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Adolescents' assessments of consequences of the pandemic after one year of COVID-19 restrictions

ORIGINAL ARTICLE

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BACKGROUND

We have obtained knowledge of how the COVID-19 pandemic affected the lives of adolescents immediately after the pandemic arrived in Norway. However, we know little about adolescents' experiences from the pandemic over time, and whether sociodemographic factors and infection rates at the municipality level play a role.

MATERIAL AND METHOD

We used questionnaire data from 106 448 lower and upper secondary school pupils who took part in the Ungdata survey in 167 municipalities in the spring of 2021 (response rate 76 %). The adolescents' responses regarding their experiences during the pandemic were collated with statistics on infection rates at the municipality level. We performed a Chi-square test and multilevel analyses to investigate predictors of adolescents' experiences.

RESULTS

A total of 49 % responded that the COVID-19 pandemic affected their lives in a partly or very negative direction. Many reported negative changes in peer relationships, family relationships and mental health, but some also reported positive changes. Girls, older adolescents, those with a low socioeconomic background and those living in municipalities with a higher prevalence of infection reported more negative consequences.

INTERPRETATION

Most adolescents reported that the pandemic has had more negative than positive consequences. Girls, older adolescents, those with a low socioeconomic background and those living in municipalities with a higher rate of infection may be especially affected by the negative effects of the pandemic.

Main findings

About one year after the COVID-19 pandemic hit Norway, 49 % of the adolescents indicated that the pandemic was having a negative impact on their life to some degree, while 22 % reported a positive effect.

Girls, older adolescents, and adolescents from families with a low socioeconomic status reported more negative consequences of the pandemic than other adolescents.

Adolescents from municipalities with a higher prevalence of infection reported more negative consequences of the pandemic, even after controlling for sociodemographic factors.

Due to the COVID-19 pandemic, children and adolescents in Norway have been living with severe restrictions for over a year, such as closed schools, extensive curtailments in leisure activities and less contact with their friends and peers. A recent report by the Coronavirus Commission states that the restrictions on social contact have been particularly difficult for children and adolescents (1). Research from the first phase of the pandemic, after the schools closed and social restrictions were implemented in the spring of 2020, has shown a substantive decline in quality of life among adolescents in Norway (2). It also shows that adolescents' lives have improved in some areas but worsened in others (3). However, we know little about adolescents' own perceptions of the situation during the pandemic over time, or how experiences vary according to sociodemographic factors and infection rates in the municipalities. To answer these questions, we use data collected from over 100 000 adolescents in the Ungdata survey in the spring of 2021, approximately one year after the pandemic hit Norway. We have a particular focus on adolescents' self-reporting of how peer relationships, family relationships and mental health have changed, as these have been highlighted as areas that may have been impacted by the pandemic (1, 3).

Contact with peers is important for adolescents' psychosocial development (4). Social distancing may therefore have a negative effect as it can reduce peer contact. In a survey conducted at the start of the pandemic among upper secondary school pupils, 28 % reported that they missed having physical contact with their peers (5). This indicates that social distancing is a challenge for many adolescents.

Layoffs and higher unemployment as a result of the pandemic may have led to more parental stress and thus more challenging family relationships. A study found that adolescents in Oslo reported an increase in family arguments, but many also reported that they were doing more fun things together as a family than before the pandemic (6).

One of the main concerns has been that the infection control restrictions are leading to mental health problems (1). Many have been concerned about their health and finances (7). Forbidding physical social contact can lead to isolation and loneliness (5), which in turn increases the risk of mental health problems (5, 8). Shutting down public services may also have led to vulnerable children and adolescents receiving less help (1). A Norwegian longitudinal study of adolescents found a slight increase in symptoms of anxiety and depression between February 2019 and June 2020, but the increase is presumed to be due to the ageing of the respondents between the surveys, and not the pandemic itself (9). However, the health and well-being survey of students shows that more people had mental health problems during the pandemic in 2021 compared with corresponding figures from 2018 (10). Whether the findings from the student surveys are transferable to adolescents is unclear, because students are older and their situation is different.

Although findings are mixed, we have some knowledge about the situation of adolescents at the start of the pandemic. However, we know little about the situation after one year or how adolescents themselves would describe the changes in different areas of their life. We also know little about variations across municipalities and whether the infection rate at the municipality level plays a role. We therefore posed the following questions: (1) How do adolescents themselves consider their peer relationships, family relationships and mental health to have changed during the

COVID-19 pandemic? (2) Are there differences depending on sex, age and socioeconomic status? (3) Is the prevalence of infection at the municipality level related to adolescents' reported changes in their life situation?

Material and method

The study is based on data from the Ungdata survey collected between 25 January and 27 May 2021. Adolescents from 167 municipalities from all counties except Agder and Nordland participated. All school years at most lower and upper secondary schools in these municipalities participated in the survey. The pupils answered an online questionnaire whilst physically present at school. A total of 135 829 pupils participated (76 % of all pupils in these municipalities), and 29 381 of these (22 %) did not respond to at least one of the questions. The 106 448 adolescents who answered all questions are included in the analyses. All participants and their parents/guardians received information about the purpose of the survey and were informed that participation was voluntary. The Ungdata survey is approved by the data protection officer at OsloMet and is recommended by the Norwegian Centre for Research Data. The study is not subject to approval by the Regional Committee for Medical and Health Research Ethics. The relatively high percentage with missing data was due to the questions about COVID-19 being placed quite far into the questionnaire and a number of respondents skipping some questions.

Variables

Overall impact of the pandemic

We devised questions specifically for this study about the adolescents' own overall impressions of the pandemic, because there were no validated instruments that could assess this issue. The adolescents were asked to assess whether the pandemic had affected their life in a negative or positive direction on a scale from one (No, not at all) to five (Yes, very much). See Figure 1 for the question formulation.

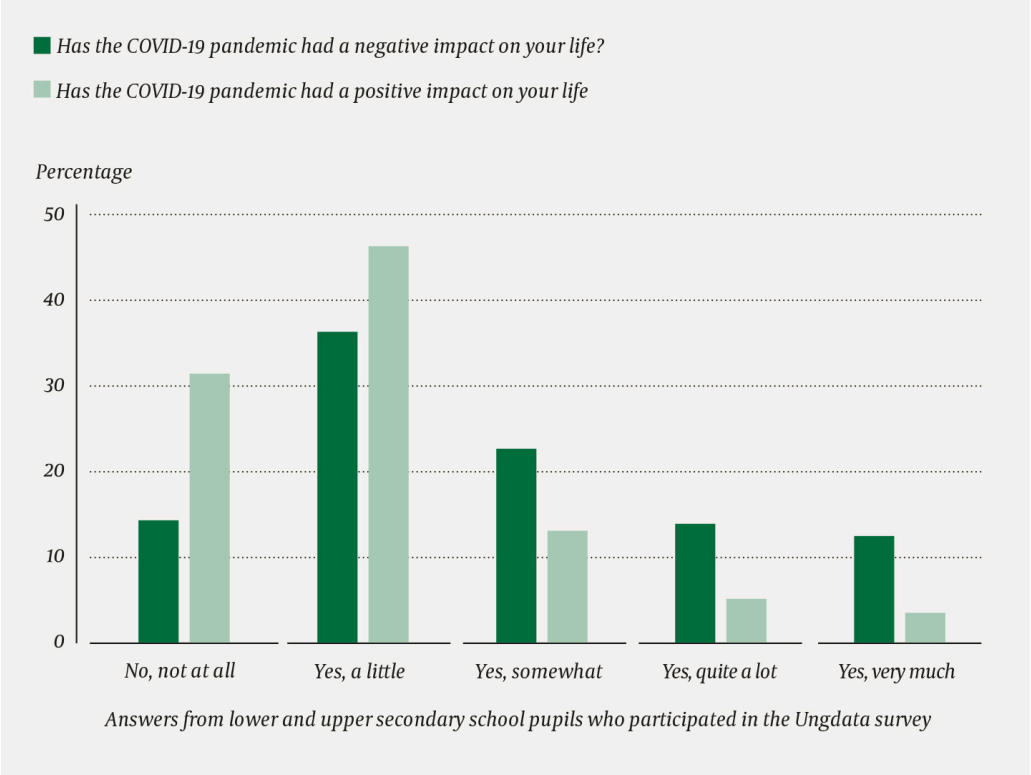

Figure 1 Answers from lower and upper secondary school pupils who participated in the Ungdata survey in the period 25 January 2021 to 27 May 2021 to questions about how the COVID-19 pandemic has affected their life over time (N = 106 448).

Before and during the pandemic

The adolescents were asked to rate their comparative experiences before and during the pandemic on a scale from one (Strongly disagree) to four (Strongly agree). We asked 'How do your experiences over a 12-month period in the COVID-19 pandemic compare to your pre-pandemic situation?'. This was followed by a series of items about changes in peer relationships, family relationships and mental health (see Table 1). Several of the items were formed by adapting existing instruments. For example, the item 'I felt more unhappy, sad or depressed than before' and 'I worried more than before' were taken from corresponding items about depressive symptoms from the Hopkins Symptom Checklist (11). We asked about both positive and negative changes.

Table 1

Responses from lower and upper secondary school pupils who participated in the Ungdata survey in the period 25 January 2021 to 27 May 2021 to statements about their comparative experiences before and during the COVID-19 pandemic (N = 106 448). The results are shown as a percentage.

	Strongly disagree	Agree slightly	Agree somewhat	Strongly agree
Relationships with peers				
I have had fewer friends to talk to than before the pandemic.	58	23	12	7
I have taken part in fewer leisure activities than before the pandemic.	30	24	22	25

	Strongly disagree	Agree slightly	Agree somewhat	Strongly agree
I have had less social contact with my classmates than before the pandemic.	30	30	22	17
I have felt lonelier than I did before the pandemic.	44	28	16	13
Relationships with parents				
There have been more family arguments than before the pandemic.	70	20	7	4
We have done more fun things together as a family than before the pandemic.	30	36	22	11
Mental health				
I have been more worried than I was before the pandemic.	37	34	19	10
I have felt more unhappy, sad or depressed than I was before the pandemic.	42	28	17	12
There has been less stress in my daily life than there was before the pandemic.	37	40	14	9

Prevalence of infection in the municipalities

Data on cases of infection were retrieved from the Norwegian Surveillance System for Communicable Diseases (MSIS), which contains information about all cases of COVID-19 reported by laboratories and diagnosticians (12). The data source includes weekly figures for registered cases of COVID-19 for all age groups per 100 000 inhabitants, up to 30 April 2021. We looked at the number of cases in the four weeks preceding the Ungdata survey and the total number of cases since the start of the pandemic. The number of cases in the preceding 14 days and the total number of cases since the pandemic started had a moderate to strong correlation ($r = 0.52$). The average prevalence of infection in participating municipalities over the entire period was 885 per 100 000 inhabitants.

Sociodemographic factors

Participants were asked to specify their sex and school year, and to respond to four questions about family resources. These four questions were taken from the Family Affluence Scale, which provides information about families' socioeconomic status (6), and were scored on a scale from 0 to 3. Respondents with scores of less than 2 were categorised in the group with a low socioeconomic status (9 % of the respondents).

Analyses

We used cross-tabulation to investigate whether pandemic experiences varied according to sex, school year or socioeconomic status, and performed a Chi-square test to measure significance. Due to the large number of participants, we chose a

significance level of p <0.001. Since the respondents were clustered within municipalities, we investigated whether the prevalence of infection played a role in adolescents' experiences of the COVID-19 pandemic by performing a multilevel logistic regression analysis, with the prevalence of infection as a continuous predictor variable. We also included a quadratic function to capture linear curve relationships, and we controlled for sex, school year, socioeconomic status, and in which week the respondents participated in the survey. We present results from logistic regression analyses graphically by showing the estimated percentage of adolescents who were impacted by the pandemic at different infection rates. Analyses of the preceding four weeks' prevalence of infection and total prevalence gave very similar results, and we have therefore chosen to present the total number of cases throughout the pandemic (up to 30 April 2021). We used the xtmixed command in STATA 16.1 for logistic regression analyses. Only respondents who had answered all variables were included in the analyses. To check whether missing data on the COVID-19 questions had an impact on the results, sensitivity analyses were performed in which participants who answered at least one COVID-19 question were included. The analyses showed only small differences compared to the main analysis (respondents who had answered all questions).

Results

A total of 49 % of the adolescents reported that the COVID-19 pandemic had affected their lives in a partly or very negative direction, while 22 % answered that the pandemic had a correspondingly positive effect (Figure 1). Table 1 shows that 19 % strongly agreed or agreed somewhat that they have had fewer friends to talk to than before the pandemic. Furthermore, 47 % and 39 % indicated that they had participated in fewer leisure activities and had less contact with their classmates. A total of 29 % reported that they felt lonelier. In terms of family relationships, 11 % strongly agreed or agreed somewhat that there had been more family arguments, and 33 % had done more fun things as a family. When it comes to mental health, just under 29 % strongly agreed or agreed somewhat that they had been more worried and more unhappy, sad or depressed, while 23 % reported lower daily stress levels than prior to the pandemic.

Table 2 shows that far more girls than boys reported negative consequences of the pandemic: 43 % of the boys responded that the COVID-19 pandemic had a negative impact on their lives to some degree, compared to 55 % of the girls. The gender gap was particularly wide for indicators of mental health, where the percentage of girls who reported negative changes was almost twice as high as for boys. In terms of positive consequences, the gender gap was smaller. Older adolescents regarded the consequences of the pandemic to be more negative and less positive than younger adolescents. Adolescents with a low socioeconomic status considered the consequences of the pandemic to be somewhat more negative than those with a higher socioeconomic background. One exception was that adolescents with a middle or high socioeconomic status were most negatively affected in terms of participation in leisure activities compared to before the pandemic.

Table 2

Responses from lower and upper secondary school pupils who participated in the Ungdata survey in the period 25 January 2021 to 27 May 2021 to statements about their experiences during the COVID-19 pandemic by sex, age, school year and socioeconomic status (N = 106 448). All results were significant at p <0.001 unless otherwise indicated. 'Vg' indicates school year at upper secondary level. The results are shown as a percentage.

	Sex		School year						Socioeconomic status	
(N)	Boys (51 3 36)	Girls (55 1 12)	Year 8 (20 3 06)	Year 9 (20 7 10)	Year 10 (21 0 18)	Vg1 (18 0 82)	Vg2 (15 5 98)	Vg3 (10 7 34)	Low (7 3 42)	High (99 1 06)
Overall impact of the COVID-19 pandemic[2]										
Negative impact	43	55	44	44	48	50	55	61	55	49
Positive iMac	22	21	23	24	24	21	18	18	23	22[1]
Relationships with peers[3]										
Had fewer friends to talk to	15	23	17	17	19	21	20	21	25	19
Took part in fewer leisure activities	43	50	42	44	47	47	50	56	44	47
Had less social contact with classmates	33	45	32	35	38	40	45	54	40[1]	39[1]
Felt lonelier	21	35	22	25	27	30	33	38	31	28
Relationships with parents										
More family arguments than before	7	14	10	11	11	11	12	12	16	11
Did more fun things as a family	31	36	39	36	33	31	29	29	33[1]	33[1]
Mental health[3]										

	Sex		School year						Socioeconomic status	
(N)	Boys (51 3 36)	Girls (55 1 12)	Year 8 (20 3 06)	Year 9 (20 7 10)	Year 10 (21 0 18)	Vg1 (18 0 82)	Vg2 (15 5 98)	Vg3 (10 7 34)	Low (7 3 42)	High (99 1 06)
Have been more worried	20	36	24	26	28	28	33	40	32	29
Felt more unhappy, sad or depressed	20	38	24	26	29	30	34	39	32	29
Less stress in daily life	24	22	26	26	24	22	20	19	23[1]	23[1]

[1]Does not give $p < 0.001$

[2]The percentage who answered ‘Yes’ to any degree.

[3]The percentage who answered ‘Agree somewhat’ or ‘Strongly agree’.

Figures 2 to 5 show the association between the prevalence of infection and adolescents' experiences during the pandemic. In terms of the overall assessment of negative and positive impacts of the pandemic, Figure 2 shows that the percentage of respondents who reported a negative impact was higher in municipalities with high infection rates, but that the correlation reached a ceiling at around 3000 cases per 100 000 inhabitants (cumulative figures from the start of the pandemic up to 30 April 2021). As infection rates increased, the percentage who experienced a positive impact declined. In terms of relationships with peers, Figure 3 shows a dose-response relationship, where the proportion of adolescents who reported participating in fewer leisure activities and less contact with classmates was significantly higher in municipalities with high infection rates. Correspondingly, higher infection rates were correlated with having fewer friends and feeling lonelier, but this association was weaker. With regard to family relations, Figure 4 shows that the proportion of those who did more fun things as a family was somewhat higher in municipalities with high infection rates, while there was virtually no association between the number of family arguments and infection rates. In terms of mental health, we found that the proportion who reported feeling worried or unhappy, sad or depressed was somewhat higher in municipalities with high infection rates, but the association seems to decrease with moderate infection rates (see Figure 5). There was also a slight tendency for municipalities with high infection rates to have a higher percentage who had experienced a reduction in everyday stress.

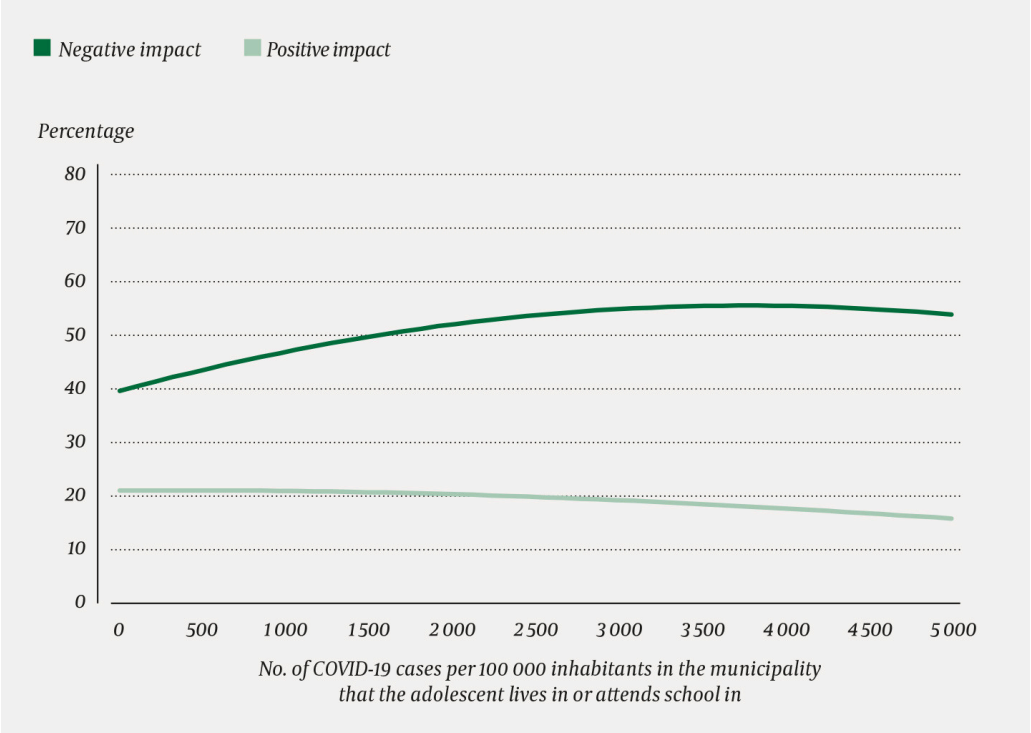

Figure 2 Infection rates in the municipality (cumulative cases throughout the pandemic up to 30 April 2021 per 100 000 inhabitants) and responses from adolescents' assessment of the overall negative and positive impasto of the pandemic (N = 106 448).

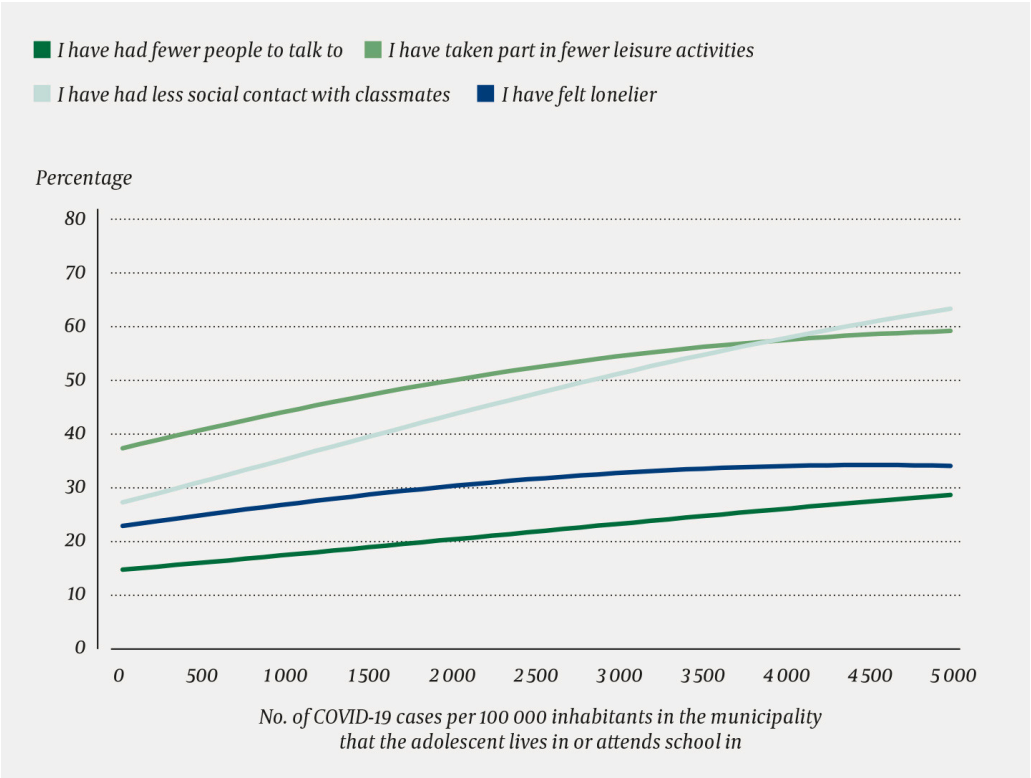

Figure 3 Infection rates in the municipality (cumulative cases throughout the pandemic up to 30 April 2021 per 100 000 inhabitants) and responses from adolescents' assessment of relationships with peers (N = 106 448).

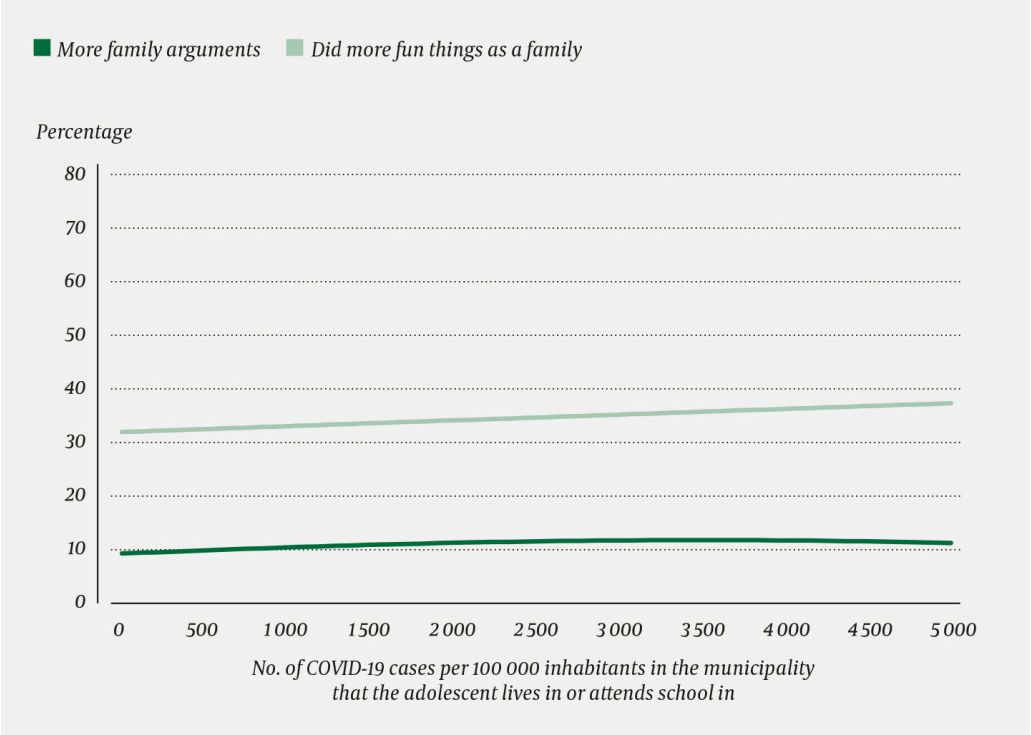

Figure 4 Infection rates in the municipality (cumulative cases throughout the pandemic up to 30 April 2021 per 100 000 inhabitants) and responses from adolescents' assessment of family relationships (N = 106 448).

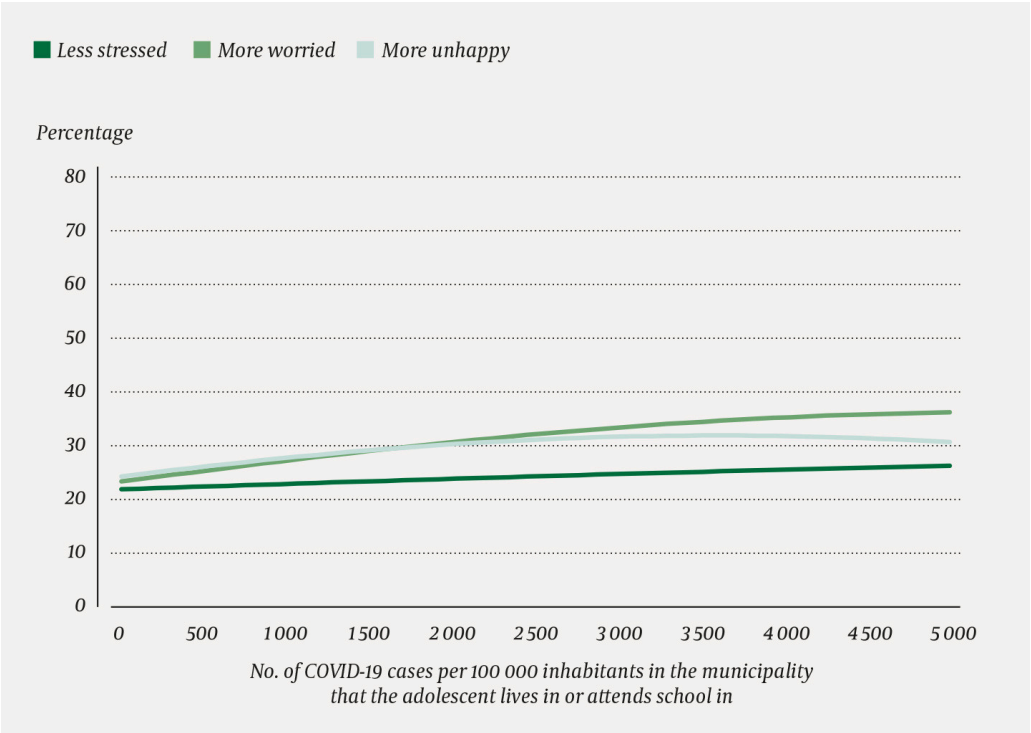

Figure 5 Infection rates in the municipality (cumulative cases throughout the pandemic up to 30 April 2021 per 100 000 inhabitants) and responses from adolescents' assessment of their own mental health (N = 106 448).

Analyses of non-responses showed that boys (OR = 1.37; 95 % confidence interval (CI) 1.33 to 1.41), upper secondary school pupils (OR = 1.15; 95 % CI 1.12 to 1.19) and adolescents with a low socioeconomic status (OR = 1.91; 95 % CI 1.84 to 2.00) were overrepresented among those who had not answered all items.

Discussion

We used data collected from 106 448 adolescents in Norway to investigate adolescents' own assessments of how the COVID-19 pandemic has affected their lives up to spring 2021. Overall, many adolescents reported that the pandemic had affected their lives in a partly or very negative direction, while some also reported positive consequences. Girls, upper secondary school pupils and those with a low socioeconomic status reported more negative consequences than other adolescents. Furthermore, adolescents in municipalities with high infection rates experienced more challenges during the pandemic than adolescents from other municipalities.

As expected, many adolescents reported that the pandemic had a negative impact on their lives, both overall and on their relationships with peers and parents and their mental health. More unexpectedly, many also reported positive changes. For example, 33 % agreed somewhat or strongly agreed that they did more fun things as a family, while only 11 % reported an increase in family arguments. Similarly, 23 % indicated that they were less stressed about daily life, while 29 % said they felt more unhappy, sad or depressed than before. This is in line with a literature review by the Norwegian Institute of Public Health, which shows that children and adolescents fared worse in some areas and better in others during the earlier stages of the pandemic (3).

One important finding is that girls, the oldest adolescents and those with a low socioeconomic status experienced more negative changes in connection with the COVID-19 pandemic than other adolescents. Studies show that girls generally worry more than boys and are at greater risk of developing symptoms of anxiety and depression (13). This may explain why girls also reported more negative changes as a consequence of the pandemic. Of particular interest is the finding that the oldest adolescents are hardest hit. This may be due to the fact that greater efforts have been made to shield the youngest children from restrictions such as social distancing, cancelled leisure activities and closed schools. It is also conceivable that adolescents in their late teens are in a phase of development where they need more freedom than younger children. With regard to the finding that those with a low socioeconomic status report the most negative consequences, the pandemic may have a greater financial impact on families with few economic resources, and adolescents from these families may be particularly vulnerable when protective factors, such as school attendance and contact with friends, are diminished.

The large number of participating municipalities and respondents and the high response rate are strengths of the study; however the study also has its limitations. Attrition analyses showed that boys, respondents with a low socioeconomic status and upper secondary school pupils were overrepresented in the group who failed to answer at least one question. The aim of this study was to obtain information about adolescents' self-assessment of the consequences of the pandemic after approximately one year. Such retrospective assessments do not necessarily reveal whether the pandemic has had a causal effect, because it is difficult for respondents to accurately recall past events and compare these with their current situation (14). For knowledge about the causal effects of the pandemic, more research is needed that compares adolescents' responses before and during the pandemic.

The results show that many adolescents feel that the pandemic has had more negative than positive consequences. The responses indicate that girls, older adolescents, adolescents in families with a low socioeconomic status and adolescents in municipalities with a high infection rate may be particularly vulnerable to negative changes during the pandemic. Measures aimed at adolescents in areas with a relatively high infection rate, girls, older adolescents and adolescents in families with a low socioeconomic status may therefore play a particularly important role in preventing long-term psychosocial effects as a result of the pandemic. Like several other studies, our study indicates that adolescents are also experiencing positive changes as a result of the pandemic.

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