photographed at the beginning and end of each school day and the teachers were paid in proportion to the number of days they were present. During the 30 months that the experiment lasted, absenteeism among teachers halved – from 42 to 21 percent – and the students' performance improved. The authors show that the reduction in teacher absenteeism increased the students' results by 0.17 SD, which corresponds to about 1 SD per school year.

Overall, the research shows that teacher absenteeism causes significant adverse consequences for students. Students lose almost as much knowledge when their teachers are not in school as when they themselves are absent; teacher absenteeism reduces results by the equivalent of 0.10–0.30 SD per year. Substitute teachers can only partly mitigate the negative consequences of teacher absenteeism, and only if they are highly skilled. Short-term teacher absenteeism has the greatest negative consequences, probably because it makes it more difficult to find suitable substitute teachers while also reducing the substitute teachers' preparation time. There are some indications that absent teachers have greater negative effects in mathematics, in the lower grades and for low-achieving students. It is more difficult to determine to what extent the results of teacher absenteeism in schools can be generalized to staff absenteeism in preschools. However, it seems reasonable to believe that preschool children are also negatively affected by staff absenteeism.

## 3.5 How may student performance have been affected by the COVID-19 pandemic?

The COVID-19 pandemic has led to a sharp increase in absenteeism among Swedish preschool children, students and staff. My estimates show that the share of children who were home from preschool increased by about 50 percent, while student absenteeism in compulsory school increased by almost 70 percent. Furthermore, absenteeism among staff increased by about 70 percent. The research review shows that absenteeism among preschool children, students and

teachers affects student performance in the short term, and their earnings in the long term. In this section, I will attempt to assess how the increased absenteeism during the pandemic may affect students and society.

### 3.5.1 Preschool

The share of children who stayed home from preschool during the period March–December 2020 increased by an estimated 3.5 percentage points compared to the corresponding period in 2019. This means that the children have, on average, been absent from preschool for almost five days more than normal.[49] Previous research shows that preschool attendance has significant positive effects on children's development and life chances. One year in preschool can improve children's performance in reading and mathematics at the start of school by 0.35–0.60 SD, with greater effects for children with low-educated parents. If we assume that preschool increases children's social and cognitive abilities by 0.35 SD per year – and that children spend 174 days per year in preschool – one day's absence would result in a reduction in skills of approximately 0.002 SD (-0.35/174). Increased absenteeism during the initial phase of the pandemic (March – December 2020) is thus expected to impair children's development by 0.010 SD (-0.002 × 0.035 × 136).

The negative consequences of higher absenteeism among preschool children can be partly offset by smaller groups for the children who do attend. The average preschool group has 15 children (National Agency for Education 2019a), which means that the groups have decreased in size by an average of just under 0.5 children ((15-1) × 0.035)[50]. The literature review shows that smaller classes in schools have positive effects on learning, and there is reason to believe that this also applies to children in preschool. Assuming that a reduction in the number of children in the groups by one child over a one-year period improves development by 0.01 SD, then one day of attendance in a group with an average reduction in group size during the pandemic would improve results by approximately 0.00003 SD ((0.01 / 174) × 0.5). Although the effect of small preschool groups during the pandemic is very small, it is expected to affect all children present, which has a positive effect on children's learning corresponding to 0.004 SD (0.00002 × (1-0.035) × (1-0.03) × 136).

It is more difficult to determine how increased absenteeism among preschool staff during the COVID-19 pandemic has affected children's development. My

[49] It is estimated that children attend preschool for approximately 136 days in the period from March–December (weeks 10–50).
[50] The average size of preschool groups for the children present depends on the probability that one of the other children in the group – which on average amounts to 15-1 children – is absent.

estimates show that staff absenteeism in preschools has increased by approximately 3 percentage points, which means that staff have been absent four days more than normal. The existing research on teacher absenteeism in schools can probably not be transferred directly to children in preschools, but it is still likely that preschool children are negatively affected by the absence of staff. If we assume that the children can benefit from 25 percent of the educational activities when a regular member of staff is absent, one day's absence among the staff would impair the children's development by 0.0015 SD (-0.002 + 0.00003) × (1-0.25)).[51] Increased staff absenteeism during the initial phase of the pandemic is thus expected to lead to a reduction in skills of approximately 0.006 SD (-0.0015 × 0.03 × 136).

To determine how increased absenteeism in preschools during the COVID-19 pandemic is expected to affect children's development altogether, we must consider both the effects that arise when children are absent and when they are in preschool. The increased absenteeism among children in preschool is estimated to lead to a reduction in learning corresponding to 0.010 SD. However, the negative effects of increased preschool absenteeism are partly offset by the beneficial effects of smaller preschool groups for the children who are present, which is expected to improve children's development by approximately 0.004 SD. Furthermore, increased staff absenteeism is estimated to impair the children's cognitive and social abilities by approximately 0.006 SD. Overall, increased absenteeism among preschool children and staff during the initial phase of the pandemic is expected to impair children's development by approximately 0.012 SD (-0.010 + 0.004-0.006).[52] Increased absenteeism in preschools during the pandemic is thus less important for children's learning on average. However, it is primarily the development of the children who are absent that risks being impeded, while children who do attend can even benefit from smaller preschool groups. It is also likely that the negative consequences are greater for children from weaker backgrounds.

Research shows that time in preschool affects income in the long run. The children's impaired development due to increased absenteeism during the pandemic may thus have consequences for their future life chances. The review of previous studies shows that the economic return to skills amounts to approximately 10 percent. If we assume that the effect on income persists

[51] The children are expected to benefit from smaller preschool groups even when the regular staff is not present.

[52] I am assuming that increased absenteeism among staff and preschool children during the pandemic are independent of each other, which is probably not the case. However, the results are not much affected if the absenteeism among preschool children and staff is allowed to be positively correlated.

throughout a person's working life – and that the discounted lifetime income amounts to SEK 7.3 million[53] – reduced learning during the pandemic would impair the children's future lifetime income to roughly SEK 8,600 (-0.012 × 0.10 × 7,300,000). Increased absenteeism in preschools is thus expected to have very modest consequences for children's future labour market outcomes on average, even though it may have greater significance for certain groups of children.

The costs to society of increased absenteeism during the pandemic may be significantly higher than that of individuals, as a lot of children attend preschool. In the academic year 2018/19, approximately 518,000 children were registered at preschool (National Agency for Education 2019b). If we sum all children's reduced lifetime income due to increased absenteeism in preschool during the initial phase of the pandemic, the cost to society is expected to amount to just under SEK 4.5 billion (-8,600 × 518,000).[54] It is, of course, a very rough estimate of the costs of reduced learning, but it gives an indication of the magnitudes.[55] Increased absenteeism during the pandemic can thus have significantly larger consequences for the economy than for the average preschool child.

[53] The estimate of lifetime income comes from the underlying data in (Fredriksson and Öckert 2014), and has been calculated by summing individuals' earned income (including employer contributions) before tax for the age range 16–64, discounted at 16 years of age with an interest rate of 2 percent, and adjusted to 2020's monetary value.

[54] Assuming that wages correspond to workers marginal productivity – which is expected in a perfect labour market – the reduced incomes can be interpreted as the value of production lost. However, the calculations do not take into account that reduced worker productivity in turn can affect the demand for and productivity of other inputs – such as machines.

[55] Note that the calculations are only intended to capture the value of reduced learning as a result of increased absenteeism during the pandemic, and do not constitute a complete cost-benefit analysis. Increased absenteeism among preschool children and students, for example, will probably also reduce productivity for parents who stay at home with their children. Furthermore, the health effects of absenteeism or illness due to COVID-19 have not been considered. It is thus likely that I have underestimated the costs of increased absenteeism in preschools during the pandemic.

**Table 1** Estimated effects of increased absenteeism in preschools during the initial phase of the pandemic

| | Effect size for learning (SD) | Effect size for income (SEK) | Probability | Days | Effect on learning (SD) | Effect on income (SEK) |
|---|---|---|---|---|---|---|
| Child absenteeism | -0.0020 | -1,468 | 0.035 | 136 | -0.010 | -6,990 |
| Smaller groups | 0.00003 | 21 | (1-0.035)×(1-0.03) | 136 | 0.004 | 2,617 |
| Staff absenteeism | -0.0015 | -1,086 | (1-0.035)×0.03 | 136 | -0.006 | -4,275 |
| Total | | | 1.00 | 136 | -0.012 | -8,647 |
| Sum of all children | | | | | -6,136 | -4,480,000,000 |

*Note:* The table shows the estimated effects of increased absenteeism in preschool during the period March–December 2020 (weeks 10–50). The effect size for learning has been obtained from previous studies. It is assumed that absent children's learning will be impaired by 0.35/174 SD per day. A reduction in the size of the preschool groups by one child is assumed to improve children's development by 0.01/174 SD per day. On average, the preschool groups decreased by (15-1) × 0.035 children during the period, which results in an increase in learning of (0.01/174) × (15-1) × 0.035 SD per day. It is assumed that children are able to benefit from 25 percent of the educational activities when regular staff are absent, which is expected to impair development by ((0.35/174) - ((0.01/174) × (15-1) × 0.035)) × (1-0.25) SD per day. The effect size for income has been calculated by multiplying the effect size for learning with a return on abilities (10 percent) according to the literature, and estimated discounted lifetime income at the current monetary value (SEK 7,300,000) that come from the underlying data in Fredriksson and Öckert (2014). The effects on learning and income have been calculated by multiplying the effect size by the probability of the event and the number of days. The effect size on learning is expressed in standard deviations (SD), while the effect size on income is expressed in Swedish krona (SEK).

Table 1 summarizes the calculations of the expected effects of increased absenteeism among preschool children and staff during the initial phase of the COVID-19 pandemic (March–December 2020) in Sweden. Overall, the increased absenteeism during the pandemic will probably have very minimal effects on individual children's development and life chances, although children with a high level of absenteeism or who come from weaker backgrounds may have been hit harder. However, since attending preschool affects all children's income later in life, the costs to society may be significant. My very rough calculations indicate that the costs of increased absenteeism in preschool during the initial phase of the pandemic may lead to future production losses that are equivalent to SEK 4.5 billion.

### 3.5.2 Compulsory school

Student absenteeism in compulsory school has risen by an estimated 4 percentage points during the period March–December 2020, which corresponds to more than 5 days per student.[64] The literature review shows that learning in school is significant; one year in school improves performance by about 0.2–0.3 SD. It also does not appear that absent students have been offered distance education to any great extent during the pandemic, which is why it has probably not significantly mitigated the reduction in learning. If we assume that a school year improves student performance by 0.25 SD, a day's additional absence would result in a reduction in skills of 0.0014 SD (-0.25/174). This means that an increase in absenteeism by 4 percentage points is expected to impair learning by approximately 0.008 SD (-0.0014 × 0.04 × 136).

Just as in preschool, the negative consequences of increased student absenteeism in schools is partly offset by the positive effects of smaller classes. Normally, there are about 21 students per class in compulsory school in Sweden (OECD 2020). This means that class size has decreased by an average of 0.8 students ((21-1) × 0.04) during the pandemic. Assuming that the students' achievement improves by 0.0075 SD when the class has one less student during a school year, the average reduction in class size during the pandemic would improve student outcomes by approximately 0.00003 SD (0.0075/174 × 0.8) per day. Thus, the reduction in class size during the pandemic is expected to improve learning by an average of approximately 0.004 SD (0.00003 × (1-0.04) × (1-0.03) × 136) for students who are present.

Absenteeism among teachers in compulsory school during the pandemic is estimated to have increased by about 3 percentage points, which means that

[64] Students attend school for approximately 136 days during the period from March–December (weeks 10–50), while a school year consists of approximately 174 school days.

teachers were absent 4 days more than usual during the period March–December 2020. The research review shows that students are affected almost as much by teachers' absenteeism as by their own absenteeism; one year of teacher absenteeism lowers the students' results by 0.10–0.30 SD. Substitute teachers also do not seem to be able to significantly mitigate the negative consequences of teacher absenteeism. Thus, it seems to be less problematic that there is no information concerning how many lessons that have been replaced by colleagues or substitute teachers during the pandemic. Assuming that students only learn 25 percent of what they usually do when their teachers are absent – either because substitute teachers cannot fully replace regular teachers or because lessons are cancelled – one day of teacher absenteeism would impair students' learning by approximately 0.0011 SD ((-0.0014 + 0.00003) × (1-0.25)) This means that increased teacher absenteeism is expected to reduce the student performance by approximately 0.004 SD (-0.0011 × 0.03 × 136).

To calculate the total effects of increased absenteeism among teachers and students in schools during the initial phase of the pandemic, we must consider both the effects that arise when students are absent and when they attend school. Increased student absenteeism during the pandemic is expected to impair results by approximately 0.008 SD. However, the negative effects of absent students are partially offset by smaller classes for students who are present, which is estimated to benefit skills by approximately 0.004 SD. Furthermore, increased teacher absenteeism during the pandemic is estimated to impair learning by approximately 0.004 SD. In total, the effect of increased absenteeism in schools during the initial phase of the pandemic is thus estimated to worsen student performance by approximately 0.008 SD (-0.008 + 0.004-0.004). Increased school absenteeism is therefore expected to have only minor impact on learning for the average student. It should be emphasized that for students with a high level of absenteeism, the loss of knowledge can be significant, while students who are present can even benefit from smaller classes. It is also likely that the negative consequences of increased absenteeism in schools will particularly impact children with low-educated parents.

The literature review shows that instructional time affects both students' school results and future income. Reduced learning due to increased school absenteeism during the pandemic may thus affect the students' life chances. If we assume that the economic return to skills is 10 percent – and that lifetime income amounts to SEK 7.3 million – increased absenteeism during the initial phase of the pandemic is expected to reduce future income by approximately SEK 5,500 (0.008 × 0.10 × 7,300,000). Thus, even though absenteeism did increase during the pandemic, the increase is not large enough to significantly

change the students' life chances. However, the future loss of income may be significantly greater for students with a high level of absenteeism or who come from disadvantaged socioeconomic backgrounds.

The costs to society of increased absenteeism among students and teachers may be significantly higher than for individual students, as there are many students in school. In the academic year 2018/19, the number of students in compulsory school was just under 1,068,300 (National Agency for Education 2019a). If all students' loss of income is summarized, the cost of increased absenteeism to society during the pandemic is expected to amount to approximately SEK 5.9 billion (5,500 × 1,068,300). Even though the calculation contains a high degree of uncertainty, it still shows that considerable societal values are lost when students and teachers are not in school.

Table 2 summarizes the calculations of how increased absenteeism among students and teachers in compulsory school during the initial phase of the COVID-19 pandemic in Sweden is estimated to affect individuals and society. In summary, increased absenteeism is only expected to have very small average effects on the students' achievement and future income. It is likely that some schools and groups of students have been affected more significantly. The societal costs of increased absenteeism can still be extensive. My very rough estimates show that increased absenteeism during the initial phase of the pandemic (March–December 2020) is likely to lead to a loss of production of approximately SEK 5.9 billion.

**Table 2** Estimated effects of increased absenteeism in compulsory school during the initial phase of the pandemic

| | Effect size for learning (SD) | Effect size for income (SEK) | Probability | Days | Effect on learning (SD) | Effect on income (SEK) |
|---|---|---|---|---|---|---|
| Student absenteeism | -0.0014 | -1,049 | 0.04 | 136 | -0.008 | -5,706 |
| Smaller classes | 0.00003 | 25 | (1-0.04)×(1-0.03) | 136 | 0.004 | 3,188 |
| Teacher absenteeism | -0.0011 | -768 | (1-0.04)×0.03 | 136 | -0.004 | -3,007 |
| Total | | | 1.00 | 136 | -0.008 | -5,525 |
| Sum of all students | | | | | -8,085 | -5,902,000,000 |

*Note:* The table shows the estimated effects of increased absenteeism in compulsory school during the period from March–December 2020 (weeks 10–50). The effect size for learning has been obtained from previous studies. Absent students are assumed to have their learning impaired by 0.25/174 SD per day. A reduction in class size by one student is expected to improve the results of students who are present by 0.0075/174 SD per day. On average, class sizes decreased by (21-1) × 0.04 students during the period, which leads to increased learning of (0.0075/174) × (21-1) × 0.04 SD per day. Students are assumed to be able to benefit from 25 percent of the instruction when their teacher is absent, which is expected to impair their results by ((0.25/174) - ((0.075/174) × (21-1) × 0.04)) × (1-0.25) SD per day. The effect size for income has been calculated by multiplying the effect size for learning with the return to skills (10 percent) according to the literature, and estimated discounted lifetime income at the current monetary value (SEK 7,300,000) from the underlying data in Fredriksson and Öckert (2014). The effects on learning and income have been calculated by multiplying the effect size by the probability of the event and the number of days. The effect size on learning is expressed in standard deviations (SD), while the effect size on income is expressed in krona (SEK).

## 3.6 Concluding remarks

Sweden chose to keep preschools and schools open at the start of the COVID-19 pandemic. With detailed data from various sources, I have shown in this chapter that absenteeism among children, students and staff in preschools and schools has risen sharply. Estimates show that the share of children who have been home from preschool has increased by approximately 50 percent during the initial phase of the pandemic (March–December 2020), while absenteeism among students in compulsory school has increased by almost 70 percent. Absenteeism among staff in preschool and compulsory school is estimated to have been approximately 70 percent higher than 2019. The research review shows that instructional time is of considerable importance for student outcomes in both the long and short term. Students who are absent from school miss out on teaching and risk falling behind. When teachers are absent from school, students cannot benefit from the instruction either. This results in reduced learning. The negative consequences of teacher absenteeism do not seem to be significantly mitigated by substitute teachers.

Based on previous research, I have attempted to estimate the consequences of increased absenteeism during the pandemic. Overall, the student performance does not seem to be significantly affected on average, although some preschools, schools, and groups of students have probably been hit harder. My estimates show that the pandemic may have impaired the cognitive development of an average preschool child by 0.012 SD. In compulsory school, my calculations indicate slightly smaller effects; increased absenteeism among teachers and students may have lowered the student achievement by an average of approximately 0.008 SD. Thus, the current level of absenteeism during the pandemic is not expected to affect either grades or Swedish students' performance in international student assessments like PISA or TIMSS.[65]

Although the learning losses due to increased absenteeism in schools is probably negligible, the consequences for the society are significant. The research review shows that time in school affects individuals' income in the long term. If the future loss of production is summed up over a lifetime for all children and students, the cost of increased absenteeism during the pandemic amounts to SEK 4.5 billion for preschool and SEK 5.9 billion for compulsory school. In total, I thus estimate that increased school absenteeism in Sweden during the

[65] Grade statistics for years 6 and 9 in the 2019/20 academic year indicate very minor changes in relation to 2018/19. (National Agency for Education 2020c; d). Although the school results are not expected to be affected by increased absenteeism during the pandemic, it seems likely that Swedish students will perform better in relation to countries that chose to close down the education system, in whole or in part.

initial phase (March–December 2020) of the COVID-19 pandemic will give rise to future production losses corresponding to a value of just over SEK 10 billion.[66] This suggests that even relatively costly measures to reduce absenteeism – or to mitigate its adverse consequences – could still be cost-effective. It should be emphasized that the calculations are very uncertain, but they still indicate that we may have to live with the consequences of the COVID-19 pandemic for the foreseeable future. What the cost will ultimately be, however, depends on how absenteeism in the education system develops in the future.

[66] Even if the costs of higher absenteeism in schools are significant, total school closures – which occurred in many other countries in the spring of 2020 – would have entailed significantly much higher costs for both individuals and society.

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# 4 The COVID-19 pandemic and distance learning – how will academic performance be affected?

**Caroline Hall and Martin Lundin**

One of the big questions during the COVID-19 crisis has been whether schools and universities should be closed down or continue instruction as usual. Policy makers around the world have struggled with this issue. However, it is not a complete closure that has been discussed; the alternative has instead been a transition to distance learning and a greater role for digital solutions. In this chapter, we discuss how academic performance can be expected to be impacted by a switch to distance learning. We do this by reviewing earlier research. Our main focus is on upper secondary and post-secondary education, as it is primarily students at these levels who have been affected by distance learning in Sweden during the initial phase of the pandemic (March–December 2020).[67]

## 4.1 Distance learning in Sweden before the pandemic

Distance (or remote) learning is a form of education where students and teachers do not meet in the classroom (or elsewhere in real life), but use the internet, communication platforms, email, etc. to have classes and communicate. Distance learning can occur synchronously with real-time face-to-face interaction (*fjärrundervsining*). It can also occur asynchronously with self-paced learning activities that take place independently of the teacher (*distansundervisning*). In the first case, students and teachers are separated in space; students follow an online class in real-time and have the possibility to interact. In the latter case, students and teachers are separated both in space and time; for example, when students follow a pre-recorded lecture (SOU 2017:44).

In the Swedish compulsory and upper secondary school system, teaching should be conducted in person (so-called face-to-face instruction). Prior to the COVID-19 pandemic, there were no formal opportunities for distance learning carried out asynchronously, except in adult education at the upper secondary

[67] We do not claim to have reviewed all relevant research. Instead, we have concentrated on studies that can identify causal effects in a credible way, and which we consider particularly relevant for understanding the impact of distance learning in Sweden during the COVID-19 pandemic.

level.[68] Distance learning carried out as synchronous instruction could only be conducted in rare circumstances.[69] According to a survey from 2018, approximately 5–10 percent of Sweden's compulsory and upper secondary schools had students participating in some type of remote learning (National Agency for Education 2018).

In higher education, the situation is different. Distance learning is an established element, and Swedish colleges and universities offered courses online long before the COVID-19 pandemic. However, most teaching took place on site.[70]

Digital technology is a prerequisite for distance learning to work well in practice. In this respect, the Swedish education system has come a long way. In university level education, students are more or less assumed to have access to a computer. About nine out of ten upper secondary schools provide students with their own computer (National Agency for Education 2019). Computer access is also relatively good in compulsory school, at least in lower secondary schools where three quarters of the students received a personal computer from the school in 2018 (National Agency for Education 2019).[71] According to a survey by the Swedish Media Council in 2017, 97 percent of 13–16-year-olds had access to a computer at home, and 99 percent had access to the Internet (Swedish Media Council 2017).

In terms of access to equipment, the opportunities for remote learning should thus be relatively good in Sweden, at least among older students. However, there are reasons to fear that many students do not have a good study environment at home; lack of a separate room and opportunities for peace and quiet, as well as restricted access to a fast internet connection and technical support can constitute problems for many students. In these regards, we can expect strong socioeconomic differences, where the conditions are likely to be worse for students with lower socioeconomic status. We can also expect large socioeconomic differences when it comes to possibilities of receiving help from one's parents with schoolwork. This aspect may not be relevant for university

[68] Even though the Education Act (SFS 2010:800) did not allow asynchronous instruction in compulsory and upper secondary school, this form of education sometimes took place in pilot projects and for pupils living in other countries (SOU 2017:44).

[69] For example, the student base must be either very small or there must be a severe lack of qualified teachers (despite repeated attempts by the school organizer to ensure qualified teachers). There are also additional requirements. For example, the students must be taught on school premises and a mentor must be present to help the students (see e.g. SOU 2017:44).

[70] See, for example, Nyman (2020) and the Swedish Higher Education Authority (2017) for discussions of distance learning in higher education.

[71] Another way to assess computer access is to compute the number of pupils per school computer. According to the National Agency for Education's latest survey (2019), this number was 1.0 in upper secondary school and 1.3 in compulsory school.

students, but it could be important for students in compulsory and upper secondary school.

Access to computers and a good study environment is not enough for distance learning to work well. Teachers may, in some instances, lack the necessary skills.[72] Moreover, the transition to remote instruction during the COVID-19 pandemic happened quickly, giving very limited opportunities for planning, at least in the spring semester of 2020. When distance learning has been used before, for example in higher education and in other countries, there has generally been time to plan and to choose which elements are appropriate for remote instruction. In addition, it has been possible to design the courses based on the premise that the instruction will be conducted remotely.

## 4.2 Distance learning during the COVID-19 pandemic

The spread of COVID-19 escalated during the spring semester of 2020. As a direct result of this, Prime Minister Stefan Löfven announced at a press conference on March 17 that all teaching in upper secondary school, adult education, and higher education would transition to distance learning with immediate effect. During the last three months of the spring semester, all teaching from the upper secondary level and upwards was therefore conducted remotely (with certain exceptions). However, compulsory schools (grades 1–9) were not affected – they remained open as usual.[73]

During the period March–December 2020, several new decisions were made regarding possibilities of providing in person vs. remote instruction at different

[72] In a survey by the National Agency for Education in 2019, around 40 percent of teachers state that they need further training to use digital technology as an educational tool (National Agency for Education 2019).

[73] See, for example, the Government's press conference on 17/03/2020 at www.regeringen.se, as well as information on the National Agency for Education's website (www.skolverket.se). This decision was based on recommendations from the Public Health Agency of Sweden (*Folkhälsomyndigheten*). You can find out more about the Public Health Agency of Sweden's recommendations at www.folkhalsomyndigheten.se. Information from these websites was retrieved on 27/09/2020.

levels of the education system.[74] For example, in late May it was decided that teaching in upper secondary school would again be conducted on the school's premises during the fall semester, although the possibility of partially conducting remote instruction remained. Also, in adult education and higher education, there were increased opportunities to carry out teaching on site. However, the government emphasized that the relevant organizer had to ensure that teaching was organized so that the guidelines that applied to the wider society could be followed.[75] The spread of COVID-19 increased dramatically during the second half of the fall semester. As a consequence, a new decision was made on December 3 implying that all teaching in upper secondary schools would once again be conducted remotely.[76]

The responsibility for the practical readjustment to remote instruction has fallen on local organizers, and, in the end, on individual teachers. In May 2020, the Swedish Teachers' Union (*Lärarförbundet*) conducted a survey among their members. It is not possible to know whether the survey is representative of all teachers, but the results show that three quarters of the upper secondary school teachers who answered the survey had switched entirely to remote instruction, and that nine out of ten mostly held digital classes in the spring. In adult education these numbers were marginally lower. Even though compulsory schools continued to be open throughout the spring, remote learning was sometimes used here as well: In grades 7–9, four out of ten teachers had provided remote instruction to students who were absent during the two weeks preceding the survey. In grades 4–6, the corresponding number was three out of ten, and in

[74] The parliament adopted, among other things, the Law Regarding Temporary Closure of School Activities in the Event of Extraordinary Events in Peacetime (2020:148) on March 19, 2020. The government had already issued Ordinance (2020:115) on Education in the School system and Other Educational Activities in the Event of the Spread of Certain Infections on March 13. School organizers were there given the opportunity (until June 30, 2021), in certain situations, to close a school and transition to distance learning, for example if such a large part of the staff were absent due to COVID-19 that regular teaching could not be conducted, or if the school organizer, in consultation with infectious disease specialists, deemed that the school must be closed to prevent the spread of infection. The ordinance was revised several times in 2020: In August, for example, school organizers were given the authority to decide to implement distance learning in upper secondary school, if this was necessary to prevent congestion on public transport. In November, they were given the same authority if it was deemed necessary to reduce congestion on upper secondary school premises. The general trend during the fall of 2020 was in the direction of increased opportunities for remote instruction.

[75] For example, the general recommendations on social distancing and restrictions on the number of people that were allowed to gather in the same place.

[76] See the Government's press conference on 12/03/2020 at www.regeringen.se. You can find out more about the recommendation concerning distance and remote education from 12/03/2020 at www.folkhalsomyndigheten.se. Information from these websites was retrieved on 12/03/2020.

grades 1–3 two out of ten.[77] A clear majority of the responding teachers found that it was more difficult to teach, as a consequence of the pandemic. Moreover, a majority stated that the transition to remote learning meant that it was more difficult to achieve the educational objectives.

How the pandemic has impacted the school system has been the focus of several reports published in 2020. None of these are based on large and representative samples of respondents, but they may still provide some insight into what have happened in Swedish schools. For example, in the spring of 2020, the National Agency for Education (2020a) conducted interviews with 100 representatives of local school organizers. The overall impression from this study is that the organizers found that it had worked rather well to conduct remote instruction in upper secondary school and adult education. Practical elements (for instance workplace-based learning) were highlighted as being most problematic. Teaching in compulsory school was not impacted that much according to the representatives interviewed.[78]

Another report summarizes the conclusions from several studies conducted by the National Agency for Education throughout the spring of 2020. The report concludes that teaching in upper secondary school and adult education during the spring often consisted of a combination of synchronous and asynchronous remote instruction and classes on the school premises. The overall assessment is that distance learning worked relatively well for the most part, but that certain groups of students are likely to have been more adversely impacted. Students with poor Swedish skills and students with a poor study environment at home are judged to have been negatively affected by distance learning. However, the National Agency for Education also notes that students who did not handle the transition well many times were given the opportunity to receive instruction on the school premises. The report also concludes that the transition to distance learning made assessment and grading more difficult (National Agency for Education 2020d).

A qualitative study by the School Inspectorate (*Skolinspektionen*), based on interviews with 100 principals of upper secondary schools, shares the view that the transition to distance learning generally went well in the spring of 2020, but also pinpoints problems such as difficulties for teachers to notice if students were

[77] In December 2020, the news program Ekot, on Swedish Radio sent a survey to all Swedish municipalities (the response rate was 81 percent). Approximately 30 percent reported that some form of distance learning had been carried out within the municipal compulsory schools in their municipality in 2020 (www.sverigesradio.se 11/12/2020, information retrieved on 11/12/2020).
[78] However, several school organizers expressed concerns about what would happen in the long run, if distance learning were to continue in upper secondary school and if distance learning were to be used also in compulsory school.

falling behind, that students often lost motivation, and that many students felt worse mentally from being isolated from school and one another (School Inspectorate 2020). Both the reports from the National Agency for Education and the School Inspectorate highlight students who have recently immigrated to Sweden as a particularly vulnerable group.

During the fall, the National Agency for Education continued to follow the development by collecting information from school organizers. A survey at the end of September, based on responses from 77 local school organizers, shows that it was common for upper secondary schools to conduct some teaching remotely also in the beginning of fall. Workplace-based learning was in some cases seen as a problematic area, but a majority of the respondents still felt that the problems were fairly minor. The problems were also perceived to be less severe during the fall than during the spring semester (National Agency for Education 2020b). A smaller study of 35 school organizers, focusing on adult education, shows that distance learning was very common in adult education during the first half of the fall semester. One challenge highlighted in the report is education within the scope of Swedish for Immigrants (SFI) (National Agency for Education 2020c).[79]

The knowledge of how the instruction changed at universities and colleges during 2020, and of how remote learning worked here, is so far very limited. However, it is reasonable to assume that online solutions were at least as common as in upper secondary school and adult education. A survey conducted with students at the Faculty of Social Science at the University of Gothenburg in May indicates that the majority of students at the faculty found that distance learning worked relatively well. At the same time, there are some findings of concern: Approximately six out of ten students stated that their motivation declined as a consequence of online classes. The same fraction of students felt that their ability to focus on their studies had deteriorated, and four out of ten felt that their academic performance had worsened (University of Gothenburg, Faculty of Social Science 2020).

## 4.3 What can we learn from earlier research on the effects of distance learning?

In theory, transitioning to distance learning could have both positive and negative effects on how much students learn.[80] One advantage of distance

[79] Lack of digital skills and restricted access to computers and the internet among new immigrants are some problems highlighted in the study. According to the study, schools were often able to lend students computers and tablets, but sometimes they did not have enough technical equipment.
[80] The following discussion is primarily based on a review article by Escueta et al. (2017).

learning often highlighted in the literature is the increased flexibility that this form of teaching entails: students are able to access course material, including recorded lectures, whenever it suits them, and they have greater possibilities to spend more time on the content they find most difficult, and skip parts they have already mastered.[81] Among the concerns raised is the fact that distance learning tends to require more of the students themselves, in terms of planning and self-discipline. Students who struggle with this run an increased risk of falling behind. It is also possible that remote learning takes away opportunities for interaction that arise more naturally when students and teachers meet in person. To meet teachers and fellow students in person can also create more social pressure to perform better and motivate students to be more committed to their studies (Loeb 2020).

Note that the theoretical advantages and disadvantages can differ somewhat depending on whether distance learning occurs synchronously or asynchronously. For example, asynchronous instruction with self-paced learning activities probably provides more flexibility, while opportunities for interaction are better with real-time instruction. In our research review below, we make no distinction between synchronous and asynchronous instruction. In most studies we refer to, distance learning has been conducted asynchronously, but in some studies, there are also elements of real-time interaction.

### 4.3.1 Distance learning in higher education

What does prior empirical research tell us regarding the impact of taking university (or college) courses online, compared to face-to-face in a classroom or lecture hall? A simple comparison of academic performance between students choosing remote instruction and other students, would probably give a misleading answer to this question as the characteristics and circumstances of the groups may differ also in other ways. For instance, distance learning has been historically more common among university students who work at the same time (Statistics Sweden 2012). A potential worse result for remote students could thus

[81] Through distance learning, students can potentially also gain access to a larger supply of courses than can be offered locally. However, it is hard to believe that this has been the case when transitioning to distance learning during the COVID-19 pandemic. Moreover, distance learning is often advocated from a cost-saving perspective, but in this chapter, we will disregard any effects on schools' budget. It is not likely that the rapid transition to remote learning has entailed cost-saving opportunities for schools, rather one could fear the opposite.

be due to the fact that they had less time to devote to their studies, rather than that distance learning is worse for learning.[82]

Figlio, Rush and Yin (2013) has attempted to circumvent this methodological problem by conducting a randomized experiment. Students taking an introductory course in economics at a large prestigious university in the U.S. were randomly assigned to either attend the lectures in person or watch recorded lectures online. Otherwise the course was no different; content as well as examinations and lecturers were the same. The results show that the students who attended the lectures in person on average performed slightly better than those who participated online. For certain groups of students, there was a larger difference in performance: minority students, male students, and students whose prior college GPA was below the median benefited more from being taught in person.[83]

In another well-published study, Bettinger et al. (2017) examine the same question, but using data from a less prestigious university, where it was easier to get admitted, and for a broad range of courses.[84] They find clear negative effects of distance learning for several outcomes: Students participating remotely receive lower grades both in the course taken online and in future courses, particularly when the subsequent course was based on the previous online course. Students who participated remotely also had a higher probability of dropping out. The estimated effects are judged to be large.[85] In line with the results in Figlio, Rush and Yin (2013), it is the weaker students (low previous grades) that are most adversely affected. However, for students with prior GPA in the top three deciles, they find no negative impact of remote learning.

The results from these two studies are in line with the conclusions drawn in a review article by Escueta et al. (2017). The authors review six studies of

[82] For similar reasons, a simple comparison of grades between different cohorts of student (such as a comparison of the GPA of students in the spring semester of 2020 and the GPA of students the previous year) will not yield a credible estimate of the impact of remote instruction on learning during the pandemic. Many factors that are important for student performance differ over time, such as the composition of students. In the current case, it is also not clear if the transition to remote learning during the pandemic has impacted how teachers approach grading.

[83] On average, the students who participated remotely scored 2 points less than those who were taught in person, on a test where the maximum score was 100. Male students scored on average 3.5 points less, those with a GPA below the median scored 4 points less, and those who belonged to a minority (*Hispanic*) as much as 11 points less when being taught remotely. All differences were statistically significant.

[84] In terms of method the authors use an instrumental variables approach, exploiting the fact that the possibility of taking a certain course face-to-face varies between semesters, and also depends on the students' travel time to the campus where the course is held.

[85] Participating remotely led to student grades in that course falling by about a third of a standard deviation. Effects exceeding 0.2 standard deviations are usually considered large in the literature on effects of educational interventions; see Kraft (2019).

randomized experiments (in addition to the study by Figlio, Rush and Yin discussed above) where the aim has been to examine the effects of distance learning compared to being taught face-to-face. Most of these studies are conducted at universities in the U.S. The overall pattern is that distance learning seems to lead to poorer results, although the average difference is often quite small. However, there does not seem to be the same negative pattern for courses where teaching in person is combined with elements that are carried out online.

Given the results of previous studies, there is much to suggest that the transition to distance learning in higher education during the pandemic, on average, has had negative effects on student learning. It is also very likely that the negative effects are mainly concentrated to students who are weakest academically; it is not certain that stronger student groups have been negatively impacted. However, it is difficult to assess how large effects to expect in the Swedish context based on the previous, primarily American, studies. There could be important differences in educational content, and it is also clear from the earlier studies that effect sizes vary depending on the sample of students studied and their circumstances. The fact that the transition to distance learning – at least during the spring of 2020 – was very extensive and took place at very short notice, with no opportunity for planning, suggests that the negative effects could be larger during the pandemic than in previous studies. It should also be added that distance learning on a very large scale and on a non-voluntary basis, and the isolation this has entailed, may have had a negative impact on some students' psychological well-being and motivation (see e.g. School Inspectorate 2020), which in turn may have an adverse effect on their school performance.

### 4.3.2 Distance learning in upper secondary and compulsory school

There are considerably fewer studies of how remote instruction affects learning among upper secondary and compulsory school students. Moreover, the studies that are available tend to be methodologically less convincing; few studies have used experimental or quasi-experimental methods (Escueta et al 2017). There is thus greater uncertainty as to whether the patterns found are truly caused by remote learning, or if they could be driven by other differences between the groups of students compared, or the educational content, that was not possible to account for in the analyses.

An important exception is a randomized experiment among U.S. high school students that has been analyzed by Heppen et al (2017). The authors examine how students' knowledge of algebra is affected by taking a course online rather than being taught face-to-face in a classroom. The course examined provided an opportunity for first year students who had failed algebra to recover their credits.

Around 1,200 students from 17 different schools were randomly assigned to either take the course online or face-to-face. The students who participated digitally followed the course from a classroom and a mentor was available. The online version of the course did not only contain recorded lessons, but also elements of formative assessment and interactive games. The students who participated online reported that they perceived the course to be significantly more difficult. They were also less likely to pass the course and scored lower on an algebra post-test. One possible explanation discussed by the authors is that the online format did not give the teachers the same opportunities to identify gaps in the students' knowledge and adapt the lessons accordingly. However, when examining how well the students performed on subsequent maths courses (one year later) the authors find no statistically significant differences between the two groups of students.

Another study worth mentioning in this context is Fitzpatrick et al (2020). The study examines how switching from a traditional public school to two types of U.S. charter schools, virtual charter schools vis-à-vis charter schools with traditional classroom teaching, affects student achievement.[86] The students examined attended grades 5–8. The authors find that switching from a traditional school to a school where all teaching takes place online, is associated with large negative effects on achievement in both mathematics and English. However, it is important to stress that it is likely that there are more differences between the types of schools compared here, on top of that the teaching took place online instead of in person. For example, the data show that the teachers working at online schools were less experienced, were less likely to have a master's degree, and that the online schools had considerably larger classes. The differences in teacher and school characteristics that the authors can observe in their data can explain parts, but not all, of the negative effects.

The fact that many credible studies suggest that teaching in person (or using a combination of in person and distance learning) is preferable to exclusively relying on remote learning, does not mean that distance learning does not have the potential to also benefit certain students. Heppen et al (2011) investigate the effects of giving U.S. high school students online access to a more advanced course in algebra than their own school could offer. The course was targeted to students considered ready to study more advanced mathematics and was given at a number of randomly selected schools. The results show that the students who were given access to the more advanced online course performed better in

[86] The study uses a matching approach to identify causal effects. Students who switched schools are compared to non-switchers with similar background variables and school results, from the same school, grade and year.

algebra at the end of the school year. They were also more likely to later choose more advanced mathematics courses in high school. In this case, it is not possible to disentangle the effects of taking a more advanced course from the fact that it was provided online, but the results show that the performance of strong and motivated students may benefit from online access to more advanced courses (a larger supply of courses) than what the school itself is able to offer.

To sum up, we can conclude that there is considerably less research on the effects of distance learning at the upper secondary and compulsory school level, than the university level. Nevertheless, the studies that are available align with the analysis of remote learning among university students: negative effects on performance, at least for students who are weaker academically. This suggests that distance learning during the pandemic is likely to have had negative effects on learning in upper secondary school, and in compulsory school, to the extent that remote learning has been implemented also there.[87] On the whole, it is difficult to come up with any plausible reason why remote learning would have more positive effects on younger than older students. The fact that university students are older and more experienced means that they are likely to be better prepared for the additional responsibility that is required to follow a course taught remotely. There are probably also more elements of compulsory and upper secondary education that are not well-suited for remote learning, such as practical elements and workplace-based learning in the vocational programs. Moreover, students who have chosen to pursue studies at a college or university, and who have managed to get admitted, constitute a considerably more positively selected group compared to compulsory and upper secondary school students in terms of academic performance. In compulsory and upper secondary school, there are many more students who struggle academically. Since previous studies so clearly indicate that academically weaker groups of students tend to perform worse when being taught remotely, we can expect that a considerably larger group of students will be negatively affected by remote learning in upper secondary and compulsory school, compared to in tertiary education.

[87] Negative effects and greater socio-economic differences, as a consequence of distance learning during the pandemic, are also supported by a (so far unpublished) study from the Netherlands; see Engzell, Frey and Verhagen (2020). However, this study focuses on younger children (7–11 years of age) than have been subjected to distance learning in Sweden.

## 4.4 What can we learn from earlier research on ICT in education?

The transition to remote instruction in the spring of 2020 also meant more extensive use of technology in teaching. Increased use of ICT may improve students' digital skills, but what effects can we expect on learning in general?

As with distance learning, it is not clear from a theoretical perspective whether we should expect positive or negative effects. In the literature there is a general discussion of whether increased use of technology is preferable to traditional teaching methods: For example, is it more efficient for schools to invest in ICT or to employ more teachers?

One potential advantage of ICT in teaching is that it may enable more individualized instruction that is adapted to the strengths and weaknesses of each student; for example, computer software can provide self-paced instruction that allows students to work at their own pace. Another conceivable advantage that is sometimes mentioned in the literature is increased student motivation. ICT may also provide access to more and better information from various online sources, as well as facilitate communication and feedback (see e.g. Bulman and Fairlie 2016; Hall, Lundin and Sibbmark 2021). As digital technology was already frequently used at all levels of the Swedish education system before the pandemic, schools should already be benefiting from these advantages. For example, they certainly already used the Internet extensively as a communication channel and source of information. For that reason, it is not clear that we should expect the complete transition to digital instruction to offer any major advantages in these respects. Neither is it likely that digital instruction in this context has improved student motivation; the School Inspectorate's survey of principals rather indicates the opposite (School Inspectorate 2020). In terms of digital teaching materials and learning tools, it is doubtful whether the rapid transition to digital instruction during the initial phase of the pandemic led to any major opportunities for schools to benefit from the advantages that digital instruction potentially can bring. Schools closed down for teaching on site some time into the spring semester of 2020, and much of the planning as well as purchasing of teaching materials is likely conducted at the beginning of the semester or school year. Even if there are exceptions, the rapid transition probably often meant that traditional teaching methods were moved online, rather than teachers having the time to make use of the increased digitalization in a way that fundamentally changed teaching practices. However, the opportunities to plan and prepare for the use of digital teaching materials and learning tools may have been better for the fall semester of 2020.

Increased involvement of ICT in teaching may also have certain drawbacks. Aside the financial costs, the literature mentions implementation challenges, technical problems, and difficulties getting some teachers to learn and exploit the potential of the digital technology (see e.g. Haelermans 2017; Hall, Lundin and Sibbmark 2021). Greater access to social media and web browsing may also imply elements of distraction, which could have a negative impact on learning. The idea that technology may distract students has received support in empirical research. Carter, Greenberg and Walker (2017) analyze an experiment conducted at the U.S. Military Academy, where students in randomly selected classrooms were forbidden from using computers during lectures. At subsequent exams, the students who were not allowed to use computers performed significantly better.

Empirical research has also investigated how different types of ICT investments in schools have impacted students' results. Bulman and Fairlie (2016) review the existing evidence and conclude that few studies find that general investments in ICT lead to enhanced student performance. However, most of the studies reviewed focus on students younger than upper secondary school and university students. In line with the conclusion in Bulman and Fairlie (2016), Hall, Lundin and Sibbmark (2021) find that one-to-one computer initiatives in Swedish lower secondary schools do not affect student performance on average.[88] However, the results indicate some negative effects among students whose parents have a lower level of education.

Overall, the literature indicates that we should probably not expect any positive impact on student learning from the increased digitalization brought about by the rapid transition to remote instruction, aside from that students' digital skills may have improved. Neither is it likely that the digitalization itself has had a negative impact for the vast majority of students, but there are reasons to pay particular attention to how students with lower socioeconomic backgrounds have been affected.

## 4.5 Concluding discussion

In this chapter we have reviewed previous research and discussed how the rapid transition to distance learning in (primarily) upper secondary schools and universities during the initial phase of the COVID-19 pandemic may have affected student performance. Earlier studies find negative effects of distance learning, particularly for students who are weaker academically. These studies do come from other contexts, and are almost exclusively based on U.S. data, but

[88] The study compares how results on national tests, and the transition to upper secondary school, develop in schools that introduce one-to-one computer programs, with the corresponding development in comparable schools without such programs.

they study situations where the schools have had considerably more time to prepare and work out the format for distance learning than was the case during the initial phase of the COVID-19 pandemic. This suggests that the adverse effects could be larger in the present situation. What could potentially counteract a more negative impact in the current context, is if the "crisis mood" that prevailed at the time meant that the teachers (and perhaps also students) took on an exceptionally large responsibility for maintaining high quality in the education system.

The fact that the literature so clearly shows that it is primarily already disadvantaged students that suffer academically from remote learning, means that we can expect increased inequality in educational outcomes based on socioeconomic background in the wake of the pandemic. In the long run, this may also impact students' labour market prospects, for instance if more students fail to graduate from upper secondary school or if they receive lower grades, and consequently will have a harder time proceeding to higher education. However, how students are affected in the end will depend on to what extent the pandemic continues to affect the education system, and on how well schools manage to compensate those who have been negatively impacted. The survey conducted by the National Agency for Education (2020a) indicates that upper secondary schools often made efforts to prioritize final year students. For first- and second-year students, there should be some possibilities for compensatory measures during their remaining education. The same applies to university education.

Finally, it is important to stress that we have discussed the effects of distance learning compared to being taught in person at school. Even if previous studies find that remote solutions are a worse alternative for many students, it is considerably better than no instruction at all. The technological development in society and the digitalization process that has taken place in Swedish schools recently, which for instance has led to almost all upper secondary schools providing students with personal computers even before the pandemic (National Agency for Education 2019), has created rather favourable conditions for a rapid transition to remote learning. Without this development, the cost of managing the pandemic in terms of reduced learning would probably have been much higher.

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# 5 Recessions and the demand for education

**Helena Holmlund**

Adolescents and young adults have a weaker position in the labour market compared to many other groups, and recessions have previously had considerable negative consequences for young people (Nordström Skans 2011). Shorter education and less work experience mean that youth cannot compete with older, better educated and more experienced job applicants. The economic downturn in the wake of the COVID-19 pandemic can therefore be expected to impact today's youth for a considerable future. Moreover, the coronavirus pandemic has impacted the sectors where young people often find their first jobs, such as the service, hotel and restaurant industries, which means that they are particularly vulnerable in the current crisis. Young people can neither travel, work nor study abroad, which in normal circumstances is appealing to the young who are about to enter adulthood.

Young people are however more flexible than older groups. They can to some extent adjust to crises by continuing to study instead of looking for work, and by adapting their field of study to the demands of the labour market.[89] In previous recessions, the Swedish government has increased funding for higher education in order to offer more young people an opportunity to study. The aim of this policy has been both to "protect" young people from unemployment and to improve their human capital, which in itself reduces the risk of unemployment. For example, the number of places at Swedish universities increased during the 1990s recession, and in the years following the Great Recession in 2008 (Swedish Fiscal Policy Council 2010). But rapid expansions of the education sector may come with drawbacks – they can lead to lower education quality, as education providers cannot rapidly train and recruit lecturers with the necessary skills. The quality aspect is also of particular relevance in the current crisis, since teaching has rapidly transitioned to digital instruction, which is likely to be less effective than in-person teaching (see Chapter 4).

In this chapter we focus on how young people's demand for education is affected by economic downturns, with a particular emphasis on the situation for

[89] Naturally, older people are also able to retrain and attend further education, but as they have fewer years left until retirement compared to young adults, it is less probable that further education will be profitable for them.

adolescents and young adults in Sweden during the COVID-19 pandemic in 2020. The chapter begins by presenting a theoretical framework that describes young people's education decision. Thereafter, it presents statistics on the current expansion of the education sector in Sweden and concludes by summarizing previous research on how recessions affect the demand for education.

## 5.1 Unemployment and the demand for education

Young people who have graduated from upper-secondary school face the choice of entering the labour market or continuing to study. The choice between these alternatives is described in human capital theory as an investment decision, where the individual compares different types of costs and revenues that are associated with the two alternatives (Becker 1964). When the perceived benefit of further education (university education or some other form, such as adult vocational education or vocational college) is higher than the benefit of starting to work after upper-secondary school, the individual will choose to study.[90] The example below illustrates the decision to start a university education, but the reasoning is general, and can be used to analyse educational choices at various levels in the education system, between programmes and between the choice of completing or dropping out of an education.

A university education implies higher wages in the future, upon completing the education, but has an opportunity cost as it involves foregone earnings during the study period. The wage premium for a university degree will thus affect how profitable and attractive it is to continue studying. But other factors will also impact the expected benefit of different educational choices. Individuals who are motivated to study find it easier to complete a programme within the expected time, which means a lower cost and a higher probability of choosing further education. Furthermore, individuals value future income differently – some prefer a high income as soon as possible, while those who choose further education are willing to forego wages today in order to receive higher wages in the future. It is also more profitable to get an education when young, since the individual will receive the higher wage for a longer period.

A factor that is crucial for the educational choice, and which is specifically linked to economic cycles, is the risk of unemployment. The unemployment risk affects expected future income, and is generally lower for the highly educated than for those with a lower level of education, which must be factored in when

[90] More specifically, the trade-off can be formulated as the individual comparing the discounted present value of the expected revenue flow for upper-secondary school and further education respectively.

considering different educational paths. In times of economic downturns, the risk of unemployment will affect young people's choices in several ways. When unemployment among young people rises, the opportunity cost of studying falls and it will be relatively more attractive to invest in education. Youth that become unemployed during economic crises risk suffering so-called scarring effects (see Chapter 6 on young people's labour market entry), which entail long-term negative effects on labour market outcomes in terms of lower wages and a higher risk of unemployment in the future. Thus, based on human capital theory, we can expect that an economic crisis that impacts adolescents and young adults means that a university education will be more attractive compared to an upper-secondary-school education, thereby increasing the demand for higher education.

In the long term however, a large inflow of students into higher education will lead to an increased supply of university-educated labour. According to economic theory, this will cause the return on a university education to fall. If individuals do not take into account the long-term effects of large inflows into higher education, and specifically that it may lead to lower returns to education in the future, there may be an overreaction where too many people choose to enter higher education. As it is difficult to predict what the return to investing in education will be in the future, there is a risk that young people make educational choices that are both privately and socially inefficient, and this can happen both when unemployment rises and when it falls.

The education decision can also be formulated as a choice between different fields of education, where the expected return to different educational programmes are weighed against each other. Thus, the individual who chooses between different programmes can be expected to make an assessment of how the demand for labour will develop within different industries. Economic crises that have a particularly adverse impacts on certain industries may therefore affect the application patterns to different programmes, if young people predict that the industry-specific demand will persist or lead to structural changes. Particular to the crisis due to the coronavirus pandemic is that certain industries have seen increasing demand for labour: healthcare personnel and laboratory staff are groups that are in high demand, and where supply cannot meet demand in the short term. However, it is unclear how persistent this demand shock will be – if the crisis abates in a few years and demand for healthcare personnel falls again, it is not optimal that young people let the current demand pattern govern their choice of education.

The next section will move from theory to empirics, and demonstrate how young people's demand for different forms of education and programmes has changed in connection with the coronavirus pandemic in Sweden.

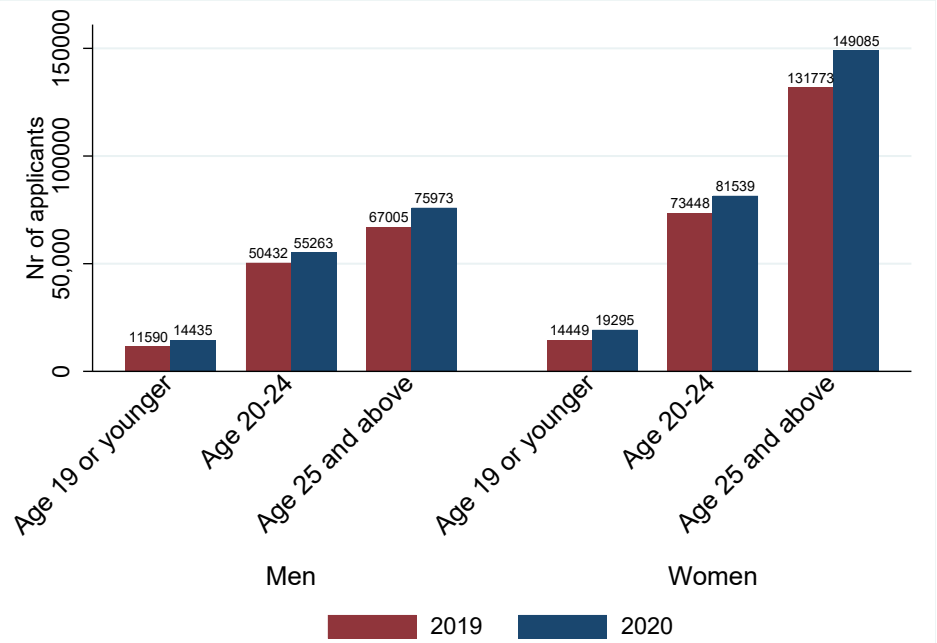
## 5.2 Labour market and educational opportunities for young people in Sweden 2020

During the first two months of the pandemic, in the spring of 2020, more than twice the number of young people (aged 18–24) registered as unemployed at the Swedish Public Employment Service (PES) (Arbetsförmedlingen), compared to the corresponding period in 2019 (PES 2020). The forecast for youth unemployment is uncertain but in June 2020, the PES estimated that youth unemployment would be 13 and 15.2 percent in 2020 and 2021, respectively. This can be compared with the corresponding level of unemployment during the Great Recession, which was 16.1 percent in June 2009.[91] As the coronavirus crisis had a severe impact on industries where many young people find their first jobs, and there is an ongoing structural change where low skill jobs in retail are disappearing and might not come back, there is a risk that the impact on young people that become unemployed in the wake of the pandemic will be particularly severe (PES 2020).

Rising youth unemployment has increased young people's demand for continued education. Applications to universities and colleges increased sharply before the autumn term of 2020, see Figure 5.1. The increase can partly be explained by young people who begin their studies earlier than anticipated, since the possibilities to take a gap year for work or travel are limited, and partly by worsening labour market conditions pushing more people to apply to higher education. The total number of applicants increased by 13 percent compared to the previous year, and among young applicants (19 years old or younger) the number of applicants increased by as much as 30 percent (Swedish Council for Higher Education 2020a). Among the youngest applicants, applications increased somewhat more among women (34 percent) than among men (25 percent). The number of eligible applicants also increased by 16 percent, which could indicate that young people who could previously choose between working and studying, are now applying to higher education to a greater extent.

[91] Youth unemployment is not an unproblematic measurement of young people's opportunities in the labour market. The proportion of unemployed young people is generally high, but to some extent it is due to the fact that unemployment is calculated as a share of the labour force, and many young people who study are not included in the labour force. Furthermore, this measurement does not take into account whether the periods of unemployment are long or short. Among young people, it is common to have many but short periods of unemployment, which is less problematic than long-term unemployment.

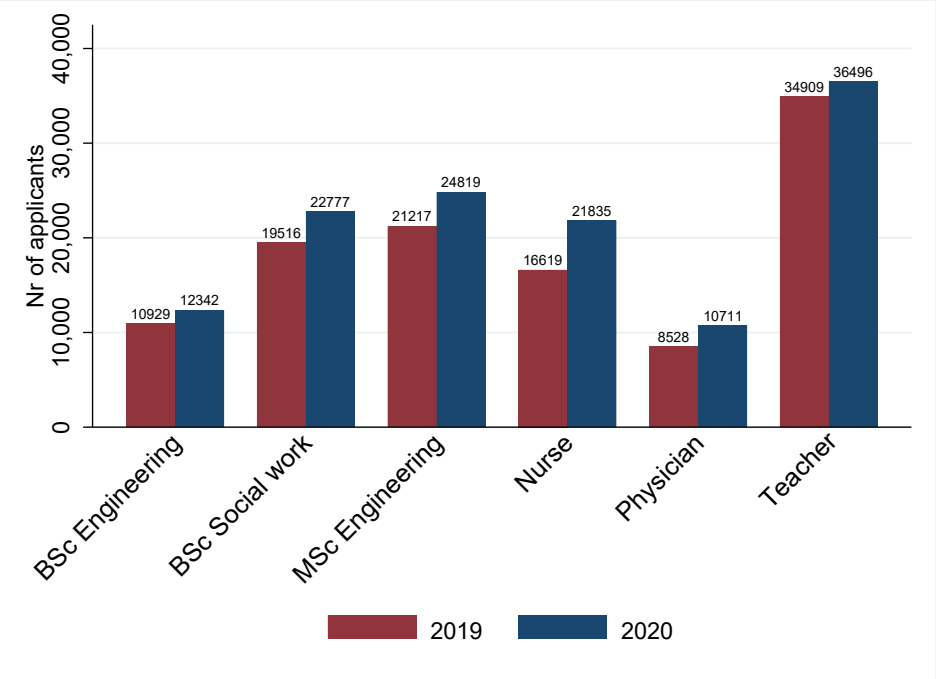
**Figure 5.1** Number of applicants to universities and colleges before the autumn terms of 2019 and 2020




*Source:* Swedish Council for Higher Education 2020a. The figures refer to the number of applicants.

The number of applications increased to both individual courses and programmes, as well as to programmes that lead to a professional degree. Figure 5.2 shows that the number of applications increased in particular to nursing training (31 percent) and medical school (26 percent).

**Figure 5.2** The number of applications to professional programmes before the autumn terms of 2019 and 2020




*Source:* Swedish Council for Higher Education 2020a.

Young people's increased demand for education is not limited to universities and colleges; there is also an increase in the demand for adult education. The National Agency for Education (Skolverket) (2020) has conducted interviews with a number of school organizers, and a majority report that the number of applications increased to both vocational programmes and upper-secondary school courses. They also report an increased number of applications to vocational programmes within healthcare and social care.

The government policies that aim to limit the negative consequences of the recession include investments to increase the number of places at universities and colleges, as well as expansions of vocational colleges (yrkeshögskolan) and regional adult vocational training (regional yrkesvux). Overall, the number of full-time slots at universities and colleges increased by approximately 7,600 in 2020, and approximately 18,900 in 2021 (Government bill 2020/21:1). This can be compared to the total education budget in 2019, which corresponded to approximately 301,700 full-time places (Swedish Higher Education Authority 2020). The universities have a great deal of freedom to allocate funds across different programmes, but some initiatives are targeting professions where there

is a shortage of personnel, such as pre-school teachers, teachers, nurses and physicians. As the interest in university education has grown and the number of available slots has increased, the number of admissions has increased by 10 percent compared to the previous year (Swedish Council for Higher Education 2020b). At vocational college, the number of full-time slots also increased, by 2,500 in 2020 (Ministry of Education and Research 2020).

Despite the increase in capacity, the large number of applications mean that competition for places has intensified. Among those who are applying to university or college, there are probably many young people who would normally not consider continued education, but who now find it more attractive. On average this group has lower upper-secondary-school grades and is theoretically close to the threshold when a university education becomes profitable. Within the group of students that just completed upper-secondary school, many begin their university studies earlier than anticipated. This group instead includes the most gifted students and they compete for the most attractive programmes. Since more young people overall opt for a post-secondary education, the average applicant might be somewhat less qualified (in terms of previous educational performance). But the fact that motivated and high-performing young people begin their studies earlier than planned may have the opposite effect and lead to an academically better prepared student body. How the qualifications of the student body develop when the number of applications go up will depend on the supply of slots, which programmes are in demand, and whether students apply to and accept offers from less popular programmes. Historically, there is a clear correlation between the business cycle and admission requirements: The Fiscal Policy Council (2010) has shown that the proportion of admitted students with "high grades" was positively correlated with unemployment between 1998–2008.[92] Similar results can be found in Öckert (2011) who showed that business-cycle related fluctuations in the number of admitted students are driven by the high-performing group, which means a more positively selected group of students at universities and colleges during economic crises. This pattern can be explained by high-performing students being more sensitive to economic cycles, and by higher admission requirements due to tougher competition.

Has the current crisis and the growing demand for education affected the degree of competition for university places? One measurement of the growing competition is that the number of applicants placed on waiting lists has

[92] The proportion of "high grades" is the proportion of students among those admitted on grades that have an average grade across all courses corresponding to 15 or higher, where Pass=10 points, Pass with Credit=15 points, Pass with Special Distinction=20 points.

increased: At first admission, the number of wait-listed students increased by 32 percent between the autumn term of 2019 and 2020 (Swedish Council for Higher Education 2020b). Most applicants opt for programmes where there is competition for places, and the share of programmes with competition increased somewhat between the autumn term of 2019 and 2020, from 21 to 24 percent. The share of admitted students among qualified applicants decreased from 78 to 75 percent between 2019 and 2020 (Swedish Council for Higher Education 2020b).

It is still too early to draw conclusions about whether abilities and motivation among admitted students have changed as a consequence of the ongoing crisis. If more students from low-educated families complete a post-secondary degree, social mobility between generations may increase. But admitting more young people with a weaker academic background also entails a risk of lower completion rates. This is a tangible risk, considering that a significant part of the teaching will be provided remotely which might affect the quality of education. But it is more probable that the student body will become more positively selected due to increased competition – this is at least the experience from previous crises that increased the demand for education.

Finally, it is interesting to reflect on the increasing interest in education within healthcare and social care (see Figure 5.2 and the National Agency for Education 2020). As demand for labour within this sector currently is high, it is only natural that many young people show an interest in these programmes. However, nursing training and medical school take several years to complete, and it is not evident that the high demand will persist when today's applicants graduate. Perhaps the increased number of applications to these programmes should instead be interpreted as a change of norms and preferences, and as a willingness to contribute to society in a moment of crisis.

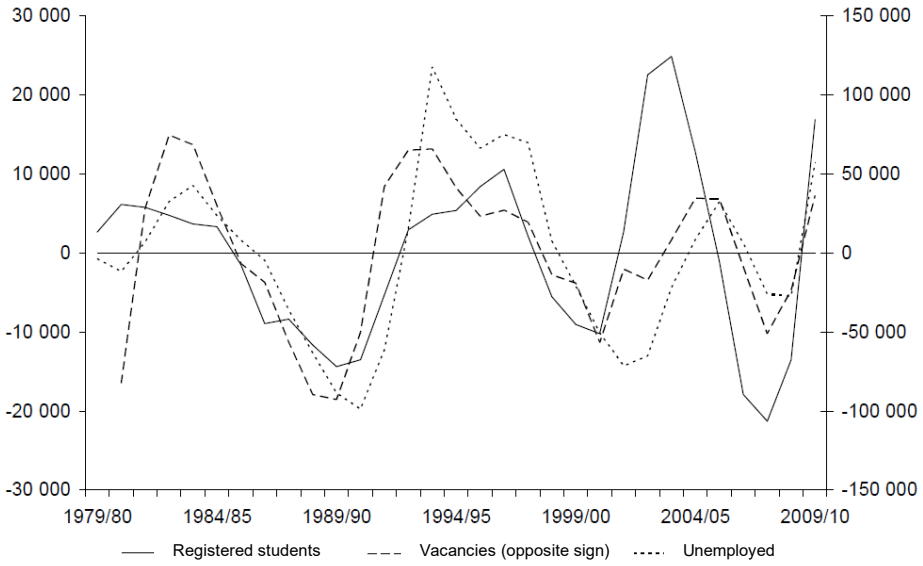
## 5.3 Research on economic crises and the demand for education

By studying historic links between business cycles and inflows into education, we can learn something about how the coronavirus pandemic is likely to impact young people's educational choices. In this section, we briefly summarise a number of studies on this topic, with a Swedish as well as an international perspective.[93]

[93] This section does not constitute a complete research overview, it only presents a selection of relevant studies within the field.

Figure 5.3 presents the number of registered students at Swedish universities and university colleges, the number of vacancies, and the number of unemployed in Sweden over a thirty-year period (the Fiscal Policy Council 2010). To clarify the correlation, the time series are presented as deviations from long-term trends, and the number of vacancies is presented with its opposite sign in order to facilitate interpretation. The figure shows that the number of students is above the trend (the zero baseline) during periods when the number of vacancies is low, and unemployment is high. The reverse is true for periods when the labour market is stronger and there are better chances of finding work. Historically we therefore find a clear correlation between business cycles and the number of young people who choose to enter higher education.

**Figure 5.3** The number of registered students, vacancies and unemployed, deviations from long-run trend




*Note:* The trend has been calculated using a Hodrick-Prescott filter. Registered students and vacancies on left axis, unemployed on right axis. Unemployed and vacancies refer to the same calendar year as the fall term of the academic year. Vacancies are shown with reversed sign.
*Source:* Statistics Sweden and Swedish Public Employment Services.

*Source:* The Fiscal Policy Council 2010.

Similar correlations were also studied in Fredriksson (1997), who investigated how different types of financial incentives affect the demand for higher education in Sweden. Using a time series analysis covering the period 1967–91, the study investigates how the wage premium for a university education and

youth unemployment affect the inflow to higher education. The wage premium turns out to be the most important factor explaining fluctuations in the inflow to higher education, but youth unemployment also contributes significantly to explaining the demand for a university education.

The correlation between youth unemployment and demand for education can also be calculated at the regional level, to investigate how young people's education decisions are affected by the local labour market where they live. Such models take into account that national unemployment trends, general regional differences in young people's demand for education, and the conditions in the local labour market may give rise to misleading correlations. The method makes use of the fact that unemployment at the local level varies from year to year and measures the correlation between these local fluctuations and young people's educational outcomes.

From a Swedish perspective, studies from Denmark (Sievertsen 2016) and Norway (Reiling and Strøm 2015) are of particular interest. Sievertsen (2016) studied young people who had just graduated from upper-secondary school and investigated how the local youth unemployment rate among young people with at most an upper-secondary-school education affected both the demand for post-secondary level education, and the probability of completing such an education. The results showed that higher youth unemployment in the local labour market increased the probability of young people continuing to study; a one percentage point increase in youth unemployment leads to an increase in the probability of enrolling in post-secondary education by 0.5 percentage points. Furthermore, Sievertsen (2016) showed that higher youth unemployment leads to more people completing their post-secondary education. However, this effect is not explained by more young people opting for university, but by vocational training after upper-secondary school. The sensitivity to economic cycles is stronger among young people with parents who have a low level of education, i.e. the group which enrols in post-secondary education to a lesser extent.

Reiling and Strøm (2015) studied how unemployment in local labour markets in Norway affects the probability of beginning and completing an upper-secondary school education. The unemployment rate was measured at the point in time when young people graduated from compulsory school. The study found that unemployment does not affect the inflow to upper-secondary school, which is probably due to the fact that most young people go to upper-secondary school, irrespective of the economic situation. But unemployment does affect the probability of young people completing upper-secondary school within five years. When unemployment rises by one percentage point, it is estimated that the probability of completing upper-secondary school increases by 0.9 percentage

points. The effect is driven exclusively by pupils completing vocational programmes to a greater extent. Youth who attend academic upper-secondary school programmes are unaffected by the unemployment rate at the time of graduation from compulsory school, which likely is explained by the fact that they often plan to continue to university irrespective of the economic situation.

There are also similar analyses based on data from the US and the UK. Card and Lemieux (2001) studied the correlation between unemployment and participation in education at the state level in the US. The unemployment rate is measured as a share of the working age-population and does not specifically reflect the risk of unemployment among young people. The results showed that unemployment increases the probability of young people attending upper-secondary school, and also of graduating, but there is no correlation between unemployment and the probability of young people attending college. One possible explanation for this result is that unemployment among parents resulted in fewer families being able to afford to pay the college tuition fees, which reduces demand. Clark (2011) investigated the correlation between youth unemployment and the proportion of 16-year-olds who continue on to upper-secondary school after graduating from compulsory school in the UK. The study found that youth unemployment has a clear effect on the probability of continuing education, and that rising unemployment is a quantitatively important explanatory factor behind an increasing demand for education.

In the literature, there is wide support for the notion that demand for education (in accordance with the predictions) is counter-cyclical. Sievertsen (2016) summarizes a number of studies within the field, and all studies but one indicate that demand for education increases when unemployment rises (or with other indicators of economic downturns). Furthermore, several studies show that the demand among men is more sensitive to economic fluctuations than that of women.

Research on the correlation between economic crises and educational choice is not limited to the choice of level of education, but also studies the choice of educational field. Several studies from the US show that students' choice of degree varies with the business cycle (see e.g. Liu et al. 2019; Ersoy 2020; Blom et al. 2020, Weinstein 2020). Ersoy (2020) studied the choice of college majors around the Great Recession in the US in 2008, and found that in states that were more severely hit by the crisis, students to a greater extent chose fields that were less sensitive to economic fluctuations in terms of wages, employment and unemployment, compared to students in states that were less severely impacted. Similar results can be found in Blom et al. (2020), who found that higher unemployment implies that students more often choose majors with higher

expected incomes and which quickly lead to employment, particularly within the industry that is relevant for the field.

To sum up, there is an extensive empirical literature which, in line with Becker's human capital theory (Becker 1964), shows that young people's educational choices are linked to variations in economic incentives that arise as a consequence of business cycles.

## 5.4 Concluding discussion

The coronavirus pandemic implies a great challenge for the generation of young people that has graduated from upper-secondary school in the past few years. Young people are particularly vulnerable to rising unemployment, and the industries which offer entry-type jobs have been hit hard by the current crisis which further worsens the labour market prospects for the young. The opportunities for young people to take a gap year to travel or to study abroad are limited. For that reason, more young people are applying to higher education in Sweden compared to a year ago – in part because they choose to begin their studies earlier than anticipated and in part because they decide to study instead of entering the labour market. The number of places in educational institutions have increased in order to satisfy the growing demand for education. Education can be an efficient policy for protecting young people from the long-term negative consequences of economic crises, in particular if it encourages young people to opt for professions where there are labour shortages. However, it is important that young people realize that in the long run, an increased supply of highly educated workers may reduce the return on investing in a university education.

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# 6 Youth labour market entry and economic downturns

**Mattias Engdahl**

The COVID-19 crisis has had a dramatic impact on the Swedish labour market. The fall in GDP in the second quarter of 2020 was the largest in 40 years, and the number of hours worked in the economy fell sharply (Konjunkturinstitutet 2020). Unemployment among 15–24-year olds rose from 20.1 percent to 27.7 percent between February, the month before the spread of the coronavirus took off in Sweden, and June 2020, when it started to decline. This increase is considerably steeper than the corresponding increase for the older part of the population. More young people are also inactive; the proportion who are Not in Employment, Education or Training (the co-called NEET) has increased from 7.3 percent in the third quarter of 2019 to 9.3 in the same quarter of 2020 (Statistics Sweden 2020).[94] This is not surprising, as what normally happens in a financial crisis is that recent employees, those on hourly contracts, and temporary employees are among the first to be laid off (Nordström Skans 2020), and we know that young people often have these type of contracts. Those who have not yet found a first job before a crisis hits will also find it more difficult to find any job at all. The fact that the restrictions that were imposed to curb the spread of the coronavirus have also severely impacted the service sector, makes the situation even more problematic. Part of the service sector, including hotels and restaurants, have been hit hard, which impacts young people as many first-time jobs can be found in these very sectors (Engdahl and Forslund 2016). Another factor that indicates that the crisis will impact young people relatively hard is that the many of the Swedish government's financial rescue packages (such as short-time work schemes) that were introduced at the initial stages of the crisis protect permanent but not temporary employees.

It is evident that the crisis has led to a direct loss of income for young people who had not found a job when transitioning from education to work, or who lost their job. But does this mean that there are reasons to be concerned about what will happen in the long run? After all, most young people do find jobs, even

[94] After a partial recovery during autumn 2020, forecasts indicate that the situation in the labour market will deteriorate further; employment is likely to fall and unemployment will continue to rise during spring 2021 (Arbetsförmedlingen 2020).

though it may take longer. The likely answer is that there are reasons to be concerned. Comprehensive international and Swedish research shows that temporary economic downturns impact those who enter the labour market in the downturn for a considerable period afterwards.

In this chapter, I will sum up the main arguments from the research literature concerning economic downturns and young people's labour market entry. I will also discuss explanations as to why the economic situation when entering the labour market may affect young people also in the long run. In conclusion, I will attempt to highlight how the body of knowledge from previous research helps us understand what is to expect from the COVID-19 crisis.

## 6.1 Reasons why recessions can have long-term effects

What might explain why young people who enter the labour market in a recession have worse labour market outcomes than young people who enter the labour market during an economic upturn, even in the longer term? The economic research literature presents several theoretical models that provide valuable insights on the matter.

A first theoretical explanation concerns how young people's opportunities for developing skills and know-how (so called human capital) is affected by recessions. In an economic downturn, the probability of young people becoming unemployed increases, and being unemployed limits the opportunities to accumulate human capital (Nordström Skans 2011). It may also be difficult for job seekers to maintain the knowledge they already possess (Edin and Gustavsson 2008; Gregg and Tominey 2005). Lacking employment leads to young people losing both the opportunity to accumulate general skills that is useful in the labour market as a whole, as well as firm-specific human capital. Thus, it is more likely that young people, if they enter the labour market during a recession, get jobs that involve less qualified tasks, or jobs in industries for which they have not been trained, or that pay less (Gregg and Tominey 2005). What does this mean in the long term? A standard assumption in the theoretical literature is that the returns to experience is diminishing (Oreopoulos et al. 2012). This means that those who were previously unemployed, perhaps having been away from the labour market for a year or two, over time may catch up with more "fortunate" young people who entered the labour market during an upturn. However, if a recession instead leads to young people on average getting jobs with more limited career opportunities, or jobs with fewer opportunities for accumulating human capital, it is possible that they will never catch up with their more "lucky" counterparts (Oreopoulos et al. 2012).

Another explanation is that unemployment can affect young people's general satisfaction and health (Clark et al. 2001; Knabe & Rätzel 2011), and possibly, thereby, also their job-seeking behaviour (Clark et al. 2001).[95] If unemployment becomes the norm, the motivation to apply for jobs may diminish, which means that it will take longer to gain a foothold in the labour market, or that young people may stop looking for jobs entirely. Jobseekers could also be affected by their surroundings. Clark (2003) showed that job-seeking behaviour is affected by social norms, and that the job-seeking behaviour of unemployed people is impacted if many people around them are also unemployed. A high level of unemployment was shown to lower the intensity of job search.

A third explanation is based on the fact that employers rarely have complete information about the productivity of jobseekers. Previous unemployment spells can be perceived by employers as a signal of lower motivation or productivity (Nordström Skans 2011).[96] Unemployed applicants are potentially rejected, as the uncertainty about their productivity is higher than for comparable individuals who were not unemployed, or who have a more limited history of unemployment, indifferent of whether the jobseeker became unemployed due to the economic downturn or because of low productivity. This means that, on average, it will take longer for employers to obtain an accurate impression of young people's productivity if they enter the labour market during a crisis. For this reason it may take time to catch up with those who enter the labour market in better times (Oreopoulos et al. 2012). Unlike the explanation that is based on unemployment leading to limited (or no) opportunities to develop human capital, this explanation means that an economic downturn can have negative consequences irrespective of the skills and know-how possessed by the job applicant.

A fourth explanation is that young people who enter the labour market in a recession get jobs at less productive firms or jobs that do not match the employee's qualifications (so-called "mismatch"). Gregg and Tominey (2005) discusses a theoretical model that is based on firms with lower productivity being more inclined to recruit unemployed people compared to firms with higher productivity. More productive firms primarily recruit employees from other firms. Consequently, the loss of a job will increase the probability of the employee being employed at a lower-quality firm that pay lower wages and, possibly also, offer more limited career opportunities (Oreopoulos et al. 2012;

[95] Unemployment can also cause depression and impact health later in life (see e.g. Schwandt and von Wachter 2019a; Maclean 2013).
[96] Several large-scale experiments have been conducted showing that employers have an aversion to employing unemployed people. See e.g. Eriksson and Rooth (2014), and Kroft et al. (2013).

Kahn 2010). This explanation is suggestive of even temporary recessions leading to young people being forced to undergo a sometimes long job search process in order to find more qualified/better paid jobs to repair the "damage" caused by mismatch, or the applicant being employed by a less productive firm (Oreopoulos et al. 2012). As applying for jobs is costly, and as the cost is often assumed to increase with age, for example because having a family makes it more difficult to move, this means that it is by no means certain that all young people will catch up with those who enter the labour market in better times. Furthermore, the fact that young people who enter the labour market have spent more time in jobs for which they were not trained, also means that there is a risk that they have accumulated the "wrong" type of human capital, i.e. human capital that is not favourable to their long-term careers (Kahn 2010).

A fifth explanatory model shows that stickiness in wage-setting processes may mean that it will take time to catch up with employees who entered the labour market during an economic boom. The basis is that the current economic situation will affect wage setting; if new employees in an economic downturn are paid a lower starting wage than would have been the case in better economic times, this may have consequences, as it can be difficult for employees to negotiate a higher wage when the economy improves again (Oreopoulos et al. 2012).

A sixth mechanism is that there are labour market institutions that, from a theoretical perspective, unambiguously disadvantage those who are unemployed. Examples include strict employment protection legislation, high minimum wages and collective agreements (Nordström Skans 2011; Engdahl and Forslund 2016; Kawaguchi and Murao 2014). These types of regulations protect those already employed, while creating entry barriers for those searching for a job.

Finally, a financial crisis means that potentially valuable contacts lose relevance. If a contact (such as a parent) in a workplace becomes unemployed, or if firms where young people worked while studying close down, the opportunity for using these contacts when applying for jobs will vanish. As informal channels for job applicants are important to young people, and young people as a rule have limited networks, this is a contributing factor to prolonging the time it takes to find a job during a crisis (Hensvik, Müller and Nordström Skans 2017 and Müller 2020).

Overall, the discussion in this section shows that there are several theoretical explanations to recessions having long-term effects.

## 6.2 Findings from previous research

Research from a large number of countries shows how youths are affected by the economic situation at the time of labour market entry. In addition, there are studies showing that experience of unemployment early in the career has negative consequences.[97] All studies indicate that the labour market situation or unemployment at the time of transitioning from education to work, plays an important role in how young people fare in their working life over an extended period of time. There is also limited research that indicates that the labour market's organisational structure affects how long the effects of a crisis persist. In the following sections I will summarize these literatures.[98]

### 6.2.1 Effects of unemployment

Studies from several countries have shown that a period of unemployment in association with starting working life may lead to future negative labour market outcomes (Nordström Skans 2011; Gregg and Tominey 2005; Gregory and Jukes 2001; Krahn et al. 2012; Mroz and Savage 2006). Nordström Skans (2011) investigated the effect of becoming unemployed in connection with the financial crisis in the 1990s, for young people who graduated from upper-secondary vocational school. The comparison group comprised of siblings. The effect of becoming unemployed was negative, but no longer statistically significant 6 years later. Similar results can be seen in research from the US. Mroz and Savage (2006), who studied men aged 14–19 in 1979, showed that the effect of having been unemployed in association with labour market entry persisted for 4 years, following the end of the period of unemployment. Several studies from the United Kingdom (UK) are also worth mentioning. Gregg (2001), who focuses on young males born at the end of the 1950s, found that unemployment in association with their labour market entry led to an elevated risk of becoming unemployed when they were between 28 and 33 years of age. There is also evidence showing that the effects of unemployment could be more negative for

[97] There are also many studies highlighting the effects of losing a job. This literature focuses on individuals that are already established in the labour market which means that the insights are more limited in this context. See e.g. Davis and von Wachter (2011), Eliasson and Storrie (2006) and Couch and Placzek (2010) for important contributions.

[98] This overview is not fully comprehensive. I limit the discussion to studies that concern effects on labour market outcomes, such as employment and earned income, and discuss some, but not all, of the major contributions in the research literature. There is also a growing body of literature, which is very interesting, on how financial crises affect the choice to start a family (see overview of Kondo (2016) or e.g. Hofmann and Hohmeyer (2016) and Kondo (2012)). I also disregard the literature that assesses effects of crises or unemployment on future health (see for example Schwandt and van Wachter (2019b); Maclean (2013) and Eliasson and Storrie (2009)).

young people with relatively low levels of education (Burgess et al. 2003).[99] Another study from the UK, focusing on men who entered the labour market in the 1990s, also showed that the first time an individual becomes unemployed has the most negative impact on future labour market outcomes (Arulampalam 2001). Repeated spells of unemployment turned out to be less significant.

Overall, the results from several studies indicate that periods of unemployment early in a person's working life can affect the labour market situation for a relatively long period of time, but that the effects are not likely to be permanent.

### 6.2.2 Effects of recessions

Far from everybody who enters the labour market during a recession will experience unemployment. In section 1.1, I discussed a number of mechanisms that may explain why young people may be affected by the economic situation, irrespective of whether they become unemployed or not. This is the basis of the literature I am summarising in this section, where the overarching research question is whether young people, in the short and long term respectively, are affected by entering the labour market during recessions.

Studies from several countries contribute to the body of knowledge, but the methodological approach is more or less the same. The studies use economic fluctuations over time in order to study the effects of the prevailing economic situation at the time of young people's labour market entry, for example by comparing labour market outcomes for young people who graduated from upper-secondary school during different phases of the business cycle. An appealing aspect of these studies is that birth cohorts that completed their education during more favourable economic times are an appropriate control group for age groups that graduated in less favourable economic conditions, the argument being that there should not be any systematic differences in terms of background and other circumstances between adjacent cohorts.[100]

Many of the reviewed studies focus on men, which is unfortunate as it excludes half the population. There has also been a greater focus on the highly educated. However, over time it has become more common to also focus on women, minority groups, and individuals with lower levels of education (see for example Schwandt and van Wachter 2019a; Hershbein 2012; Kondo 2015).

[99] Burgess et al. (2003) used labour market surveys conducted in UK from 1981–1997 and included both men and women in his analysis.
[100] In practice, most studies compare labour market entrants in different regional labour markets that had different unemployment rates.

There are indications that the effects differ between people with higher and people with lower levels of education, respectively. I will continue by presenting research results concerning these two groups in order.

### 6.2.3 Impact on graduates of higher education

Research from the US (Altonji et al. 2016; Genda et al. 2010; Kahn 2010; Schwandt and van Wachter 2019b), Canada (Oreopoulos 2012), Norway (Liu et al. 2016), Japan (Genda et al. 2010) and Belgium (Cockx and Ghirelli 2016) shows that young people leaving university or college were adversely affected by recessions in association with graduation.

The results from several North American studies make it clear that the economic situation affected university students for up to 10 years or more, following graduation (Oreopoulos 2012; Kahn 2010; Altonji et al. 2016). Kahn (2010) studied (white) men in the US who graduated from a college or university between 1979 and 1989 and showed that an increase in unemployment by 1 percentage point led to 6–7 percent lower wages in the short term. The effect diminished over time but remained 15 years later (when the follow-up period ended). Labour earnings for men was also adversely affected in Canada (Oreopoulos et al. 2012). Oreopoulos et al. (2012) studied students who graduated from university between 1976 and 1999, and showed that the recovery was gradual, but that their earned income remained low for up to 10 years following graduation. Altonji et al. (2016), whose focus was on women and men who graduated college or university in the US between 1974 and 2011, found a similar pattern. The researchers also investigated why labour earnings was reduced. A combination of increased part-time work and lower wages can explain the effects. Part-time work had the greatest explanatory value for the first few years following graduation; subsequently, the result is mainly explained by lower wages.[101]

A Norwegian study focusing on students who graduated between 1988 and 2003 showed that labour market entry during the recession in the 1990s led to lower earned income for the first four years in the labour market (Liu et al. 2016). In comparison with the studies from the US and Canada, the effects diminished more quickly. A closer analysis shows that this is because a relatively large proportion of youths in Norway worked within the public sector, which was less affected by economic fluctuations than the private sector.[102]

[101] Schwandt and van Wachter (2019a) and Genda et al. (2010) found similar patterns for college graduates in the US and Japan (Genda et al. 2010).

[102] Within the private sector, it took approximately 8 years for employees to catch up with those who entered the labour market when the economy was buoyant, which is reminiscent of the results from the North American studies discussed in this section.

Cockx and Ghirelli (2016) studied young men in Belgium who graduated in the late seventies and early eighties, and found that rising unemployment in association with labour market entry had long-term effects; after 12 years (when the follow-up period ended), negative effects on earned income and wages still persisted.

There are also research results from Canada and the US which indicate that the effects may differ depending on the field of study at university (Oreopoulos et al. 2012; Altonji et al. 2016). Students in the US who completed an education with high expected return in the labour market were less affected than students who completed an education with lower expected return (Altonji et al. 2016).[103]

Interestingly, empirical support is found for several of the theoretical mechanisms discussed in section 1.1. Oreopoulos (2012) showed that young men in Canada who graduated when unemployment was high, to a greater extent than men who graduated when unemployment was lower, worked for smaller firms which paid relatively low wages. Students who entered the labour market in less favourable economic periods were partly able to catch up with those who entered the labour market under more favourable conditions because, over time, they switched to more well-paid jobs.

Research from Norway shows that the degree of mismatch rose when unemployment was high during the 1990s, in the sense that the proportion of young people who had jobs that did not correspond to their field of study increased (Liu et al. 2016). There is also support in American research for recessions leading to young employees entering less qualified professions (Altonji et.al. 2016; Kahn 2010). In addition, a Swedish study showed that young people who entered the labour market in the seventies and eighties found jobs that led to more limited career opportunities when the economy declined. The probability of promotion was lower for this group (Kwon et al. 2010).[104]

Overall, the overview shows that there is strong support in the research for young people graduating from university or college being adversely affected by recessions at the time of graduation, and that the effects may persist for up to 10 years or more.

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[103] The choice to continue to study can naturally also be affected by the possibilities of gaining entry to the labour market. Two American studies found support for high unemployment at the time of university graduation resulting in more students choosing to go into post-graduate research (Altonji et al. 2016; Kahn 2010). See also chapter5 in this report for a more general discussion of recessions and the demand for education.

[104] The conclusion is valid even after taking into account the characteristics of the firm. Thus, the results indicate that it is better to commence employment at a "bad" workplace in an economic boom than in a recession, as it will entail greater opportunities for promotion.

### 6.2.4 Impact on young people with lower levels of education

The number of studies that focus on how the economic situation affects labour market entry for those who graduate from upper-secondary school, or those who drop-out of school, is more limited. Partly, this can probably be explained by the fact that the path forward for this group is more difficult to define. Some young people continue to higher education, others look for work immediately, while a third group will work for a certain period and start studying later. However, research from the US (Schwandt and van Wachter 2019a; Hershbein 2012; Speer 2016; Genda et al. 2010), Belgium (Cockx and Ghirelli 2016), Austria (Brunner and Kuhn 2014), Norway (Raaum and Roed 2006) and Japan (Genda et al. 2010) shows that young people without higher education, just like young people with longer education, were adversely affected by recessions in association with graduation.

Two studies from the US, where effects were assessed for both groups (although men only), showed that the effects in *the short term* tended to be greater for people with a lower level of education compared to people with higher education (Genda et al. 2010; Speer 2016). Speer (2016), who studied American men with 9–12 years of education who left school between 1979 and 1998, argued that it may be plausible that the initial effects are greater for people with a lower level of education, as a crisis frequently causes unemployment to rise more sharply for this group. It is also emphasised that people with a low level of education have been proven to have less geographic mobility, which could mean that they are more sensitive to economic shocks. Schwandt and van Wachter (2019b) who studied both low-skilled and high-skilled people in the US, who graduated between 1976 and 2015, investigated in more detail the role that educational background plays for youths in the US. The researchers showed that those who dropped out of high school were more severely impacted in the short run than graduates from upper secondary school or higher education. The evidence in this study is in line with the studies just discussed. The study also showed that there are no significant differences between women and men.

In an interesting study of high school students who left school in 1975 and 1983, Hershbein (2012) showed that women in the US worked less for the first few years following labour market entry if unemployment was high at the time of graduation. This cannot be explained by them entering higher education to a greater extent than men, or that women left the labour market to start a family. It has not been made clear what was behind the gender differences. However, research from Sweden and other countries points to family formation as a possible mechanism. Women who left upper-secondary vocational school in Sweden during the financial crisis in the 1990s started families earlier than

women who entered the labour market just before the crisis (Engdahl, Godard and Nordström Skans 2018).[105]

The question concerning how long young people with relatively short education will be affected by a crisis, compared to more highly educated, is somewhat more difficult to answer, even though there are several studies providing a unanimous answer. An American study that includes young people who graduated between 1976 and 2015 shows that labour earnings remained lower for students that graduated during a recession in comparison with students entering the labour market at "better" times (Schwandt and van Wachter 2019b). The reported results are comparable to findings for people with a higher education, although they are somewhat less persistent (Oreopoulos et al. 2012; Kahn 2010). Similar patterns have been demonstrated for people with lower levels of education in Belgium (Cockx and Ghirelli 2016), and for young people with blue-collar jobs in Austria (Brunner and Kuhn 2013). The European studies, however, indicate that the effects could persist even longer. Cockx and Ghirelli (2016) for example, showed that Belgian men who graduated in the late seventies and early eighties were still, 12 years after graduation, affected by the unemployment level at the time of labour market entry. The Austrian study showed that high unemployment at labour market entry for men in blue-collar jobs led to lower wages up to 20 years later (when the follow-up period ended) (Brunner and Kuhn 2014). A Norwegian study focusing on men and women born between 1961 and 1974 showed that unemployment at the time when the study population were between 16 and 19 years of age still affected the group when they were approaching 40 years of age (Raaum and Roed 2006). A certain proportion of those impacted had then left the labour force, because of the high unemployment at the time of entry into the labour market.

However, there are at least two studies which indicate that the adverse effects could be more limited. Both studies are American and indicate that the effects of graduating in a recession diminished as soon as within 1–2 years after graduation (Genda et al. 2010; Speer 2016).[106] Speer (2016), who studied outcomes for men who graduated between 1979 and 1998, argues that it may be plausible that the effects for people with a low level of education are short-lived, as workers belonging to this group often is unable to switch to less qualified jobs; instead they become, to a larger extent, unemployed. This indicates that the path back to the labour market could be shorter; when the economy recovers the probability

[105] Also see the overview by Kondo (2016), which discusses several of the available studies on financial crises and family formation.

[106] Both studies used data from the NLSY79 (the National Longitudinal Survey of Youth's 1979 cohort) which comprises approximately 13,000 individuals between 14 and 22 years of age in 1979, a selection that is considerably more limited than the study populations in most other studies.

of low-qualified workers finding jobs similar to the jobs they previously held increases. This differs from the findings in research concerning more highly educated, which indicates that crises can lead to graduates taking less qualified jobs than they normally would have done, and that the slow recovery after a crisis partly is due to the fact that it takes time to advance their careers (section 1.2.3).

Overall, this section shows that there is also support in the research for young people with a short education being adversely affected by economic downturns. How long the effects persist has not been made entirely clear. It is worth reiterating that there are fewer studies focusing on young people with relatively short education than there are for people with a higher education. Although most of the more recent contributions provide evidence of long-lasting effects for this group, more research is required to give a more definite answer to the question.

### 6.2.5 How the labour market is organised is probably of significance

Several institutional factors such as the unionization rate, labour law (e.g. minimum wages and employment security), unemployment insurance, as well as the existence of active labour market policies and the opportunities for further education and training may have an impact on how the labour market operates.[107] One factor that has received particular attention in connection with young people's labour market situation is seniority rules that protects more experienced workers from dismissals. The research indicates that comprehensive employment protection for people with longer tenure tends to reduce turnover in labour market. Both the number of job terminations and new hires tend to be lower in labour markets with stricter employment protection, but the overall impact on employment and productivity is not clear. However, if employers are more restrictive about hiring new employees, it will impact those who do not have a foothold in the labour market, e.g. young people. Furthermore, if it is expensive or difficult to lay off staff, employers have a greater incentive to scrutinise applicants more carefully before employing them, which makes it particularly difficult for applicants with no or limited qualifications to find work. These types of factors will probably affect how extensive and, above all, persistent the effects of a financial crisis will be. In countries with more "rigid" institutions we would thus expect more long-term effects from crises (Kawaguchi and Murao 2014; Cockx 2016).

A small number of studies indicate that country-specific differences in institutions may be significant. Both the OECD (2013) and independent researchers (Kawaguchi and Murao 2014) have presented index calculations that aim to describe how strict the labour legislation is in various countries. This is

[107] See Kahn (2010), Skedinger (2010), OECD (2013) and Holmlund (2013) for overviews.

difficult to measure however, both because the term is multi-faceted and because relevant legislation, as well as court practice and procedure, change over time. For this reason, it is difficult to say exactly how strict the statutory employment security is in Sweden for example, relative to other comparable countries. With this caveat in mind, it is still worth mentioning a comparative study of 20 OECD countries from 1960–2010 (Kawaguchi and Murao 2014). According to the measurement used, Sweden has a relatively rigid labour market, and the analysis shows that recessions had more long-term effects on these types of labour markets.[108]

## 6.3 Concluding discussion

The COVID-19 crisis is having a major adverse impact on the Swedish labour market. Youth unemployment rose sharply after the start of the crisis, and there are more young people today who are neither in employment, education or training compared to before. The fact that the crisis is having a more severe impact on industries where young people often begin their careers, such as the hotel and restaurant industry, as well as parts of the retail sector indicates that the crisis may add to the difficulties young people face when trying to gain a foothold in the labour market.

The questions posed in the beginning of this section was whether the COVID-19 crisis will create problems in the long term for young people in the labour market? The review of the international and Swedish research literature provides a clear indication: youths who enter the labour market during recessions are often adversely impacted in the long term as well. There is solid support in the research literature for young people graduating from university or college in a recession having a weaker position in the labour market than young people who graduated when the economy was stronger, also in the long term. The negative effects may persist for up to 10 years or more, following graduation. Previous research also shows that young people with lower levels of education is likely to be adversely affected by economic downturns for an extended period of time. It is also clear that periods of unemployment early in a person's working life can affect the labour market situation for a relatively long period of time, but that the effects are not likely to be permanent.

In summary, the research shows that there is every reason to believe that the COVID-19 crisis will create difficulties for young people in the labour market in Sweden for a considerable time to come.

[108] For a more extensive discussion on this topic see Kondo (2016).

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# 7 What can previous evidence tell us about the consequences of the COVID-19 pandemic for children and youth?

**Anna Sjögren**

Based on previous research, available statistics and current information about the pandemic, we have analysed and discussed the consequences of the initial phase of the COVID-19 pandemic, the period from March to December 2020, for children and youth in the short and longer term. Although it is far too early to settle the accounts of the pandemic, some conclusions are warranted at this early stage:

- Children and youth in families with lower socioeconomic status and from disadvantaged communities run a greater risk than others of being adversely affected by the pandemic.
- The pandemic did not result in clear negative health effects in utero for babies born up until November 2020. Severe COVID-19 infections are also still rare for children and youth. Yet, it is too early to assess potential negative long-term consequences.
- Families with small children have been more severely affected by the ensuing labour market crisis than families with school age children. Yet there has been no increase in the number of families receiving means tested social assistance.
- Absenteeism is estimated to have increased by almost 50 percent among children in childcare and pre-school, and by almost 70 percent among students in compulsory school during the first nine months of the pandemic. Absenteeism among teachers increased by almost 70 percent.
- The learning losses and consequences for future earnings from this increased absenteeism are minor for the average student, but effects are likely more severe for students with high levels of absenteeism or in schools that have been more affected by absenteeism. Nevertheless, the consequences for society, in terms of future production losses, are significant.
- The rapid transition to distance learning is likely to have negative effects on learning, in particular for academically weaker and disadvantaged

students. At the same time, it is better for students to receive instruction online than to have no instruction at all.

- The growing demand for higher education during the initial phase of the pandemic may lead to lower returns to education, if new students are less well prepared or motivated, or if the quality of the education declines. Expanding education can be an efficient policy for protecting young people from the long-term negative consequences of economic crises, in particular if it encourages young people to opt for professions where there are labour shortages.
- In 2020, the COVID-19 crisis has had a particularly severe impact on industries offering entry job. There is a risk of long-term negative consequences for future labour market outcomes for the generation of young people who enter the labour market during the pandemic.

It is still too early to fully assess the long-run consequences of the impact of the COVID-19 pandemic on the childhood environment, health and human capital development. Available statistics suggest that few children and parents have suffered directly from serious illness during the first nine months of the pandemic. Neither have birth outcomes of newborns deteriorated. Children exposed in utero to maternal infection and stress in the most sensitive first trimester of the pregnancy had, however, not yet been born as this report was finalized, in December 2020. Yet, there are signs of increased stress and anxiety among pregnant women, as well as among children and youth. There are also indications that more children have been exposed to conflicts in the family than previous years.

During 2020, unemployment increased among parents of young children and, in particular, among mothers, while parents of school children were less affected. The economic crisis and the rise in unemployment, however, did not lead to an increase in the number of families receiving means tested social assistance. It is possible that extended unemployment insurance coverage, more generous unemployment insurance benefits and the introduction of short-time work schemes contributed to protecting families financially; another possible explanation is that many of the families, who have been hit economically, own assets making then ineligible for means tested benefits. Our overall assessment is that there are reasons to believe that children in families with low socioeconomic status and in disadvantaged communities run a greater risk than others of being adversely impacted by the pandemic's short and long-term effects.

Based on several data sources, we estimate that child absence from pre-school increased by almost 50 percent during the first nine months of the pandemic, while student absenteeism in compulsory school increased by approximately 70 percent. At the same time, absenteeism among teachers increased by almost 70 percent. Using estimates from previous research, we quantify the consequences of the increased absenteeism at preschool and compulsory school. The calculations indicate small negative effects on the school performance for the average student, although some preschools, schools and groups of students have likely been hit harder. Therefore, we do not expect that absenteeism during the pandemic in 2020, in the long term, will significantly impact student grades or results in international student assessments. Although the learning losses due to increased absenteeism are negligible at the individual level, the consequences for society at large may be considerable because of the negative impacts on productivity and income in the long term. A rough estimate indicates that the value of the lost productivity due to increased absenteeism in preschool and compulsory school from March–December 2020 amounts to SEK 10 billion. The ultimate cost to society, however, depends on how absenteeism develops through the pandemic and on effectiveness of compensatory measures in alleviating learning losses.

The pandemic led to a rapid transition to distance learning for Sweden's upper-secondary-school and university students. Previous research shows that distance learning adversely affects student performance compared to on-site face-to-face instruction. These negative effects primarily affect students with lower ability and worse conditions for learning. This means that the pandemic will likely increase inequalities in education. At the same time, it is important to stress that distance learning is better than no instruction at all. Again, how students will eventually be affected depends on the continued impact of the pandemic on the education system, and how well educational institutions and students are able to compensate and make up for lost learning opportunities.

The COVID-19 pandemic has led more young adults to apply to higher education in 2020 compared to previous years: Some have advanced their plans to study because devoting a gap year to travel or other pursuits no longer works out; others decide to study because job prospects are too grim. The number of places in educational institutions were increased to meet the growing demand for education. This may be an effective policy to protect young adults from negative long-term effects of the crisis, particularly if it successfully encourages young adults to venture into occupations and industries with good prospects, and where there is high demand for labour. At the same time, there is a risk of lower returns to education if the new students are less well prepared and lack sufficient

motivation, if the quality of education programs deteriorate, and if the increases supply of university-educated workers is too high relative to the demand.

Youth unemployment rose sharply early on in the pandemic. In the autumn of 2020, there were more young adults who neither worked nor were enrolled in education (NEETs) than in previous years. The fact that the crisis has had a particularly severe impact on industries where young adults start their working life, such as the hospitality industry and parts of the retail industry, means that young adults are finding it more difficult to gain a foothold in the labour market. Research on the consequences of entering the labour market during a recession indicates long-run effects in the form of increased unemployment risk and lower earnings. This is the case both for graduates from upper-secondary school and for university graduates. There is thus every reason to believe that the COVID-19 crisis will create difficulties for adolescents and young adults in the labour market for a considerable time to come.

As has already been pointed out, it is still too early to draw firm conclusions about the long-term consequences of the COVID-19 pandemic for children and youth. We are, currently, still in the midst of the pandemic. If life was turned on end in the spring of 2020, many, in particular children and youth, have now adapted to a new normal, the permanence of which we do not yet know. Working on this report has made it evident that the availability of data on how the pandemic is affecting children, youth, and their families will be crucial for evaluating the consequences of the pandemic and learning from it. It is also essential that there is documentation on how society's institutions and services, such as healthcare, school and higher education, have adapted and changed to address the crisis. In education, the pandemic has exposed the urgent need for national registers of student absenteeism and prevalence of distance and remote education. The fact that national testing was cancelled in 2020 and 2021 also means that fundamental data on student performance will be lacking. This, of course, complicates the evaluation of the effects of the pandemic on student performance, school quality and equity. It will also have long-term adverse effects on the conditions for conducting research on the performance of the Swedish school system.

In light of this review of how the COVID-19 pandemic may affect various aspects of home and learning environment of children and youth, the overall conclusion is that the pandemic will likely have negative consequences for many children and young adults. The greatest risk of adverse impact can be found among disadvantaged children, with a low socioeconomic status and a poor social safety net. This means that the pandemic will likely increase the inequality in children's and young adult's circumstances. There are thus reasons to closely

monitor the development and counter negative consequences for children and young adults, by safeguarding and developing institutions such as prenatal care, child health services and social services. The education system, from preschool to university and adult education, plays a central role in preparing, compensating and encouraging the COVID-19 generation of children and youth that is currently growing up to make up for any gaps in human capital development and lost opportunities caused by the pandemic.