

Literature screening report III

Secondary impact of COVID-19 containment measures in children, adolescents, and young adults: mental health and recommendations

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Preamble

Numerous scientific publications become available on a daily basis, reflecting the rapid development of knowledge and progress of science on COVID-19 related issues. Leading authorities should base decisions or policies on this knowledge; hence they need to master the actual state of this knowledge. Due to the large number of publications shared daily, decision makers heavily depend on accurate summaries of these publications, in the different public health domains. Therefore, the authors of this report were mandated by the Swiss School of Public Health plus (SSPH+), on request of the Federal Office of Public Health (FOPH), to inform the FOPH on recent findings from the literature regarding mental health and public health recommendations to cope with secondary health impact caused by the pandemic and containment measures.

Background

The COVID-19 pandemic is an unprecedented global public health crisis touching the whole population in different ways. Since the beginning of the pandemic containment measures and policies have been implemented to curb the epidemics. Driven by the scenario of an exponential epidemic and overburdened health system, the Swiss government ordered different containment policies and hygiene recommendations. Evidence indicates that children and adolescents have an equally high attack rate, but luckily are at far less risk to contract severe COVID-19. However, the literature overview provided to the FOPH on health impact of confinement measures in the young population, suggests a considerable secondary health risk and adverse outcomes in children, adolescents, and young adults. Due to the methodological heterogeneity of the studies and geographical variation of the containment measures, it is challenging to draw definitive conclusions about the real impact of the COVID-19 pandemic. Furthermore, the published evidence is of varying quality and strength of evidence, especially limiting is the high number of cross-sectional studies without previous data to compare results to. Irrespectively, the recent review indicates a rather consistent impact on mental health outcomes and impact on access to or state of the art care, while impact on health behaviors and somatic health outcomes varies more across Europe.

The current literature screening report focusses on mental health outcomes and identifies longitudinal studies in children and youth aged 0 – 25 years addressing these outcomes to be able to deduce causality and/or change over the pandemic period. Mental health is defined broadly, covering mental well-being to mental disorders and psychiatric conditions. The focus is put on direct effects on confinement/containment measures or the pandemic periods on mental health outcomes, and suggestions by authors regarding solutions, recommendations, and best practices in the context. Further, in this last report we include a preview on expected evidence and publications by Swiss researchers and institutions on the two topics mental health and health behaviors (nutrition, physical activity, and screen time). This overview may indicate where knowledge gaps might be filled in future or continue to exist for Switzerland.

Questions addressed in Phase III.

- What are the secondary mental health effects of COVID-19 and the containment measures in children, adolescents, and young adults?
 - What impact do the pandemic and the containment measures have on mental health of children, adolescents, and young adults?
 - What impact do the pandemic and the containment measures have on vulnerable children, adolescents, and young adults?
- Overview and comparison of recommendations and best practice regarding mental health in different countries (to be provided in final report).
- Overview of forthcoming Swiss evidence and publications regarding mental health outcomes, nutritional behavior, physical activity, and screen time (to be provided in final report)

Methodology

The current literature search for this interim report spans the period February 28th, 2021, to May 2nd, 2022. Longitudinal studies from the previous reports on secondary mental health impact were identified and added to provide an overall picture. Three literature data banks were accessed to identify relevant literature: PubMed (biomedical literature), Embase (biomedical), and PsycInfo (psychological literature). A search string was defined and tested based on the study questions and outcomes of interest (see attachment). The search string was adapted to the three literature data banks, which provide different features for selective searching. Literature was searched at four time points: April 5th, May 3rd, June 2nd and July 15th, 2022.

Further to receive an overview of Swiss evidence to be published within the next few months or currently in print, researchers who contributed to NFP78 or 80, researchers identified during the review, Public Health faculty (SSPH+), and child and youth stakeholders were addressed specifically with the request to add information on existing evidence on a padlet ([link to padlet](#)). The padlet was developed specifically for this task. It is at the same time a collection tool and an information tool, open to all interested researchers and policymakers. It will be open until end of the year. Eligible published articles, not yet in the recent reports were included.

Literature was exported into Covidence (www.covidence.org), a systematic literature search software, and screened for inclusion.

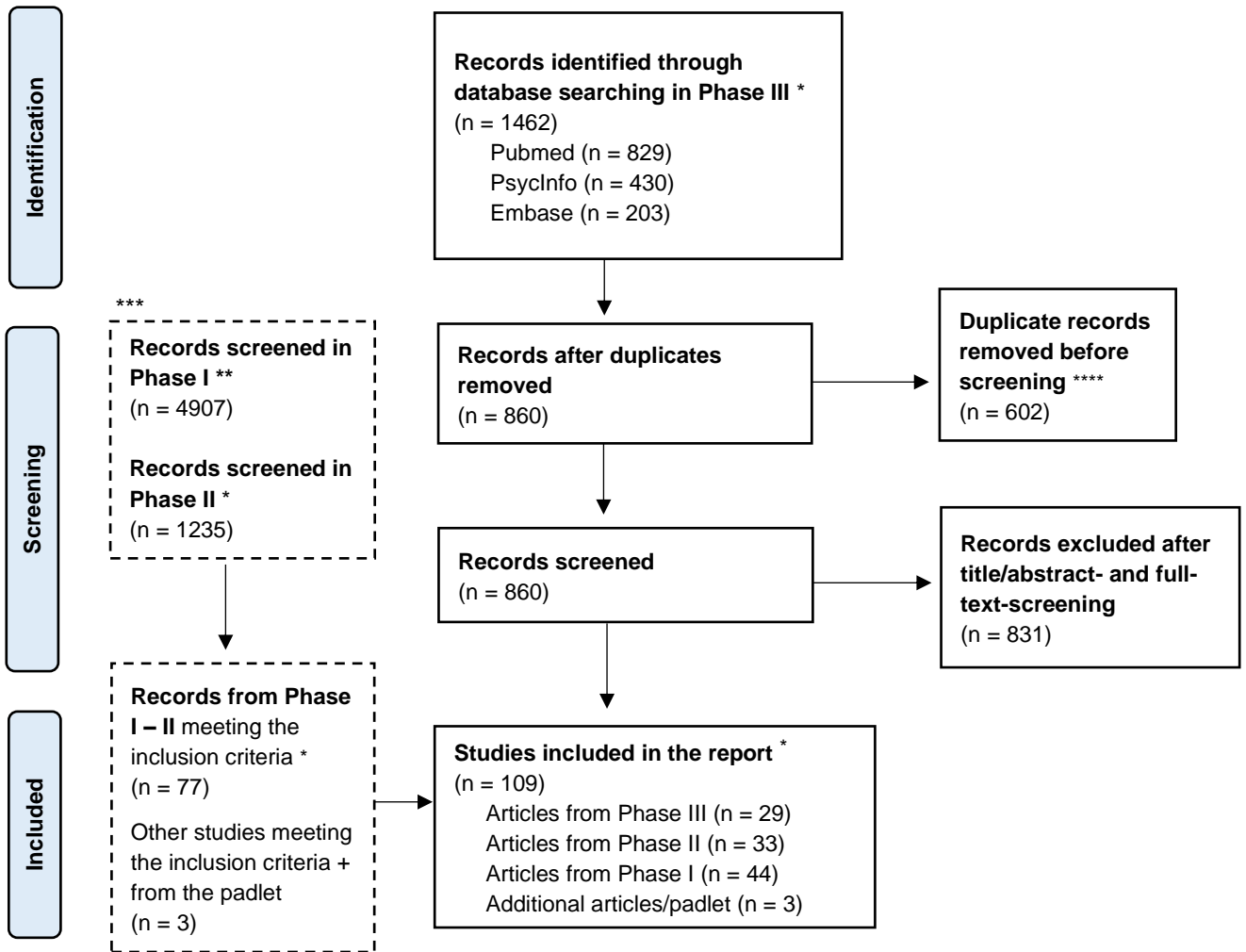
Inclusion criteria were data on children, aged 0 – 25 years, exposure related to pandemic policies or containment measures, outcomes according to study questions, study data from European continent,

and a longitudinal study design. Longitudinal study design was defined as any study that analyzed data at two time points in either the same population or using the same instruments in a reference population. Systematic reviews were not included but checked for longitudinal studies. In case of longitudinal studies, they were included, if not already presented in the reports of phase I / II. Relevant results of the included publications were extracted in Covidence by a researcher. All studies included in the narrative review were considered of sufficient quality.

Data extracted were study and sample characteristics, study design, outcomes, and effect sizes, as well as recommendations of references to best practices.

For the in-depth analyses we included all longitudinal studies from the previous reports, covering the time-period January 1st, 2020 – February 28th, 2022. The current report from Phase III builds on the analyses of the previous report from Phase II.

Identification of studies on the topic “Secondary health impact of COVID-19 containment measures in children, adolescents, and young adults”



* Inclusion criteria: data on mental health, age (0-25 years), country (from Europe), longitudinal data

** Phase I: Focus on physical and mental health, age (0-25 years), country (from Europe), including articles from the EUPHA screening

*** For more details, see reports of Phase 1 and 2 (uploaded on the [project-website](#))

**** The numbers of duplicates for Phase 3 results from the total amount of articles found in Phase 1-3.

Results and Findings

What are the secondary mental health effects of COVID-19 and the containment measures in children, adolescents, and young adults?

What impact do the pandemic and the containment measures have on mental health of children, adolescents, and young adults?

Summary

The following synthesis of the research results on the impact of the pandemic and containment measures on mental health in children and youth is based on the literature reported in detail below. Overall, the literature supports differential impact on children and youth and trajectories of mental health in children, adolescents, and young adults in line with lockdown restrictions, such that in general their mental health decreased with the onset of the COVID-19 pandemic, and for some outcomes increased over the pandemic, while for others the prevalence decreased with time. First studies on recovery of the pandemic have been published, indicating an improvement as the pandemic measures were loosened and life became “normal” again.

Well-being and Quality of life

Studies on well-being/quality of life consistently indicate a deterioration of these outcomes across all age-groups due to the pandemic and also as the pandemic continues. Longitudinal data was available for primary school children, adolescents and young adults, as well as specific sub-groups. Partial improvement is correlated to loosening of lockdowns or pandemic measures, respectively worsening with lock-down and epidemiological waves.

A few studies report inconsistent results: One study found no change in cancer patients. It compared Jan – June 2020 data with pre-pandemic data, thus including pre-pandemic data into their pandemic period. Another study in cancer patients investigating the trend from March to September 2020 shows a deterioration of QoL and an increase in procedural and treatment anxiety using a pediatric patient specific QoL. One Swiss study in German-speaking adolescent yields improvement of QoL mainly due to increased free-time and feeling fit and well. They also state an increased feeling of loneliness and missing friends. Another Swiss study, albeit in a very limited

sample of schoolchildren, indicates improvement of HRQoL in the post stay at home period following more severe measures. One study in Germany found no QoL decrease in adolescents relative to pre-pandemic during the lockdown but the small sample size and low prevalence of outcomes may explain the inconsistency with the bulk of the literature on QoL. Similarly, a Portuguese study in school children found an improvement of quality of life and social support during the pandemic compared to before in unadjusted analyses stratified by gender. The authors suggest the result might be biased by the recent loosening of restrictions and consequential relief at the pandemic measurement point. Gender differences indicate a stronger positive increase in boys as compared to girls.

It becomes obvious that there are different vulnerability factors that may play a role, as well as different trajectories of mental health across the pandemic. 5 distinct trajectories have been identified, of which two show a deterioration over the pandemic respective, a low level of QoL after an initial drop. Vulnerability factors, possibly predicting adverse trajectory, are female sex (predominantly reported, but less frequently also male sex), ethnic minorities, previous mental health problems. A small mixed-method study investigated the relevance of friendships on well-being and the challenges with friendships during the pandemic. Another explorative study suggests that children complying with physical activity recommendations had a higher QoL during school closures. Studies in general populations ≥ 18 indicate a higher risk in younger adults as compared to older adults. A study in children with chronic disease comparing life satisfaction to healthy children points to an overall lower level of life satisfaction, but a similar drop of life satisfaction due to the pandemic. Further, carer status is shown to be a vulnerability factor. Compared to non-carers a study from the UK showed a significantly higher reduction of well-being explained by psycho-social factors at baseline and during the pandemic.

Concern about social COVID-19 consequences and sleep duration as well as direct access to outdoor spaces/living in semi-urban homes are identified as a moderator of mental well-being. Keeping schools open may have been a protective factor, given that a study in Sweden showed no relevant decrease of well-being (hope, self-efficacy, and self-esteem). On the other hand, school closures were consistently associated with more sleep time and less school related social and academic stressors.

Scales and instruments used in the well-being and QoL research differed: Kidscreen (10), KINDL-R, PedQoL (3.0), GHQ-12, Warwick Edinburgh Mental Wellbeing Scale, HRQoL, 5-item Satisfaction

with Life Scale by Diener and colleagues, the Habitual Subjective Well-Being Scale, and Multidimensional Student's Life Satisfaction Scale, and single Likert type items. Statistical comparisons across studies are thus limited, but all instruments are validated and reliable, thus the general direction of the results should be comparable.

Distress

The longitudinal studies including young adults investigating distress confirm an increase on distress in the initial phase of the pandemic in March/April. There is an indication of a return to pre-pandemic values from one large study in the UK combining various pre-pandemic data and pandemic data until September 2020. Vulnerability factors were female sex, non-white ethnicity and younger age, as well as frequent COVID-related information-seeking behavior and staying indoors. They indicate a higher risk in younger adults as compared to older adults.

A study with adolescents implies that not all adolescents reacted with distress increase, but those that did showed lower distress in pre-pandemic times. The authors suggest they might have developed fewer coping mechanisms in the pre-pandemic period. Further vulnerability factors identified by the authors were financial concerns, staying at home and parental stress, and carer-status. One study with adolescents linked higher distress to loneliness. One paper addressed children with intellectual disability and could not find a difference in their stress levels.

Scales and instruments used to measure distress differed less widely than for well-being: PSS-4, GHQ-12 (twice), DASS-12.

Depression

Findings from a broad range of studies consistently found that depression in children as young as seven years as well as in adolescents and young adults significantly increased from pre-pandemic phase to the pandemic phase. Thereby, increases in depression in adolescents were associated with increases in somatic health complaints, with greater increases in girls. Further studies indicate that the burden remained high during the first year of the pandemic even after the end of the lockdown. If at all, the findings point to a slight decrease over the summer when less restrictions were in place but a renewed increase during the autumn 2021 when infection rates increased and many countries reinstated lockdowns.

As an exception, some adolescents with pre-existing mental health problems did not seem to experience a worsening as much from the COVID-19 pandemic. The findings of five studies

suggest that depression in adolescents with pre-existing mental health problems did neither decrease nor increase but remained rather stable. A reduction of external stressors is discussed as potential explanation. As exceptions, one study observed that adolescents with higher internalizing symptoms one year before the lockdown had increased depressive symptoms and another study found that autistic children and adolescents had higher levels of depression and anxiety symptoms during the pandemic compared to young people with special educational needs and disabilities (SENDs), who showed a decrease in anxiety symptoms over time.

Moderating factors that were associated with increased depression in several studies were female sex, younger age, lower social support, loneliness, and financial household problems. Moderating factors that were associated with increased depression in at least one study were parental stress, worse family functioning, perceived stress at school, increase internalizing symptoms before the pandemic, worries about poorer education or job opportunities and damage to the social network, high COVID-19-information consumption, staying indoors (i.e., being less physically active), and migration status.

Depression was often investigated in combination with other outcomes, particularly anxiety but also QoL, well-being, behavioral problems or somatic health. All studies were survey studies that used various scales to measure anxiety. The Patient Health Questionnaire (PHQ) was used most often. Other scales were the Center for Epidemiologic Studies Depression scale (CES-D), the Revised Child Anxiety and Depression Scale (RCADS), the State-Trait Depression Scale (STDS), the Hospital Anxiety and Depression Scale (HADS), the Symptom Checklist-90 (SCL-90), the Depression Anxiety Stress Scale (DASS-21), the depressive problems subscale of the Youth Self-Report (YSR) from the Achenbach System of Empirically Based Assessment (ASEBA), the Mental Health Inventory (MHI-5), Psychiatric and Diagnostic Screening Questionnaire (PDSQ) and the COVID-19 specific "Impact Scale of COVID-19 and home confinement on children and adolescents"

Loneliness

Findings on the effects of the pandemic on loneliness are rather scarce and inconsistent and should thus be interpreted cautiously. Whereas one study found that loneliness in young adults increased from the pre-pandemic phase to three weeks into the first lockdown of the pandemic phase, another study observed no change. Two further studies indicate that self-reported loneliness in adolescents remained high during the lockdown but that loneliness in young adults tended to decrease over the summer when less restrictions were in place and to rise again in autumn and winter 2020.

A moderating factor that was associated with increased loneliness in two studies was having a lower annual household income. Moderating factors in at least one study were female sex, pre-existing physical and mental health conditions, living alone, being unemployed, not being in school and not having access to outdoor spaces (i.e., not having a garden).

Loneliness was often measured as an additional outcome or process variable. All four studies were survey studies. Whereas one study used three-item UCLA Short Loneliness Scale, three studies used single-items questions such as “in the last 4 weeks, how often did you feel lonely?” which might limit the validity and reliability of the measurement.

Anxiety

Anxiety was measured at different time points in the cited studies. Studies investigating pre-pandemic data with anxiety during the early lockdown in April 2020 tend to identify an increase, partially only slight, and studies investigating the development during the pandemic indicate a reduction late in the first wave or when measures were first loosened. The only study, that did not report an increase in anxiety was a small school sample of children from middle-high SES households. They found an opposite effect of confinement, reduction of anxiety, while none of the values were clinically relevant.

In adolescents' vulnerability factors were high level of parental stress, as well as baseline (previous) anxiety and depression levels. In young adults, female sex, isolation/loneliness or various COVID-19 related worries were reported. Higher resilience was a protective factor in one study.

Anxiety was investigated often in combination with other outcomes, such as well-being or depression. All studies were survey studies relying on various scales to measure anxiety. GAD-7 was used in most, DASS-21 in one, and two further studies used specific Covid (Impact Scale of COVID-19 and home confinement) or national scales (Spanish SENA scales).

Behavioral/emotional (affective) disorders

Findings from a broad range of studies consistently found that behavioral/emotional (affective) problems in children as young as 1.5 years and in adolescents significantly increased from pre-pandemic phase to the pandemic phase. Further studies indicate that the burden remained high or even increased during the first year of the pandemic after the end of the lockdown. Financial

difficulties (low pre-existing family SES and declines in income during the COVID crisis) were associated with increased psychological difficulties in children during the period of school closure as indicated by increased Attention-deficit/Hyperactivity disorder (ADHD) symptoms.

As exceptions, adolescents with mental health problems before COVID-19, children with intellectual disability, children and adolescents with tic disorders, as well as adolescents and young adults with autism spectrum disorder (ASD) have been relatively stable, although one study did not find a decrease but referred to the small sample that warranted caution in interpreting the results. A reduction of external stressors is discussed as potential explanation.

Moderating factors that were associated with increased risk of behavioral/emotional (affective) disorders that were observed in several studies were parental and family stress, parental overreactivity and dysfunctional parenting style as well as financial hardship in the family. Moderating factors that were observed in at least one study were inequality of opportunity in online homeschooling, one-parent, one-child households, adult household members' COVID-19 symptoms and illness, parent/carer with higher self-reported mental health symptoms (of depression, anxiety, and stress) as well as perceived stress, negative coping strategies, unhealthy activities, worsening of the relationships with others, mask wearing, having special education needs, and having neurodevelopmental disorders. Regarding age, results were inconsistent: whereas two studies found that younger age increases the risk of behavioral/emotional problems, two different studies observed that older age increases the risk. The interplay of the child's, adolescent's or young adult's age and contextual stressors were discussed as potential explanation.

Behavioral/emotional (affective) disorders were investigated with the Strengths and Difficulties Questionnaire (SDQ) in more than half of the studies. Other measures were the System of Evaluation of Children and Adolescents (SENA) scale (emotional regulation, difficulties, attentional difficulties, hyperactivity, and impulsivity), the Impact Scale of COVID-19 and Home Confinement on Children and Adolescents, the Profile of Mood States Scale (POMS), the Positive and Negative Affect Scale for children (PANAS-C), the Face, Legs, Activity Cry and Consolability Scale, the Child Behavior Checklist (CBL-1,5-5 year-old), the Child Behavior Check List questionnaire (6-18), the Youth Self-Report (YSR) from the Achenbach System of Empirically Based Assessment (ASEBA), the Aberrant Behavior Checklist (ABC), and the Adaptive Behavior Assessment System.

Substance and media abuse

Overall, several articles observed a stable or reduced alcohol consumption throughout the pandemic. However, studies also found interindividual differences as well as time effects depending on the phase of the pandemic. Whereas 80% of university students in Switzerland did not increase their alcohol consumption and binge drinking during the early pandemic, 20% did (Zysset et al., 2022). Thereby, drinking more before the pandemic, regular binge drinking, higher anxiety scores as well as male gender, younger age and not living with parents were associated with increases in alcohol consumption and binge drinking. Drinking frequency and quantity was also found to be associated with level of depression in a Spanish study (Vera et al, 2021) but not in a college students' sample in Portugal (Vasconcelos et al, 2021). Whereas acute alcohol intoxications decreased substantially in the first lockdown as compared to the pre-lockdown, they increased again afterwards (Pigeaud et al., 2021). Regarding the frequency of psychoactive substance poly-exposures during the lockdown, a study with more than 10'000 adolescents and young adults that used hospital data observed a substantial increase (Spinelli et al., 2022). Similarly, a study on antidepressants that used health insurance data observed a shift from a slightly decreasing trend to a high increase. Although there has already been a slight rising trend in the use of hypnotics and anxiolytics in adolescents and young adults, it increased considerably from the pre-pandemic to the pandemic phase. Finally, one study reported reductions of e-cigarette use among 16- to 18-year-olds compared four and two years before the pandemic and that this decrease was greater among boys compared with girls.

Two studies investigated the effects of the COVID-19 pandemic on gaming and social media disorders. One study found that adolescents significantly increased the frequency and time of their game and social media usage from pre-pandemic phase to the pandemic phase. Although they still spend less time on games and social media than at-risk or pathological users, the difference decreased during the lockdown. A second study observed that children and adolescents with mental health problems increased their media time as well as problem behaviors such as aggressiveness and anger due to media use during the lockdown but decreased it again after the lockdown. Whereas boys increased their gaming time, girls increased their time spend on social media. Increasing game time was associated with a deterioration of psychopathological problems in children and adolescents (with results in adolescents being inconsistent). Parents reported a positive relation between the indicated happiness of the child and the media time. Another study on Screen time and Green time in Switzerland observed that screen times remained stable between autumn 2020 and spring 2021 (with about 1 hour and 20 minutes in 5-9 year-olds, 2 hours in 10-14

year-olds and 4 hours and 20 minutes in adolescents aged 15 year or older), that it correlated negatively with their mental health and that it was not or only weakly correlated with their time outside. Green time on the other hand was found to be a protective factor for mental health.

Given the limited number of studies, the small sample sizes and methodological limitations, a cautious interpretation data seems appropriate.

Eating disorders

Eating disorders increased during the lockdown and seemed to remain stable over the course of the first pandemic year. One study from the UK showed that the prevalence of eating disorders and symptoms of dieting, food preoccupation, and oral control and internalizing/externalizing problems increased in female as well as male adolescents from before to during the COVID-19 pandemic. A second study observed binge eating in adolescents during spring and autumn of 2020 and found no reduction in the binge eating scores over time. Finally, a third study on young adults observed that pre-pandemic eating disorder scores were strongly associated with eating disorders during the pandemic, with conflict at home and individuals' impulsivity traits having a significant association with ED psychopathology mid-pandemic, even while accounting for established longitudinal (antecedent) and concurrent predictors of risk in ED. Measures used to assess eating disorders comprised the Eating Attitudes Test-26 (EAT-26), SCOFF (Sick, Control, One, Fat, Food), and Binge Eating Scale (BES)).

Suicidal behaviour and psychiatric hospitalisations

The results and trends regarding suicide ideation, attempts and non-suicidal self-harm vary by outcome. Survey studies are most often in adults >18 years, while the hospital data studies report data on children and adolescents, thus the type of evidence available is different by age group. Highly consistent are studies on suicidal ideation, which indicate an increase compared to pre-pandemic data and, also within the pandemic from early to later waves. Thereby, one study found that increases in self-harming ideation are associated with increases self-harming and aggressive behaviors, unprotected sex, binge eating episodes, general and school anxiety, and stress regarding the future uncertainty (but also decreases in stress regarding home life, school attendance, romantic relationships, peer pressure, and financial pressure). Of the two studies yielding the opposite, namely a reduction of suicidal thoughts, one was limited by sample size, the other explained the observation with overall reduced services and utilization of health services. The only study including Swiss data did not find an increase of suicidal ideation for Swiss young adults,

while overall the study finds age-specific increase. The Swiss sample showed higher prevalence in males than females. A cautious interpretation of the Swiss data seems appropriate, also given the small sample size and data collection methods.

Suicide attempts decreased during the lockdown in all studies, while non-suicidal self-harm (NSSH) varies by study. One international hospital data study showed an increase, two others during the first lockdown report a decrease, two did not find a change in the prevalence of non-suicidal self-harm during the pandemic or compared to pre-pandemic times prevalence. A large investigation of the French national hospital data base indicates a decrease in self-harm in all but female adolescents. Studies that found a decrease discuss the potential of a reduction of presenting oneself with self-harm during the lockdown, respectively an under-serving of adolescents during the lockdown.

Vulnerability factors found were female sex, younger vs. older adults, social disadvantage, pre-existing mental health problems or self-harm. A protective factor was a high sense of coherence, and in university students the number of days spent physically on campus, indicating the protective effect of open educational systems.

All studies point to the need to monitor these outcomes throughout the pandemic, as most studied the initial pandemic phase or first wave and changes across all outcomes and over the pandemic development are likely.

Scales used vary widely: Paykel Suicide Scale, Adult Psychiatric Morbidity scale, one item from the Child and Adolescent Self-Harm in Europe study, and hospital emergency data/anamnestic data. With exception of the one-item study, the outcome was assessed with validated tools or by medical staff. The comparison of hospital data is feasible across countries.

Mental health care utilization

In addition to the above hospital studies, further studies investigated the trend of mental health referrals and visits more generally. It seems as if during the lockdown mental health referrals went down, like most referrals and emergency visits for other diagnoses during the lockdown. One study indicates an increase after the lockdown, however, not in <20-year-olds, while another in an adolescent health center observed an increase after the lockdown (May – June 2020). A German study investigating hospital contact types identify a 30% general increase of contacts for mental

health problems, with a bit higher increase for presentation at the hospital as compared to telephone contact.

It is clear from the data presented, that the lockdown had an impact on overall utilization behavior of emergency departments. The exact reasons are unclear, it could be a reduction of need/indication or conscious decision not to present one-self or refer patients. However, for mental health utilization there may be an opposite effect with studies showing a significant increase. In addition, some studies discuss the potential under-serving the needs. Some studies identify an increase in certain psychiatric or related diagnoses, such as pain, anxiety, intoxication, or neuropsychiatric diagnoses, and a lower presentation with behavioral disorders. Regarding severity studies that focus on mental health diagnoses indicate an increase of severity measured by the need of hospitalization or need of intensive care (suicidal behavior). One study differentiated patients who presented themselves a first time during the pandemic and those who had been seen before. In first time patients, anxiety, mood, and somatic symptom-related disorders increased and females were more frequent.

Number of publications: 109 (77 (Phase I-II) 29 (Phase III) 3 (additional studies from Padlet))

Time period: January 2020 – February 2022 (Phase I-II), March – mid July 2022 (Phase III)

Results

Studies in this report comprise studies copied from the November 2021 report (i.e., Phase I), from the December 2021 and March 2022 reports (i.e., Phase II), and from the June 2022 interim report and the current report (i.e., Phase III).

Results from Phase III

QoL/Life satisfaction and Wellbeing

In a Swiss study, Albrecht et al. (2022) investigated the effect of school closures on health related quality, psychological distress and sleep quality and in high school students. In total, 12'238 adolescents from 21 high schools in the canton of Zurich took part in three anonymous, cross-sectional online surveys. Data from before the pandemic (2017, "pre-pandemic control group", $n = 5308$, $Md_{age} = 16$ years, $IQR = 15-17$ years), during school closures (spring 2020, "closure group", $n = 3664$, $Md_{age} = 16$, $IQR = 15-17$) and after the reopening of schools (spring 2021, "postclosure group", $n = 3266$, $Md_{age} = 16$, $IQR = 14-17$) were compared. Sleep patterns were assessed using the Munich Chronotype Questionnaire (MCQT), Health related Quality of Life (HRQoL) was assessed using the KIDSCREEN-10 questionnaire and depressive symptoms were assessed only in the closure and postclosure groups with the withdrawn/depressed scale of the Youth Self Report (YSR). Results revealed that HRQoL was significantly higher in the closure group ($Md = 44.48$, $IQR = 40.24-49.76$, $p = .002$) and lower in the postclosure group ($Md = 42.27$, $IQR = 36.51-48.29$, $p = .02$) compared to the control group ($Md = 42.27$, $IQR = 37.42-48.29$). The postclosure group ($Md = 58$, $IQR = 54-69$, $16.6\% \geq 70$) reported significantly higher levels of depressive symptoms than the closure group ($Md = 57$, $IQR = 51-64$, $9.1\% \geq 70$; $n = 5592$, $B (SE) = 2.95 (0.49)$, $p < .001$, $R^2_{\beta^*} = 0.02$, $95\% CI [0.01, 0.03]$). Alcohol consumption was significantly less in the closure group than in the control group ($p < .001$), while the postclosure and control groups had similar values.

Furthermore, results on sleep behavior revealed that on school days, the sleep duration of the closure group ($Md = 9$, $IQR = 8.25-9.75$, $p < .001$) was on average 75 min longer than that of the control group ($Md = 7.75$, $IQR = 7.08-8.33$). The postclosure group showed similar scores as the control group ($Md = 7.92$, $IQR = 7.00-8.50$). On weekends, the three groups had comparable sleep-wake patterns. Difficulties falling asleep and problems sleeping through were significantly more frequent in both the closure (33.8% and 11.9% more than four times in the past two weeks, $p < .001$) and the postclosure group (37.3% and 13.4%, $p < .001$) compared to the control group (30.9%

and 8.3%). Differences found were supported by multivariate regression analyses adjusting for socio-demographic characteristics.

Benzing et al. (2022) investigated health-related quality of life (HRQoL) and physical activity (PA) in Swiss school children aged 7 to 12 years ($M = 10.44$; $SD = 1.34$) during ($N = 57$) and after ($N = 36$) the first COVID-19 related stay at home order (SaH) in Switzerland. The first assessment was conducted during the initial stay at home order from April 21st to May 4th, 2020, the second between June 24th and July 3rd, 2020, when some restrictions were lifted again. HRQoL was assessed using the parent version of the Kid-KINDLR questionnaire and PA using accelerometry (Actigraph GT3X), with activity being classified as sedentary, light, moderate, or vigorous intensity. For HRQoL, significantly lower scores were observed in the total score ($M_1 (SD) = 76.26 (10.21)$, $M_2 (SD) = 82.96 (8.31)$; $d = -0.66$), as well as in the psychological well-being ($M_1 (SD) = 80.15 (14.40)$, $M_2 (SD) = 87.89 (11.28)$; $d = -0.48$), self-esteem ($M_1 (SD) = 75.22 (13.35)$, $M_2 (SD) = 80.74 (9.41)$; $d = -0.39$), friends ($M_1 (SD) = 65.17 (21.35)$, $M_2 (SD) = 81.26 (12.07)$; $d = -0.70$) and everyday functioning score ($M_1 (SD) = 76.90 (16.15)$, $M_2 (SD) = 82.58 (12.41)$; $d = -0.44$) during SaH compared to afterwards (all $p < .05$). Less children complied with WHO PA recommendations on PA (56.1% during SaH, 77.2% after SaH, $p = 0.023$). Further analysis revealed that children who did meet the WHO PA recommendations (being physically active for on average at least 60 min a day) during SaH had higher scores in overall HRQoL (≥ 60 min of Daily PA: $M (SD) = 78.91 (9.85)$, <60 min of Daily PA: $M (SD) = 72.87 (9.64)$; $d = 0.61$) and psychological well-being (≥ 60 min of Daily PA: $M (SD) = 83.59 (11.67)$, <60 min of Daily PA: $M (SD) = 75.75 (16.24)$; $d = 0.56$) than the children who did not meet those recommendations.

Henseke et al. (2022) used longitudinal, individual-level data from six waves of the Youth Economic Health Monitor (YEAH) survey. The representative sample contains 6000 cases from 3746 16–25 years old (51% female) UK residents. The study investigated life satisfaction and mental distress during the last phases of the COVID-19 Lockdown between February 2021 and May 2022 and COVID-19 stressors (Covid-related experience of illness, severe illness or the death of family or friends, reduced social contacts, perceived financial strain, concerns about financial, future, career prospects, and job skills learning.). Life satisfaction improved with time ($M_{Feb-21} = 5.72$ vs. $M_{May-22} = 6.71$, $p < .001$). Mental distress change was statistically non-significant ($M_{Feb-21} = 2.32$ vs. $M_{May-22} = 2.32$, $p > .05$). There was an increase in social contacts ($M_{Feb-21} = 0.55$ vs. $M_{May-22} = 0.18$, $p < .001$), no change in financial strain (Financial strain: $M_{Feb-21} = 0.17$ vs. $M_{May-22} = 0.17$, $p > .05$), an increase in financial worries ($M_{Feb-21} = 0.17$ vs. $M_{May-22} = 0.22$, $p < .01$), fewer

concerns about career prospects (MFeb-21 = 0.21 vs. MMay-22 = 0.08, $p < .001$) or job skills training (MFeb-21 = 0.17 vs. MMay-22 = 0.10, $p < .001$) by the end of the observation period. Subgroup analysis suggests that women's ($F(7, 3729.8) = 2.32, p = 0.023$), adolescents' ($F(7, 3735.8) = 2.18, p = 0.033$), and students' ($F(7, 3731.7) = 2.65, p = 0.010$) life satisfaction responded more strongly to the stressors considered in this study. The findings highlight the positive effects of less stringent lockdown restrictions, economic recovery, and opportunities for job skills learning on youth's happiness.

Steinmayr et al. (2022) used data ($N = 425, M_{age} = 8.19, SD = 1.04$) on subjective well-being from the ongoing COMPARE longitudinal study (Christiansen et al. 2019) conducted in German elementary school children. There was no significant slope for Time1 (t1, t2 & t3: pre-pandemic) in any model ($-0.06 \leq \beta \leq 0.08$, all $p \geq 0.176$), indicating no significant change of dependent variables in the pre-pandemic phase investigated. The slope for Time2 (t3 & t4; pandemic) was significant in the models for general mood ($\beta = -0.20, p = 0.032$) and life satisfaction in the family domain ($\beta = -0.21, p = 0.010$) indicating a significant deterioration. The slope for Time2 narrowly failed to reach significance for general life satisfaction ($\beta = -0.13, p = 0.078$). Generally, being male was significantly associated with lower life satisfaction in the school domain ($\beta = -0.28, p < 0.001$), however, being male was non-statistically significantly associated with life satisfaction in the school domain declining less between t1 and t3. There were no significant associations of migration background ($-0.02 \leq \beta \leq 0.03$, all $p \geq 0.329$), number of books at home ($-0.10 \leq \beta \leq 0.03$, all $p \geq 0.217$), or t1 grades ($-0.10 \leq \beta \leq 0.03$, all $p \geq 0.129$) with the dependent variables. Interaction between time 2 and migrant background indicating lower family satisfaction, albeit non-statistically significant.

The study by Nakanishi et al. (2022) investigated longitudinal associations between adolescents' carer status and mental health outcomes between 2018/2019 to March 2021 in the United Kingdom. The participants ($n = 3,927$) answered mental health questions in both the Millennium Cohort Study sweep 7 survey (age 17 years in 2018/2019) and at least one of three waves of the COVID-19 survey from May 2020 to March 2021. Carer status at the age of 17 years was assessed using a single question regarding whether the participant regularly looked after anyone who needed care, without being paid. Outcome measures were psychological symptoms and mental well-being, measured with the Kessler Distress Scale and the Warwick-Edinburgh Mental Well-being Scale, respectively. Compared with 3,616 non-carers, 311 (7.9%) adolescent carers reported significantly higher Kessler Distress scores (baseline: 9.7 vs. 7.6; May 2020: 10.6 vs. 8.2; Sep/Oct 2020: 10.7

vs. 8.2; and Feb/Mar 2021 10.4 vs. 8.6) and lower Warwick-Edinburgh Mental Well-being scores (baseline: 21.4 vs. 22.4; May 2020: 20.1 vs. 21.4; Sep/Oct 2020: 20.0 vs. 21.5; and Feb/Mar 2021: 20.1 vs. 20.7) during the pandemic. Compared with non-carers, adolescent carers had significantly poorer sleep quality ($p < .001$) and more severe mental difficulties ($p < .001$); reported self-harm ($p < .001$), and suicide attempts ($p < .001$) more frequently. Compared with non-carers, adolescent carers included more non-White ethnicities, and reported significantly less sleep time at waves 1 ($p = .002$) and 3 ($p < .001$), less frequent outdoor spaces available at home at wave 1 ($p = .005$), lower scores for social support (p wave1 = .012, p wave2 = .010, p wave3 = .002) and higher scores for loneliness at all three waves (p wave1 < .001, p wave2 < .001, p wave3 < .001). Associations are largely explained by psycho-social factors at baseline. Existing inequalities among carers at 17 years of age appear to have affected mental health outcomes during the pandemic.

In Germany, Kurz et al. (2022) investigated wave t8 (>15th March 2020, before first Lockdown) and t9 (\leq 15th March 2020, one day before school-closure) of the SPATZ study, a German birth cohort. 362 First-graders (age 6-7 years) were analyzed and categorized in children undergoing the survey pre-pandemic or during the pandemic. First-graders during the pandemic showed lower health related quality of life and SDQ-scores than the first graders before the lockdown. Adjusted linear regression modelling showed statistically significant lower mean scores of short-term health-related quality of life among girls during vs. before the COVID-19 pandemic (b : 5.5, 95% CI [-9.0, -2.0]). Mean total difficulties scores (SDQ) increased in girls by 2.0 points (95% CI [0.2, 3.8]). In summary, health-related quality of life, and emotional and behavioral difficulties were worse in girls in the pandemic group. Only significant short-term effect in boys was screen time, which was higher in boys during vs. before the pandemic (plus 3.5 h).

Hoefnagels et al. (2022) assessed the impact of the pandemic on the mental wellbeing of children and adolescents with chronic conditions (aged 8-18 years) in the Netherlands. They compared data from chronic patients during the pandemic with data from chronic patients before the pandemic and with healthy peers during the pandemic. Data were retrieved from the longitudinal PROactive cohort study, a cohort in children with chronic disease, as well as the WHISTLER population cohort. Mental wellbeing was assessed by life satisfaction, internalizing symptoms, and psychosomatic health, using the Cantril ladder, the Revised Child Anxiety and Depression Scale (RCADS) and the Dutch Health Behaviour in School-Aged Children Symptom Checklist (HBSC-SCL). Results from the comparison between the two PROactive cohort samples of chronic children from before ($n = 944$, $M_{age} = 14.2$, $SD = 2.8$) and during ($n = 545$, $M_{age} = 14.3$, $SD = 2.9$) the pandemic show that life

satisfaction was significantly lower in chronic patients during the pandemic compared to chronic patients before the pandemic ($F(1, 1468) = 30.27; p < .001$). Female patients scored significantly lower in life satisfaction compared to male patients ($F(1, 1469) = 42.70; p < .001$). However, internalizing symptoms ($F(1, 1151) = 0.00; p = .96$) and psychosomatic health ($F(1, 1151) = 0.00; p = .40$) did not significantly differ during the pandemic compared to before the pandemic. Furthermore, children with a chronic condition ($n = 311, M_{\text{age}} = 15.7 (1.8)$) were compared to healthy peers ($n = 166, M_{\text{age}} = 16.0 (1.3)$) during the pandemic. Children with a chronic condition had a significantly lower life satisfaction score compared to their healthy peers ($F(1, 473) = 13.92; p < .001$), with female patients reporting lower life satisfaction than male patients ($F(1, 473) = 42.70; p < .001$).

A longitudinal study from Portugal (Meireles et al., 2022) compared adolescents' cognitive well-being — satisfaction with life (Brief Life Satisfaction Scale), social support (Scale of Satisfaction with Social Support), and quality of life (KIDSCREEN-10 Index) — before and during the COVID-19 pandemic in 1099 students aged between 12 and 16 years ($M_{\text{age}} = 12.80$ years; $SD = 0.73$).

Data were collected pre-pandemic between April and June 2019 (T1) and one year later during the pandemic between May and June 2020 (T2). At T2 the participants reported higher satisfaction with life ($M = 5.03, SD = 0.76$), compared with T1 ($M = 4.69, SD = 0.98$), ($p < .001$). For social support, a significant effect of time was observed, with participants scoring higher at T2 ($M = 3.76, SD = 0.54$), compared with T1 ($M = 3.44, SD = 0.60$) ($p < .001$). Another significant effect was found for quality of life with participants reporting a higher score at T2 ($M = 3.80, SD = 0.56$), compared with T1 ($M = 3.72, SD = 0.61$) ($p < .001$). Satisfaction with life and quality of life were perceived differently by female and male participants with boys reporting being more satisfied with their life and scoring higher in quality of life than girls at T2 as compared to higher scores in girls at T1.

In Austria, Kulcar et al. (2022) investigated the pandemic's effects on friendships and their role in successfully navigating the crisis in university students. Kulcar et al. combined a qualitative approach based on narratives and in-depth interviews and a quantitative approach based on online surveys focusing. In the 67 students who participated in both surveys, pandemic loneliness increased from $M = 2.75 (SD = 1.19)$ in April 2020 (Quan1) to $M = 3.15 (SD = 1.29)$ in November/December 2021 (Quan2). This corresponds to a small but significant effect ($t(66) = -2.50, p = 0.015, d = 0.32$). Likewise, wellbeing decreased from $M = 13.40 (SD = 4.99)$ to $M = 10.57 (SD = 6.03)$ in the repeated measure sample ($t(66) = 3.83, p < 0.001, d = 0.51$). Students who participated in only in Quan2 reported slightly lower wellbeing and lower pandemic loneliness than students who

participated also in Quan1 (wellbeing $M = 9.31$, $SD = 5.24$; loneliness $M = 3.40$, $SD = 1.23$), the difference was nonsignificant (wellbeing $t(89.40) = -1.58$, $p = 0.118$; loneliness $t(368) = 1.48$, $p = 0.140$). Wellbeing and pandemic loneliness correlated negatively during the first lockdown and after one and a half years of the pandemic ($r = -0.47$, $r = -0.45$; both $p < 0.001$). Wellbeing was negatively associated with pandemic loneliness and challenges with friendships during the pandemic. Already in Qual1, online socializing was not perceived as an adequate replacement for offline sociability by many participants, but this feeling was expressed even stronger in Qual4, during the second lockdown. The qualitative data collection rounds Qual3-5 throughout 2020, reports of overall reduced social contacts became more prevalent, and a persistent decline in the number of relationships the longer the pandemic lasted was seen. Participants described support by friends and different forms of instrumental support, such as creating online study groups.

Depression

Toseeb and Asbury (2022) assessed longitudinal trajectories of anxiety and depression symptoms in autistic children and adolescents and their parents during and after the first COVID-19 lockdown in the UK. 517 parents/carers of autistic young people (75%) and other special educational needs and disabilities (SENDs) aged 5-18 years ($M_{age} = 10.69$, $SD = 3.34$; 70% boys) filled out an online survey at one or more time points between March 23rd, and October 10th, 2020 (T1 = March 23rd - April 22nd, 2020; T2 = April 23rd - May 22nd, 2020; T3 = May 23rd - June 22nd, 2020; T4 = September 29th - October 10th, 2020). Given the high attrition rate, new participants were recruited at each measurement time point. Parents reported on their child's anxiety using the anxiety scale for children with autism spectrum disorder, and on their child's depression symptoms using the low mood subscale of the Revised Child Depression and Anxiety Scale. For the analysis, two mixed-effect regression models were fitted to the data. Results revealed that autistic young people had higher levels of depression and anxiety symptoms compared to young people with SENDs throughout the study period (Autism mean (SD): T1_{anxiety} = 35.16 (15.03), T2_{anxiety} = 36.40 (13.82), T3_{anxiety} = 35.38 (13.89), T4_{anxiety} = 35.24 (14.10); T1_{depression} = 11.46 (5.74), T2_{depression} = 12.17 (5.09), T3_{depression} = 11.76 (5.16), T4_{depression} = 11.40 (5.53); Send mean (SD): T1_{anxiety} = 28.63 (13.34), T2_{anxiety} = 29.75 (13.98), T3_{anxiety} = 27.51 (12.87), T4_{anxiety} = 24.48 (14.80); T1_{depression} = 9.97 (5.08), T2_{depression} = 11.40 (6.26), T3_{depression} = 9.87 (5.56), T4_{depression} = 9.02 (5.26)). The separate group models showed a significant main effect of time for young people with SENDs but not for

autistic young people, suggesting a decrease in anxiety symptoms between T1 and T4 for young people with SENDs while anxiety levels of autistic young people remained stable throughout the study period. There was no change in depression symptoms for either group during the study period.

In an additional article on the same study, Asbury and Toseeb (2022) draw on qualitative data from 478 parents/carers of autistic children and young people and those with SENDs to conduct a longitudinal qualitative content analysis examining change in the mental health of these young people. They asked parents/carers a single open-ended question about their child's mental health at all four timepoints. "Psychological distress" and "worry" were dominant themes at all timepoints and qualitative data indicated that worry in autistic pupils stayed stable over time but decreased for those with SENDs, which is in line with the quantitative findings. The third dominant theme was "well-being," and there was evidence that the removal of requirements (like attending school) improved well-being for a significant minority of, especially autistic, students.

In a longitudinal study based on a probability sample of the Dutch population, Van der Velden et al. (2022) examined the impact of the COVID-19 pandemic on the risk of mental health problems in 830 adolescents nine months after the outbreak. For this purpose, they compared the prevalence and incidence of mental health problems in adolescents aged 16–20 from the 2020 cohort (November-December 2020; $N = 251$) with the prevalence and incidence in adolescents from the 2012 (November-December 2012; $N = 346$) and the 2016 cohort (November-December 2016; $N = 253$). Results revealed that the prevalence of moderate anxiety and depression symptoms that were measured using the Mental Health Inventory (MHI-5) was significantly higher in the 2020 cohort (31.9%) than in the 2012 (24.0%) and 2016 (20.2%) cohort, while the prevalence of severe anxiety and depression symptoms was also higher in the 2020 (13.1%) than in the 2016 cohort (6.3%), but not compared to the 2012 cohort (9.5%). However, the differences in the mean scores were small or absent. The use of mental health services was significantly higher in the 2020 cohort (16.3%) than both the 2012 (5.8%) and the 2016 cohort (9.9%). However, a trend of higher use of mental health services was already observed in the 2016 cohort compared to the 2012 cohort ($p < .10$). The prevalence of sleep problems and fatigue did not differ between the three cohorts. The results of an ANOVA showed that the total scores of anxiety and depression symptoms did not differ between the 2020 ($M = 66.3$, $SD = 17.4$) and the 2012 cohort ($M = 68.9$, $SD = 16.8$) and only slightly between the 2020 and the 2016 cohort ($M = 70.7$, $SD = 15.4$), with the 2020 cohort showing significantly lower scores than the 2016 cohort ($F(1, 503) = 9.64$, $p = .002$; Cohen's $d = 0.27$), which indicates higher symptoms levels. Lastly, results of multivariate logistic regression analyses

revealed no significant differences between the three cohorts in the incidence of mental health problems.

Panteli et al. (2022) examined in a two-wave longitudinal study how the lockdown affected Greek-Cypriot college students with and without internalizing psychopathology. 106 students ($M_{\text{age}} = 21.60$, $SD = 3.43$ years, 82.1% females) answered measures of affective experiences (using the Positive Affect and Negative Affect Schedule - PANAS), mental health (using the Psychiatric and Diagnostic Screening Questionnaire - PDSQ), perceived stress (using the Perceived Stress Scale - PSS) and quality of life (using The World Health Organization Quality of Life-BREF - WHOQoL-BREF) during pre-pandemic (May–June 2019) and lockdown periods (mid-April – early-May 2020). The number of internalizing symptoms did not show significant differences between pre-pandemic and lockdown periods, supporting the stability of internalizing symptomatology (Wilks' Lambda = 0.999, $F(1, 105) = 0.94$, $p = .760$, $\eta_p^2 = .001$). An effect of time on positive affect was found, showing a decrease in positive affect from pre-pandemic levels to lockdown (pre-pandemic positive affect: $M = 35.33$, $SE = 0.74$, lockdown period positive affect: $M = 30.68$, $SE = 0.99$), Wilks' Lambda = 0.849, $F(1, 104) = 18.56$, $p < .001$, $\eta_p^2 = .151$). No difference was found between the participants with or without internalizing pathology ($p = .781$). For negative affect no significant differences were found between pre-pandemic and lockdown periods (Wilks' Lambda = 0.994, $F(1, 104) = 0.58$, $p = .447$, $\eta_p^2 = .002$). QoL was reduced in both groups at T2 versus T1 (Wilks' Lambda = 0.937, $F(1, 86) = 5.83$, $p = .018$, $\eta_p^2 = .063$). At the same time, physical health (Wilks' Lambda = 0.844, $F(1, 86) = 15.93$, $p < .001$, $\eta_p^2 = .156$), and psychological health (Wilks' Lambda = 0.95, $F(1, 86) = 4.48$, $p = .037$, $\eta_p^2 = .05$) were reduced from T1 to T2. Here as well, no significant difference was found between participants with or without internalizing pathology before the pandemic.

Vacaru et al., (2022) investigated whether internalizing symptoms and family functioning predict depressive symptoms in adolescents during the first Dutch COVID-19 lockdown in a low-risk community sample. Participants were part of an ongoing prospective study on child development. 115 adolescents ($M_{\text{age}} = 13$ years, 44% girls) and 111 of their parents filled in online surveys. During the first COVID-19 lockdown, 24% percent of adolescents reported clinically relevant symptoms of depression. Depressive symptoms as assessed with the Center for Epidemiological Studies Depression Scale for Children were significantly predicted by internalizing, but not externalizing symptoms that were assessed earlier in 2019 with the Strengths and Difficulties Questionnaire. Chi-square analyses showed non-significant sex differences on clinically relevant internalizing, externalizing and depressive symptoms (all $p > .281$). However, correlation analyses

indicated that at a continuous level, sex was significantly associated with internalizing symptoms ($r = -.23$, $p = .015$) and depressive ($r = -.21$, $p = .024$) symptoms. These findings suggest that girls have higher scores of internalizing [$t(107) = 2.48$, $p = .015$] and depressive symptoms [$t(114) = 2.29$, $p = .024$] compared to boys. Modest positive correlation also emerged between internalizing and externalizing symptoms ($r = .31$, $p = .001$), suggesting that adolescents with higher internalizing symptoms also show higher externalizing symptoms. Regression analysis also showed significant main effects of internalizing symptoms [$\beta = 0.02$, $t(104) = 2.21$, $p = .029$] and family functioning [$\beta = -0.18$, $t(104) = -2.56$, $p = .012$], indicating that higher internalizing symptoms one year before the lockdown were associated with increased adolescents depressive symptoms. Better family functioning, however, was associated with lower depressive symptoms thus suggesting that is served as protective factor. There was no association between depressive symptoms and externalizing symptoms or peer connectedness.

Joensen et al. (2022) examined changes in young people's mental health from before to during the first and second lockdown in Denmark and assessed whether female participants and those with pre-existing depressive symptoms were disproportionately impacted.

Building on data from the Danish National Birth Cohort (DNBC) survey, that assessed depression symptoms using the Major Depression Inventory (MDI) before 2020, participants aged 18–24 years filled in eight COVID-19 questionnaires over the course of the COVID-19 pandemic. In the COVID-19 questionnaires, they reported on their quality of life (QoL) using the Cantril Ladder scale, mental well-being using the 7-item Short Warwick-Edinburgh Mental Well-Being Scale (SWEMWBS), and loneliness using the items from the Danish National Birth Cohort (DNBC) survey. During the pandemic, COVID-19 data was collected at 8 points: wave 1-7 during the first lockdown between March 30th and May 31st, 2020, and wave 8 one year later in April/May 2021. 32'985 participants completed the DNBC-18 and of these, 7431 and 8808, respectively, participated in wave 1 and wave 8 of the COVID-19 survey. Worsening of mental well-being, loneliness and QoL was observed during the strictest phase of the initial lockdown. Mental well-being and loneliness reached the before levels one year post the initial lockdown (wave 8), while the QoL never normalized and remained at lower levels in spring 2021. Comparable effects were found for men and women. Mental well-being dropped -0.63 (95% CI $[-0.71; -0.55]$) for women and -0.59 (95% CI $[-0.67; -0.50]$) for men. The proportion of participants who reported feeling lonely increased by 8.0% (95% CI $[7.0; 9.0\%]$) for women and 6.0% (95% CI $[5.0; 7.0\%]$) for men. QoL deteriorated slightly more in women (-1.12 , 95% CI $[-1.17; -1.07]$) than men (-0.85 , 95% CI $[-0.90; -0.80]$). Together, participants without

pre-existing depressive symptoms were most likely to be affected by deterioration of their scores. For young people with pre-existing depressive symptoms, however, mental well-being, loneliness, and QoL improved, especially for male participants.

Mental Distress / Stress

The longitudinal cohort study from Shanahan (2022) measured emotional distress (perceived stress, internalizing symptoms, and anger), COVID-19-related stressors, and coping strategies during the pandemic/lockdown when participants were aged 22. Previous distress and stressors were measured before COVID-19 (at age 20). Young adults' mean perceived stress levels and anger were higher during the pandemic compared to the pre-pandemic assessment ($p < .001$). The mean of internalizing symptoms decreased ($p < .001$). Females were at higher risk of each of the three emotional distress indicators. Having a migrant background was associated with more perceived stress. In addition, pre-pandemic social stressors, stressful life events, low generalized trust, poor self-rated health, and concurrent pandemic-related stressors (i.e. during-pandemic lifestyle and economic disruptions, loss of occupation/education) and other risks (e.g. hopelessness and low trust in responses) were associated with during-pandemic distress. Frequent news-seeking was associated with perceived stress and anger. Health risks to self and loved ones during the pandemic generally had small or no associations with distress. Those with previous emotional distress were at considerably increased risk of during-pandemic emotional distress; internalizing symptoms had the highest stability among the distress indicators. With the inclusion of previous emotional distress the size of the coefficient for female sex was reduced by about half. The inclusion of previous distress reduced the size of some associations between pre-pandemic stressors (e.g. low social support) and during-pandemic distress, but pre-pandemic bullying victimization, stressful life events, perceived social exclusion, and low self-rated health still predicted pre- to during-pandemic increases in emotional distress. Many during-pandemic/lockdown stressors, including lifestyle and economic disruptions and loss of education or employment, were associated with greater increases in emotional distress.

Behavioral/emotional (affective) disorders

The study from Moulin et al. (2022) investigates the association between family socioeconomic status (SES) and children' mental health during the period of school closure in 2020 due to COVID-19. Data came from 4'575 children aged 8–9 years who were part of the ELFE population-based birth cohort that focuses on children's health, development, and socialization. Parents completed

the Strengths and Difficulties Questionnaire (SDQ) when children were 5 as well as 9 years of age. The latter completion period corresponded to the school closures due to the COVID-19 pandemic in France. Having high symptom levels of Attention-deficit/Hyperactivity disorder (ADHD) symptoms during the period of school closure was significantly associated with prior low family SES (adjusted Odds Ratio (aOR) 1.26, 95% CI [1.08–1.48]). Elevated symptoms of hyperactivity/inattention and of emotional symptoms were associated with a decline in income during the COVID-19 crisis (aOR 1.38, 95% CI [1.16–1.63]) and aOR 1.23, 95% CI [1.01–1.51], respectively). Moreover, whereas a prior low or very low SES in general was not significantly associated with emotional symptoms during school closure (aOR 1.12 [0.92–1.36]), a low prior SES in families who experienced a decline in income was associated with a higher risk of emotional symptoms of their children (aOR 1.54 [1.07–2.21]), while gender, parental separation and prior mental health difficulties were not associated.

Hall et al. (2022) assessed the impact of COVID-19 on young people with tic disorders aged 9–17 years in the UK ($N = 112$; $M_{age} = 12.4$, $SD = 2.1$). The sample consisted of 112 participants (78% male) randomized to the control arm of the “ORBIT-Trial” and split into two groups: the *pre-COVID group* and the *during COVID group*. The *pre-COVID group* was followed up to 12-months’ post-randomization before the pandemic (May 17th, 2019 to March 19th, 2020, $n = 44$); the *during-COVID group* was impacted by the pandemic at the 12-month follow-up (March 23rd, 2020 to October 29th, 2020, $n = 47$). Data from the remaining 21 participants (18%) were missing at the 12-month follow-up. Mixed effects linear regression modelling revealed no significant differences in tic severity, impairment, or complexity between the participants from the *pre-COVID* and *during-COVID group*. This finding was not affected by age or gender, symptoms of anxiety or autism spectrum disorder status. Therefore, no evidence was found that the pandemic did impact existing tic symptoms.

Substance use

Zysset et al. (2022) examined alcohol consumption and binge drinking in university students ($N=947$) early in the pandemic (April to June 2020) in Switzerland. Students filled in an online survey. Data from the first survey and at least one follow-up was included in the analyses. Overall, 20% of university students reported an increased alcohol consumption and 26% reported that they engaged in binge drinking. Number of drinks at baseline was associated with a higher probability of increased alcohol consumption (OR 1.04, 95% CI [1.03, 1.06]), as well as engaging in single (OR

1.08, 95% CI [1.05, 1.10]) and multiple binge drinking events (OR 1.08, 95% CI [1.06, 1.09]). Higher anxiety scores were associated with a higher probability to increase the alcohol consumption (OR 1.06, 95% CI [1.01, 1.11]) and engaging at least once in binge drinking (OR 1.06, 95% CI [1.01, 1.12]). Additional factors associated with any binge drinking were male gender, younger age and not living with parents. Higher perceived social support as measured by the Oslo-3 Social Support Scale was only associated with an increased likelihood of engaging in heavy binge drinking although this finding should be interpreted with caution given the small number of heavy binge drinking students in the sample (n=61).

In a retrospective, monocentric cohort study, Spinelli et al. (2022), compared routine care toxicology biological tests from 11'786 patients older than 12 years of age that were hospitalized in intensive care units (ICU) or the emergency ward (EW) of a hospital in France from 2018 to 2020. The frequency of psychoactive substance poly-exposures increased during the lockdown periods (March 17th - May 11th, 2020, and October 29th - December 15th, 2020) among 12–25-year-old patients (OR 1.69 (1.07–2.31), $p = .016$).

Eating Disorder

Cerniglia and Cimino (2022) assessed the prevalence of eating disorders and internalizing / externalizing problems in 813 adolescents in Italy before and during the COVID-19 pandemic using the Eating Attitudes Test-26 (EAT-26) as well as the SCOFF (Sick, Control, One, Fat, Food) and Youth self-report (YSR) questionnaires at two assessment points in October 2019 (T1; at school; $M_{age} = 14.4$; $SD = 0.9$) and April 2020 (T2; online; $M_{age} = 15.6$; $SD = 1.1$).

From T1 to T2, the percentage of male and female adolescents with eating disorders increased from 13.2% to 18.4% and from 17.5% to 25.3% respectively. Furthermore, ANOVA analyses and subsequent Bonferroni's post hoc tests showed that for males and females the YSR scores were significantly lower at T1 than at T2, especially for the subscales of "Withdrawn" ($M_{T1male} = 5.41$ (1.42), $M_{T2male} = 8.14$ (1.38); $M_{T1female} = 6.18$ (1.28), $M_{T2female} = 9.53$ (1.43)), "Somatic complaints" ($M_{T1male} = 7.57$ (1.22), $M_{T2male} = 9.72$ (1.65); $M_{T1female} = 8.43$ (1.25), $M_{T2female} = 10.26$ (1.15)), "Anxious/depressed" ($M_{T1male} = 6.87$ (2.12), $M_{T2male} = 12.25$ (3.75); $M_{T1female} = 8.03$ (2.45), $M_{T2female} = 13.53$ (4.43)), "Social problems" ($M_{T1male} = 5.13$ (2.41), $M_{T2male} = 7.19$ (1.38); $M_{T1female} = 6.03$ (1.65), $M_{T2female} = 8.31$ (1.57)) and additionally for males "Aggressive behavior" ($M_{T1male} = 11.34$ (2.26), $M_{T2male} = 15.36$ (2.85)). Furthermore, both groups showed higher maladaptive scores at T2 on the

internalizing subscale ($M_{T1\text{male}} = 15.18 (4.25)$, $M_{T2\text{male}} = 22.45 (3.55)$; ($M_{T1\text{female}} = 17.23 (3.15)$, $M_{T2\text{female}} = 27.21 (2.41)$), while a significant change on the externalizing subscales were only found for males ($M_{T1\text{male}} = 12.27 (1.53)$, $M_{T2\text{male}} = 19.37 (4.45)$). EAT-26 scores for both male and female adolescents were significantly lower at T1 than at T2 for all three subscales of “Dieting” ($M_{T1\text{male}} = 8.31 (3.12)$, $M_{T2\text{male}} = 9.43 (4.21)$; $M_{T1\text{female}} = 12.24 (3.42)$, $M_{T2\text{female}} = 14.81 (5.54)$); “Bulimia/Food Preoccupation” ($M_{T1\text{male}} = 2.91 (2.65)$, $M_{T2\text{male}} = 3.41 (2.01)$; $M_{T1\text{female}} = 3.33 (2.78)$, $M_{T2\text{female}} = 4.67 (2.87)$) and “Oral Control” ($M_{T1\text{male}} = 4.32(3.1)$, $M_{T2\text{male}} = 6.54 (4.71)^*$; $M_{T1\text{female}} = 5.53 (3.43)$, $M_{T2\text{female}} = 7.92 (4.56)$).

The study on Italian adolescents from Pace et al. (2022) measured a set of symptoms and emotion-related risk-factors in two steps during the COVID-19 pandemic: T1, from April 10th to May 22nd, 2020 and T2, from September 10th to October 19th, 2020. Data was collected with an online survey that included several self-report measures assessing internalizing and externalizing symptoms (Youth Self Report (YSR)), social media disorder (Social Media Disorder Scale (SMDS)), binge eating (Binge Eating Scale (BES)), Alexithymia (Toronto Alexithymia Scale 20-items (TAS-20)) and expressive suppression (Emotion Regulation Questionnaire for Children and Adolescents (ERQ-CA)). A significant decrease in total and internalizing problems (T1: 13.88 (8.50), T2: 9.08 (8.51)), and social media disorder symptoms (T1: 2.52 (2.09), T2: 1.29 (2.19)) from T1 to T2 was found while externalizing problems (T1: 9.73 (6.51), T2: 7.02 (6.50)) and binge eating scores (T1: 6.53 (6.3), T2: 6.45 (5.99)) did not significantly differ between T1 and T2. Additionally, analyses showed that both total alexithymia (T1: 53.47 (10.64), T2: 37.58 (23.12)) and expressive suppression scores (T1: 7.77 (3.36), T2: 5.55 (4.18)) significantly decreased between T1 and T2. results indicated that the TAS-20 total score was significantly and positively correlated with YSR (total, internalizing and externalizing scores) and SMDS scores both at T1 and T2, and with BES scores only at T1. Moreover, ERQ-CA_ES score was significantly and positively correlated with both SMDS and BES scores only at T1, and with YSR scores (total, internalizing and externalizing) only at T2.

Ioannidis et al. (2022) examined the longitudinal impact of the COVID-19 pandemic and associating factors with eating disorders (ED) in young adults in the UK. The first wave of data collection took part September 2017 to September 2018 (T1), the second wave of data collection took part May to July 2020 (T2). Together, 489 individuals that completed both T1 and T2 surveys were included in the study ($M_{\text{age}} = 23.4$ years, $SD = 3.3$; with ED $n = 93$). Hierarchical generalized logistic regression was used to analyze the data. In the 7th and final step (M7, 37 predictors) the results of the SCOFF Eating Disorder Questionnaire (SCOFF) revealed that “eating disorder at T1 was strongly

associated with the ED T2 outcome (SCOFF ≥ 2 at T2; $z = 5.93$ $p < .001$).” Moreover, more conflict at home as measured by the Pandemic General Impact scale (PD-GIS, Factor E; $z = 2.03$ $p < .05$), lower sensation seeking at T1 ($z = -2.58$ $p < .01$) and higher lack of perseverance (impulsivity) at time T2 ($z = 2.33$ $p < .05$) were also significantly associated with the ED outcome.

Mental Health Care Utilization

The study by Allgaier et al. (2022) investigated the change in emergency visits and patient contact in the Tübingen university clinic for child and adolescent psychotherapy and psychiatry (Abteilung Psychiatrie, Psychosomatik und Psychotherapie im Kindes- und Jugendalter, Universitätsklinik für Psychiatrie und Psychotherapie (KJPPP)) Tübingen in Germany in the second COVID-19 wave (01.10.2020 - 31.01.2021) compared to the previous year (01.10.2019 - 31.01.2020). The number of emergencies, the type of contact, age structure, and the diagnoses of eating disorders and obsessive-compulsive disorders were evaluated. A total increase by 29.7% across all emergency contact types was observed (246 to 319). For emergency phone calls, there was a 29.4% increase (126 to 163); for emergency outpatient presentations, there was a 33.3% increase (48 to 64); and the number of emergency inpatient admissions increased by 27.8% (72 to 92). Correspondingly, the number of children and adolescents who contacted the emergency department increased by 10.3% from 156 to 172 children and adolescents with similar increases as in the overall contact number by conduct type. At the level of emergency presentations, the average age increased descriptively for all contact types. Overall, there was a significant increase of 0.67 years from 14.32 to 14.99 years, with the largest age change in case of outpatient presentations, with an average age increase of 1.40 years in the second period than in the first. The total number of emergency inpatient admissions showed an increase of 27.9% (61 to 78), predominantly younger age group. The total number of emergency contacts with an eating disorder diagnosis was significantly higher in the second period (5 to 24 contacts). The number of patients diagnosed with OCD was smaller in the second period (9 to 2).

The study by Jollant et al. (2022) compared the number of monthly self-harm hospitalizations between Jan.- 2019 Aug. 21. Data were extracted from the French national hospital database (PMSI). All patients aged 10 years or older (including adults), who were hospitalized for self-harm in medicine/surgery/obstetrics in France (ICD-10 code X60 to X84) were registered as an associated diagnosis. The main self-harming means used were drug overdose (72.4%) and use of sharp objects (10.7%). Overall, there were fewer self-harm hospitalizations during the pandemic

period as compared to the pre-pandemic period: 85,679 versus 88,782 (3,103 representing 3.5%; $RR = 0.97$ (95% CI [0.96, 0.97]; $p < .0001$). A significant decrease was found for men (8.0%; $RR = 0.92$ [0.91, 0.93]; $p < .0001$) but not women (0.6%; $RR = 0.99$ [0.98, 1.01]; $p = .5$). Adults showed a stronger decrease in the beginning of the pandemic and continuous but less strong decrease later in the pandemic. Men represented 88.9% of the global decrease in numbers during this period. A large increase in hospitalizations due to self-harm in women was observed in the age group 10–19 years ($p27.7\%$, $RR = 1.28$ [1.25, 1.31]; $p < .0001$), while the hospitalizations were stable for men of the same age-group, as well as for both sexes of the age-group 20 – 29 yrs.. When focusing on 10–19-year-old female adolescents, the annual trends in self-harm hospitalizations showed the expected seasonal pattern (lowest in summer, highest in winter and spring), but a more marked increase during winter and spring 2021 versus 2019. It was followed by a decrease during summer 2021, although higher than in summer 2019 and 2020. Finally, across all ages a significant decrease in admissions to intensive care units was found compared to 2019, while no change in the number of deaths in hospital following self-harm was observed. In adolescent girls, however, the number of intensive care unit hospitalizations increased during the studied period versus 2019 ($p20.6\%$; $RR = 1.21$ [1.05, 1.39]; $p < .05$).

The study from Llorca-Bofi et al. (2022) assessed visits to the Psychiatric Emergency Department of Santa Maria University Hospital in Lleida of young patients, < 18 years old, before and after the pandemic with special attention to the two lockdowns (13. Jan 2020 - 14. Mar. 2020; first lockdown: 15. Mar. 2020 - 20. Jun. 2020 and second lockdown: 25. Oct. 2020 - 9. May. 2021) and suicidal behavior. Digital medical records indicate that during second lockdown young patients represent 11% of all psychiatric emergency visits, illustrating an 83.5% increase in young visits compared to the two previous periods studied, when only 6.2% of the visits were from young people ($p = .001$). It was also found a decrease in age ($p = .006$), a greater proportion of patients who lived with relatives ($p = .004$) and a lower proportion of institutionalized patients ($p = .002$). Regarding the chief complaints, behavioral disturbance decreased ($p = .001$) and anxious decompensation increased ($p = .015$) in the second lockdown. There was a decrease in childhood-onset disorders in both states of alarm ($p = 0.018$), a decrease in patients without diagnosis of personality disorders or intellectual disorders (axis II diagnoses) in the first state of alarm ($p = 0.014$) and a decrease of personality disorder diagnoses in the second state of alarm ($p = 0.004$) without significant variations in the rest of the diagnoses. Suicidal ideation increased during the two lockdowns without reaching statistical significance ($p = .073$), and hospitalizations due to suicidal behavior increased. 91 (26.6%) presented some type of suicidal behavior (45 suicidal ideation, 46 suicide attempt). Significant

factors ($p < 0.01$) associated with a higher risk of suicidal behavior in multivariate regression were female gender, living with relatives, and depressive symptoms.

Antonucci et al. (2022) conducted a retrospective study of pediatric ED visits of patients <16 years old between January-June 2019 and the same period in 2020 at two pediatric EDs in Italy. The total number of ED visits fell from 15,692 (2019) to 8,399 (2020) (-46.5%). However, comparing the months March-April and May to June with the corresponding period in 2019 the reduction was 79% and 78% respectively. A higher proportion of trauma (14% [1177] vs. 10.4% [1629]; $p < .0001$), intoxication (1.1% [93] vs. 0.5% [78]; $p < .0001$) and neuropsychiatric disease (4.8% [406] vs. 4.1% [650]; $p = .01$) were recorded during the first semester of 2020 compared to the same period in 2019. During the lockdown, there was an increased rate of visits for trauma (17.7% [211] vs. 9.6% [518]; $p < .0001$) and intoxication (1.5% [18] vs. 0.5% [27]; $p < .0001$), as compared to March-April 2019. Children age <2 years showed lower reduction rates. No increase in severity was recorded.

In a retrospective review, Spina et al. (2022) analyzed demographic and clinical profiles of children and adolescents (<18 years) presenting with an eating disorder (ED) in the ED between March 2019 and March 2021. In total, 211 admissions ($N_{\text{Pre-COVID-19}} = 96$; $N_{\text{Post-COVID-19}} = 115$) were recorded, with the patients being mostly females (86.3%) and having a mean age of 14.1 years (age range: 5.3–17.9). The proportion of patients being hospitalized was significantly higher during the COVID-19 period than in the pre-pandemic time (78.3% vs. 57.3%; $p = .001$), although the time being hospitalized was significantly shorter during the pandemic (19 ± 12 vs. 26 ± 17 days; $p = .004$). In terms of weight loss or BMI, no significant differences were observed between the two groups. During the COVID-19 pandemic, significantly more patients were diagnosed with psychiatric disorder comorbidities (23.5% vs. 8.3%; $p = .003$). Moreover, patients admitted during the COVID-19 pandemic were also more often requiring a drug therapy (71.3% vs. 46.9%; $p = .048$) or intravenous fluids (72.2% vs. 52.1%; $p = .004$). A multivariate analysis adjusted for age and gender showed that a shorter hospitalization period, a psychiatric comorbidity and an increased value of serum creatinine were significantly associated with admission for an eating disorder during the COVID-19 pandemic.

Ayraler Taner et al. (2022) examined the changes in admission to a child and adolescent psychiatry outpatient clinic (CAPOC) in Turkey between March 2019 and March 2021. Information was obtained from the electronic medical record system. Results show a decrease in CAPOC admissions during the pandemic period with 4708 admissions between March 2019 and March

2020, and 3172 admissions between March 2020 and March 2021. However, compared with the pre-pandemic period, the proportion of admissions for female patients increased significantly during the pandemic ($\chi^2 = 11.6$, $df (1)$, $p < .001$), especially in first-time admissions. Diagnoses of obsessive-compulsive disorders, more frequent in males, and somatic symptom-related disorders, more frequent in females, increased (both $p < .001$), while there was a decrease in diagnoses of ADHD, conduct disorder, intellectual disability and specific learning difficulties during the pandemic period ($p = .002$, $p < .001$, $p = .042$, and $p < .001$, respectively).

Overall Health – Studies with multiple outcome measures

Three studies assessed several outcomes that were relevant for the present review. As these studies provide insights into the associations between the different outcomes, they are reported in a separate section rather than listing each outcome in the respective outcome sections. The findings are also taken into account in the general summary.

The first study by Pedrini et al. (2022) assessed psychopathological symptoms (anxiety, depression, stress, emotional dysregulation, maladaptive behaviors) in a sample of $N = 153$ adolescent students, living in a medium-size city in the north of Italy, at two time points (T0 and T1): before the outbreak of the Covid-19 pandemic (November 2019–January 2020) and 1 year later (April–May 2021). They explored the association between mental health indexes, potential risk and resilience factors (i.e., childhood trauma, emotional regulation skills, family function, and personality traits). There was an increase of anxiety symptoms as detected by the Screen for child anxiety related emotional disorders (SCARED) questionnaire's total mean score ($p = .002$), and its generalized anxiety ($p = .001$) and school anxiety ($p < .001$) subscales. According to the Adolescent Stress Questionnaire (ASQ)'s results, there was an overall reduction of the amount of perceived stress during last year. Less stress was perceived in home life ($p < .001$), school attendance ($p < .001$), romantic relationships ($p < .001$), peer pressure ($p < .001$), and financial pressure ($p < .001$), but more stress was perceived regarding the uncertainty about the future ($p = .002$). There was no significant difference in PHQ-9's total mean depression score between the measurements. However, half of the participants below cut-off at T0 were above cut-off for depression at T1. Results also show a significant increase in the proportion of students reporting unprotected sex ($p = .027$), self-harm ideation ($p = .005$), self-harm behaviors ($p = .021$), binge eating episodes ($p = .001$), and aggressive behaviors ($p = .003$). Participants who reported increased frequency of self-

harm ideation ($p < .001$), self-harm behaviors ($p < .001$), binge-drinking ($p = .005$), aggressiveness ($p = .003$), and binge-eating ($p = .003$) were more likely to be worsened on mental health indexes even after controlling for clinical status of mental health at baseline, gender, socio-economic status (SES) and COVID-19 experience.

The second study, a population-based, prospective cohort study by Camerini et al. (2022) focused on screen time and green time, two activities likely to have been affected by the containment measures during the COVID-19 pandemic. Furthermore, they investigated what impact these factors had on the mental health of children and adolescents in Switzerland. The sample consisted of 844 participants aged between 5 and 19 years ($M_{age} = 12.8$ years, $SD = 4$ years), who took part in the Corona Immunitas Ticino study, data was collected between autumn 2020 and spring 2021 (Baseline: September - November 2020 (BL); monthly (M) follow-up questionnaires considered in this study: M1, M3, M5 and M6). Screen time (ST) was assessed with four open-ended questions about duration (hours/weekdays/weekend) and purpose (school-related activities) of screen time. Green time (GT) was assessed with two open-ended questions about time spent outdoors in nature at weekdays and weekend days respectively. Mental health was assessed at M6 using seven subdomains from the DSM-5 cross-cutting symptoms measure (DSM-5): somatic symptoms, sleep problems, inattention, depression, anger, irritability, and anxiety. For Green Time, results indicated a downward trend between M1 ($M_{GT M1} (SD) = 2.04 (1.46)$) and M3 ($M_{GT M3} (SD) = 1.76 (1.08)$), but stable values between M3 and M5 ($M_{GT M5} (SD) = 1.73 (0.97)$). On average, participants spent 2 hours outside in M1, and approximately 1:45 hours in M2 and M3. For Screen Time, results indicated no change between M1 and M5 ($M_{ST M1} (SD) = 2.63 (2.04)$; $M_{ST M3} = 2.66 (2.02)$; $M_{ST M5} = 2.58 (1.96)$). Participants spent, on average, approximately 2 hours and 40 minutes in front of screens for leisure activities at each time point, with 5- to 9-year-olds spending from approximately 1 hour and 20 minutes, 10- to 14-year-olds spending about 2 hours, and adolescents aged 15 or older spending 4 hours and 20 minutes in front of screens. Regarding the relation between GT and ST, only for M5, a weak negative association was found. Higher levels of GT were related to lower levels of mental health problems ($B = -0.416$, $p = .033$), whereas higher levels of ST were related to higher levels of mental health problems ($B = 0.249$, $p < .001$). Being female ($r = 0.181$, $p < .01$) and being older ($r = 0.444$, $p < .01$) was significantly and positively associated with mental health problems at assessment M6.

In the third study, Hafstad et al. (2022) conducted “a nationwide three-wave survey in a representative sample of 12–16-year old in Norway, with baseline data collected in January 2019 ($n = 9'240$; 49% girls) and follow-ups in June 2020 ($n = 3'564$; 49% girls) and June 2021 ($n = 3'540$; 47% girls)”. The total sample showed a nonlinear development over time, reflecting a flat trend from 2019 to 2020, followed by an increase in mental health symptoms from 2020 to 2021 (Predicted value at T1 .56 [95% CI .55,0.58], T1-T2 difference $-.04$ [95% CI .07,.02], T2-T3 difference .12 [95% CI .09,0.14]. Girls had a significantly larger increase in mental health symptoms before the pandemic and throughout the period compared to boys. Somatic health complaints throughout the pandemic showed a flat trend from 2019 to 2020, followed by an increasing trajectory of somatic health complaints from 2020 to 2021 (Predicted value at T1.59 [95% CI .58, .61], T1-T2 slope $-.09$ [95% CI $-.11, -.65$], T2-T3 slope .18 [95% CI .15, .21]). Girls also experienced a significantly greater increase in somatic health complaints from prior to the pandemic and throughout the period than boys. Pre-pandemic mental health problems, female gender, living in a single-parent household, and abuse exposure significantly predicted higher mental health scores at T3.

Results from Phase I / II

QoL/Life satisfaction

A study from Turkey (Onal et al., 2021) looked at the **change in quality of life (QoL)** and occupational performance in **children with cancer** during the Covid-19 pandemic. For the quantitative part of the study two assessments were carried out on 60 children ($M_{age} = 8.9$ years; $SD = 1.5$ years) and their families. The first in April of 2020, the second in September 2020. The pediatric quality of life inventory parent proxy-report was used to evaluate the QoL, and the Canadian occupational performance measurement was used to evaluate children's occupational performance (OP) and satisfaction. The results show a significant decrease on QoL during the pandemic: QoL-parameters such as cognitive state, perceived physical appearance and communication skills decreased significantly by 13.7, 7.1, and 22.1 points respectively, $p < .05$. Procedural anxiety and treatment anxiety of children during treatment increased. Furthermore, both the occupational performance and satisfaction of the children decreased significantly in the 6-month period, $p < .01$. The occupational performance score decreased from 5.5 ($SD = 1.1$) points pre-pandemic to 3.9 ($SD = 1.3$) points. The satisfaction score dropped from 4.8* ($SD = 1.2$) to 2.2

(SD = 1.3) points. No statistical change in the pain-related conditions of the children within 6 months of the pandemic was found, $p > .05$. [** Numbers (M and SD) for satisfaction before COVID-19 are not consistent in text and table. In the text, the mean (standard deviation) for satisfaction before COVID-19 is M = 4.8 (SD = 1.2) and in table it is M = 3.8 (SD = 1.3).*]

Van Gorp et al. (2020) studied the psychosocial impact of the start of the COVID-19 pandemic on Dutch **children with cancer in outpatient care** (pre-COVID-19/COVID-19 period: $n = 494/438$) and their caregivers ($n = 799$). Quality of life data was collected through health-related quality of life (HRQoL) and pediatric quality of life inventory (PedsQL) generic and multidimensional fatigue scales between January and June 2020. A minimum of parents participated twice. Adjusted analyses show **psychosocial functioning** of children with cancer did not deteriorate in the initial phase of COVID-19. The only observed difference was a decrease in the level of distress in the caregivers (OR = 0.59, 95% CI [0.42, 0.83], $p = .002$). [the exact number of participants is not clearly reported, while the N for each outcome is].

A Swiss study by Ehrler et al. (2021) at the University Children's Hospital Zurich investigated children with increased risk of neurodevelopmental impairment (children with congenital heart disease = 73, children born very preterm = 54) aged 10 to 16 years in comparison to typically developing children (TD = 73) and provides pre- and in pandemic data (April 17th – May on **well-being** and family functioning. They observed a small to medium effect that psychological well-being decreased ($B = -5.05$, 95% CI [-6.63, -3.47], $p < .001$), independent of group. During the pandemic, psychological well-being was significantly lower than the norm ($M = 45.6$, 95% CI [44.01, 47.14], $p < .001$) whereas it had not differed from the norm before the pandemic ($M = 50.6$, 95% CI [49.06, 52.08], $p = .458$). A third of the children lay below the norm threshold compared to 11% prior the pandemic. Parent relationship and autonomy did not differ from the norm at either time point (Ehrler et al., 2021).

The study by Evans et al. (2021) used longitudinal data to characterize effects on mental health and behavior in a UK student sample, measuring **sleep quality** and diurnal preference, **depression** and **anxiety symptoms, wellbeing and loneliness**, and **alcohol use**. Self-report data was collected from 254 undergraduates (219 females) at a university at two-time points: autumn 2019 (baseline, prepandemic) and April/May 2020 (under 'lockdown' conditions). Longitudinal analyses showed a significant rise in depression symptoms ($p < .001$) and a reduction in wellbeing ($p < .001$) at lockdown. Over a third of the sample could be classified as clinically depressed at lockdown

compared to 15% at baseline. The increase in depression symptoms was highly correlated with worsened sleep quality, $p < .001$.

Albrecht et al. (2022) investigated the association between homeschooling and sleep duration as well as health during the pandemic-related school closures in Swiss high school students. The control sample ($N = 5308$) completed the survey from May to July 2017, and the lockdown sample ($N = 3664$) completed the survey from May to June 2020 during school closures in Switzerland, in both samples median age was 16 years (IQR, 15–17 years). The Munich Chronotype Questionnaire and KIDSCREEN-10 were used to assess sleep-wake patterns and **health-related quality of life (HRQoL)**. Results show that on scheduled days participants from the lockdown sample slept significantly longer than the control sample (median: 9.00 hours [IQR, 8.25 – 9.75 hours] vs. 7.75 hours [IQR, 7.08 – 8.33 hours]). However, sleep problems were significantly more frequent in the lockdown sample than in the control sample, with difficulties falling asleep and problems sleeping through the night more than 4 times in the previous 2 weeks being more prevalent in the lockdown group (falling asleep: 1237 [33.8%] vs. 1645 [30.9%]; problems sleeping: 437 [11.9%] vs. 439 [8.3%]). On free days, sleep behavior was comparable between the two samples. The lockdown sample reported significantly higher HRQoL scores than the control sample (median, 44.48 [IQR, 40.24, 49.76] vs. 42.27 [IQR, 37.42, 48.29]; $R^2_{\beta^*}$, .007; 95% CI [.004, .012]; $p < .001$), with higher values being reported on the items for feeling fit and well, for being full of energy, for having enough time for themselves, as well as for being able to do the things they wanted in their free time. However, participants in the lockdown sample also indicated feeling lonelier and sadder and having less fun with friends. Furthermore, in the lockdown sample a significantly decreased substance use was found compared to the control sample, although only alcohol consumption ($R^2_{\beta^*}$, .014; 95% CI [.008, .022]; $p < .001$) and caffeine consumption ($R^2_{\beta^*}$, .010; 95% CI [.006, .015]; $p < .001$) stayed significant after correction for multiple comparison. Multilevel regression models analyzing associations of health-related characteristics with sleep revealed that on scheduled days, longer sleep period was associated with better HRQoL ($R^2_{\beta^*}$, .027; 95% CI [.020, .034]; $p < .001$) and less caffeine consumption ($R^2_{\beta^*}$, .013; 95% CI [.009, .019]; $p < .001$)

Paizan et al. (2021) conducted a two-wave study to examine, among others, **life satisfaction and academic self-efficacy** trajectories among ethnic minority and majority adolescents. The sample consisted of 226 adolescents aged 11-17 years in Germany: 121 ethnic minority ($M_{age} = 14.04$; $SD = 1.25$) and 105 ethnic majority adolescents ($M_{age} = 14.36$; $SD = 1.25$), pre-pandemic data was collected from June to October 2019 and the second assessment took place from May to July 2020.

The repeated measures ANCOVA on life satisfaction revealed no main effects of time and minority status, indicating that life satisfaction did not generally differ between 2019 and 2020 and between ethnic majority and minority adolescents. However, a significant interaction effect of time and ethnic group status such emerged such that adolescents from the ethnic minority group reported a significantly higher reduction in life satisfaction than the adolescents from the ethnic majority group, $F(1, 223) = 7.14, p = .008, \eta_p^2 = .03$. Independent t-tests revealed that life satisfaction in the two groups did not significantly differ at the assessment before the onset of the pandemic, $t(224) = 0.40, p = .690, d = 0.05$ ($M_{\text{ethnic minority}} = 5.40; SD = 1.30$ vs. $M_{\text{ethnic majority}} = 5.34; SD = 1.04$), however a small statistically significant difference was observed between the two groups in 2020, $t(224) = -2.16, p = .032, d = 0.29$ ($M_{\text{ethnic minority}} = 4.94; SD = 1.44$ vs. $M_{\text{ethnic majority}} = 5.30; SD = 1.04$). These findings suggest that COVID increased the discrepancy in life satisfaction between ethnic majority and minority adolescents.

Bringolf-Isler et al. (2021) measured the difference in the **health-related quality of life** (HRQoL) of primary school children in 2014/15 compared to 2020 in Switzerland. In total, 1'712 Children (aged 5 to 11 years) participated. The baseline assessment of the SOPHYA cohort study (2014/15) comprised 799 children. At the follow-up assessment in 2020, 913 children were newly recruited. The overall scores of the KINDL-R questionnaire (82.4 [81.8; 83.0] vs. 79.6 [79.1; 80.2], $p < .001$), and the emotional well-being scores (85.6 [84.6; 86.6] vs. 83.3 [82.4; 84.2]), were lower during the year of the pandemic (2020), indicating a reduction in children's HRQoL and emotional well-being. The highest decrease between 2014/15 and 2020 in the adjusted models was seen for the youngest age group (85.0 [83.7; 86.2] vs. 81.1 [80.4; 81.8], $p < .001$) and for girls (83.0 [82.1; 83.8] vs. 80.0 [79.1; 80.9] $p < .001$). Children's HRQoL was particularly low during periods with restrictions and at the height of the COVID-19 waves in 2020."

Essler et al. (2021) conducted a study in Germany in 3 to 10 year-old-children with two timepoints (the first at the peak of the lockdown restrictions ($N = 2'921$), the second after restrictions had been majorly loosened ($N = 890$). They used a modified KIDSCREEN and the Strengths and Difficulties Questionnaire (SDQ) to assess changes in **emotional well-being**. Whereas emotional well-being increased ($M = 3.40 [1.17]$ vs. $M = 4.29 [1.12]$, $p < .001$) and child problem behavior decreased ($M = 3.47 [1.85]$ vs. $M = 2.86 [1.63]$, $p < .001$), family-related well-being ($M = 4.21 [1.10]$ vs. $M = 4.04 [0.85]$, $p < .001$) decreased slightly.

In a longitudinal study, Vira and Skoog (2021) assessed changes in Swedish middle class students' **psychosocial well-being** from before to during the COVID-19 pandemic. Data from 849 children in 30 middle schools in western Sweden were collected via self-report surveys between October 2019 and January 2020 (t_1 ; age range: 9 to 11 years, $M_{age} = 10$ years, $SD_{age} = .03$) and one year later between November 2020 and February 2021 (t_2 , age range: 10 to 12 years, $M_{age} = 11$, $SD_{age} = .05$). In Sweden, middle school students attended school as normal throughout the pandemic. Paired t -tests showed that mean-levels significantly decreased in almost all of students' psychosocial factors from t_1 to t_2 , namely hope, self-efficacy, and self-esteem. However, the effect sizes ranged from negligible to small according to Cohen's d standards. The largest decreases in mean-level were found in students' perceived support from teachers ($M_{t1} = 5.32$, $SD_{t1} = .84$, $M_{t2} = 5.04$, $SD_{t2} = .97$; $p < .001$, Cohen's $d = 0.29$), class and school well-being ($M_{t1} = 4.90$, $SD_{t1} = .80$, $M_{t2} = 4.65$, $SD_{t2} = .86$; $M_{t1} = 5.17$, $SD_{t1} = .94$; $M_{t2} = 4.93$, $SD_{t2} = .95$; respectively; Cohen's d both = 0.26; $p < .001$), and students' self-esteem ($M_{t1} = 4.13$, $SD_{t1} = .93$, $M_{t2} = 3.82$, $SD_{t2} = 1.06$; Cohen's $d = 0.27$, $p < .001$). No significant differences in students' emotional problems ($M_{t1} = 1.50$, $SD_{t1} = .45$, $M_{t2} = 1.53$, $SD_{t2} = .46$) and negligible differences in their sense of hope ($M_{t1} = 4.77$, $SD_{t1} = .89$, $M_{t2} = 4.61$, $SD_{t2} = .96$; Cohen's $d = 0.17$, $p < .001$) and self-efficacy ($M_{t1} = 72.62$, $SD_{t1} = 22.95$, $M_{t2} = 69.75$, $SD_{t2} = 23.85$; Cohen's $d = 0.13$, $p < .01$) from before to during the pandemic were found.

Ravens-Sieberer et al. (2021) conducted a nationwide longitudinal population-based study (COPSY) to investigate the impact of COVID-19 on **the quality of life and mental health in children and adolescents** between 7 and 17 years in Germany. In total, 1923 children and adolescents aged 7 to 17 years ($M_{age} = 12.67$ years, $SD_{age} = 3.29$ years) and their parents participated across two waves during the pandemic (May/June 2020 and December 2020/January 2021). The families were recruited through a population-based approach from an online panel using quota sampling, $n = 1'288$ families participated in both waves. To compensate for the drop-outs from wave 1 to 2, new families ($n = 337$) were recruited using an additional quota sampling. The self-report and parent-proxy surveys assessed health-related quality of life (KIDSCREEN-10), mental health problems (SDQ with the subscales emotional problems, conduct problems, hyperactivity, and peer problems), anxiety (SCARED), depressive symptoms (CES-DC, PHQ-2) and psychosomatic complaints (HBSC-SCL). For comparisons with the pre-pandemic period, population-based data from the BELLA study (Behaviour and Wellbeing of Children and Adolescents in Germany) and the international HBSC study (Health Behaviour in School-aged Children) was used. In wave 1, 69.4% of the 11- to 17-year-old children and adolescents reported that the pandemic was a burden; with the corresponding proportion in wave 2 being significantly

higher, the effect size indicated a small effect for this difference between the two waves (82.6%; $p < .001$; $\phi = .15$). Furthermore, the health-related quality of life (HRQoL) and mental health of children and adolescents significantly decreased during the pandemic, with 47.7% of the 11- to 17-year-olds reporting low HRQoL in wave 2 compared to 40.2% in wave 1 and 15.3% pre-pandemic, though the effect between the two waves during the pandemic remained negligible ($p < .001$; $\phi = .08$). Furthermore, there was a significant increase from pre-pandemic to wave 1 ($p < .001$) in mental health problems such as conduct problems, hyperactivity, peer problems and emotional problems (pre-pandemic: 17.6%, wave 1: 30.4%; wave 2: 30.9%), however, the change in mental health problems from wave 1 to wave 2 was not significant ($p = .706$). A proportion of 30.1% had symptoms of generalized anxiety in wave 2 compared to 24.1% in wave 1 and 14.9% pre-pandemic. The difference between pre-pandemic and wave 1 data was significant, the difference between waves 1 and 2 was significant as well, but negligible due to the effect size ($p = .002$; $\phi = .07$). In wave 2, 15.1% reported depressive symptoms (pre-pandemic: 10.0%, wave 1: 11.3%), however, no significant difference in depressive symptoms was found between pre-pandemic and wave 1. The difference between wave 1 and wave 2 data was significant, but negligible ($p = .010$; $\phi = .01$). Children and adolescents also reported psychosomatic complaints such as irritability (pre-pandemic: 39.8%, wave 1: 53.2%, wave 2: 57.2%), headaches (pre-pandemic: 28.3%, wave 1: 40.5%, wave 2: 46.4%), stomachaches (pre-pandemic: 21.3%, wave 1: 30.5%, wave 2: 36.4%), and feeling low (pre-pandemic: 23.0%, wave 1: 33.8%, wave 2: 43.4%). Comparing wave 1 and wave 2, significant differences indicated higher proportions of children being affected by headaches ($p = .007$), stomachaches ($p = .004$) and feeling low ($p < .001$); with the effect sizes being negligible for headaches and stomachaches ($\phi = .06$ for both), and small for feeling low ($\phi = .10$). Mixed model panel regression analyses showed that the time across wave 2 versus wave 1 was associated with statistically significant lower HRQoL ($- 0.77$ or $- 0.09$ SD; 95% CI [$- 1.26$; $- 0.28$]; $p < .05$), stronger emotional problems ($+ 0.18$ or $+ 0.08$ SD; 95% CI [0.09 ; 0.28]; $p < .05$) and peer problems ($+ 0.10$ or $+ 0.05$ SD; 95% CI [0.01 ; 0.18]; $p < .05$), more pronounced symptoms of anxiety ($+ 0.45$ or $+ 0.10$ SD; 95% CI [0.20 ; 0.70]; $p < .05$) and depression symptoms ($+ 0.46$ or $+ 0.12$ SD; 95% CI [0.23 ; 0.70]; $p < .05$), and stronger psychosomatic complaints such as irritability, headaches and sleeping problems (0.10 or $+ 0.16$ SD; 95% CI [0.07 ; 0.14]; $p < .05$).

In a two-wave prospective study, Van der Laan et al. (2021) assessed **gender-specific changes in life satisfaction** after the COVID-19 related lockdown in Dutch adolescents and whether changes were associated with concerns about COVID-19 and lockdown measures. Data on mental well-being before the lockdown were collected between March 2019 and March 2020 ($n = 224$) – in the

context of an ongoing population-based birth cohort study in the Netherlands called WHISTLER – and a follow-up was conducted 5 to 8 weeks after the first introduction of lockdown measures ($n = 158$; $M_{\text{age}} = 15.53$ years, $SD = 1.25$ years). There was a significant decrease in life satisfaction, $F(1, 153) = 13.195$, $p < .001$, $\eta^2_p = .079$, after the introduction of lockdown measures when compared with the pre-pandemic period. Moreover, a significant interaction between gender and time since lockdown on life satisfaction was observed, $F(1, 153) = 6.034$, $p = .015$, $\eta^2_p = .038$, such that boys' life satisfaction at follow-up decreased compared to their life satisfaction assessed before the pandemic, while there was no significant change over time in girls' life satisfaction. The factor "concerned about social consequences of lockdown measures" was significantly associated with a lower life satisfaction (adjusted β : $-.25$, 95% CI $[-.43; -.06]$, $p = .01$). None of the other factors were significantly associated with a lower life satisfaction: "concerns about health" (adjusted β : $-.04$, 95% CI $[-.23; .14]$, $p = .64$), "concerns about financial matters" (adjusted β : $-.02$, 95% CI $[-.23; .19]$, $p = .86$), and "concerns about family relations" (adjusted β : $-.15$, 95% CI $[-.37; .08]$, $p = .21$). Furthermore, participants did not report more internalizing symptoms after the introduction of lockdown measures, $F(1, 151) = 2.152$, $p = .144$, $\eta^2_p = .014$) when compared with baseline assessments. The factors "concerns about health" (adjusted β : 1.93 , 95% CI $[.53; 3.33]$, $p = .01$), "concerns about social consequences of lockdown measures" (adjusted β : 2.39 , 95% CI $[.96; 3.81]$, $p = .001$), and "concerns about family relations" (adjusted β : 2.41 , 95% CI $[.73; 4.08]$, $p = .01$) were found to be associated with more internalizing symptoms. Adolescents reported significantly better psychosomatic health after the introduction of lockdown, $F(1, 152) = 36.544$, $p < .001$, $\eta^2_p = .194$) compared to the pre-pandemic period. No factor was associated with a worse psychosomatic health ("concerns about health" [adjusted β : $-.04$, 95% CI $[-.12; .04]$, $p = .30$], "concerns about social consequences of lockdown" [adjusted β : $-.08$, 95% CI $[-.17; .00]$, $p = .06$], "concerns about financial matters" [adjusted β : $.08$, 95% CI $[-.01; .17]$, $p = .09$], and "concerns about family relations" [adjusted β : $.01$, 95% CI $[-.09; .11]$, $p = .88$).

Pierce et al. (2021) from the UK Household Longitudinal Study (UKHLS) investigated **the trajectory of mental health and well-being** during April to October of the pandemic 2020 and pre-pandemic data taken from 2018 to 2019. In total 18'321 adults in the UK were included in the study, of which 1'474 (11.8%) were young people aged between 16 and 24. During the first wave of the pandemic in May 2020 the mean score of the General Health Questionnaire (GHQ-12) peaked for the whole population at 12.9 but was most pronounced among those aged 16 to 24 years. In June 2020 an improvement was observed, but the pre-pandemic level was not reached anymore. Initially, enjoyment of day-to-day activities showed the strongest impact of the pandemic. Other items

indicating effects of the pandemic were: loss of sleep, feeling under strain, and feeling unhappy and depressed. Five trajectories emerged for mental health in a latent class analysis by using the longitudinal data. For young people aged between 16 and 24, the following five distributions were found in the trajectories: consistently very good ($n = 532$; 7.9%), consistently good ($n = 627$; 13.2%), recovering ($n = 164$; 15.0%), deteriorating ($n = 99$; 16.2%), consistently very poor ($n = 52$; 15.6%). Considered over the entire sample the group with deteriorated mental health were more likely to be women, Asian, younger (aged 16 to 35), without a partner, and with a previous mental illness. Participants in the group with consistently very poor mental health group were more likely than the general population to be of mixed ethnicity, women, seclusion, living in disadvantaged deprived neighborhoods, having no partner, and having previous mental illness. Individuals living in a deprived neighborhood, isolating themselves from others for health reasons, and reporting a prior mental illness were significantly more likely to be affected whose mental health status worsened between April and October 2020. [NOTE: The percentages seems to be weighted and do not match the absolute numbers in the table of the study.]

A population-based study from Iceland (Thorisdottir et al., 2021) assessed **mental wellbeing** with the Short Warwick Edinburgh Mental Wellbeing Scale in a sample of 13- to 18-year-olds. Data was assessed in October or February in 2016 and 2018 (pre-pandemic) and in October 2020 (during the COVID-19 pandemic). A total of 59'701 survey responses were included in the analysis. Results show a worsened mental wellbeing ($\beta = -0.46$, 95% CI [-0.49, -0.42]) in 2020 across all age groups compared to the same-aged peers before the pandemic. These results were significantly worse in female participants compared with male participants ($\beta = 4.16$, 95% CI [4.05, 4.28], and $\beta = -1.13$, 95% CI [-1.23, -1.03], respectively)

Owens et al. (2022) assessed mental health and wellbeing in a sample of UK university students during the COVID-19 pandemic. The prospective longitudinal study with one month between baseline (T1) in December 2020 and follow up assessment (T2) in January 2021, included 389 young people aged 18–25 ($M_{age} = 21.04$ years, $SD = 1.62$) and measured a range of facets of mental wellbeing using the Patient Health Questionnaire (PHQ-8), **Warwick Edinburgh Mental Wellbeing Scale (WEMWBS)**, Jenkins Sleep Scale (JSS), Ruminative Response Scale (RRS) as well as the Perceived Stress Scale (PSS). Results show that, compared to a reference sample for rates of depression (Kroenke et al.'s, 2009) in which 6.2% of 18–24-year-olds met the criteria for probable depression, in the present sample, 55.5% of the participants at T1 and 52.8% of the participants at T2 had probable depression. A two-sample test of proportion indicated that the large

difference between the reference and the present sample was statistically significant ($p < .0001$). However, the decrease in prevalence between T1 and T2 did not reach statistical significance ($p = .54$). The reference sample for rates of poor mental wellbeing derives from previous research reporting levels of approx. 19%. The larger proportion of poor mental wellbeing in the study sample with 40.3% at T1 and 37.2% at T2 was significantly different to the reference sample ($p < .0001$), the reduction from T1 to T2 however, was not statistically significant ($p = .45$). The proportion of participants who reported sleep disturbance was at T1 (30.0%, $p < .0001$) and T2 (21.9%, $p < .0001$) significantly higher than in the reference sample, the reduction from T1 to T2 did also reach statistical significance ($p = .03$). Compared to estimations from previous research (~15%), the proportion of participants reporting high levels of rumination was significantly higher at T1 (36.1%, $p < .0001$) and T2 (29.3%, $p < .0001$), however, the decrease in rumination from T1 to T2 was not statistically significant ($p = .09$). Lastly, the levels of stress were significantly higher than previous estimates (25%) at T1 (76.6%, $p < .0001$) and T2 (84.0%, $p < .0001$), there was also a statistically significant increase in stress from T1 to T2 ($p = .027$). At T1, higher lockdown restrictions were associated with significantly more depression ($B = 2.06$, $SE = 0.61$, $p = .001$), more stress ($B = 0.93$, $SE = 0.28$, $p = .001$) and more rumination ($B = 0.93$, $SE = 0.41$, $p = .023$). There was also a pattern of **less wellbeing** ($B = -2.08$, $SE = 0.45$, $p < .001$) and more sleep disturbance ($B = 1.02$, $SE = 0.53$, $p = .054$) being associated with higher lockdown restrictions. At T2, the negative effect of higher lockdown restrictions persisted prospectively for depression ($B = 2.01$, $SE = 0.70$, $p = .004$), stress ($B = 0.99$, $SE = 0.37$, $p = .007$), and rumination ($B = 1.23$, $SE = 0.48$, $p = .008$), and was also significant for wellbeing ($B = -2.31$, $SE = 0.58$, $p < .0001$) and sleep disturbance ($B = 1.57$, $SE = 0.60$, $p = .009$).

In Denmark 7445 young adults (age range = 18 – 23) participated in a study (Groot et al., 2022) investigating the impact of housing conditions while lockdown (April 2020) on changes in mental health. Unadjusted mean changes in mental well-being scores were highest for those with no access to outdoor spaces. Lower mental well-being and **QoL** and higher levels of **loneliness** were observed in the third week of the lockdown compared to before the lockdown (3 months after 18th birthday), with higher proportions of individuals with scores indicative of possible (19.1% compared to 12.2%) or probable (2.6% compared to 1.3%) depression/anxiety, low QoL (36.6% compared to 15.6%) or being lonely (23.1% compared to 13.8%). A lack of direct access to outdoor spaces was associated with the greatest decreases in mental well-being scores (no access vs. garden: adjusted mean difference (aMD) = - 0.75; 95% CI [- 1.14, - 0.36]). Compared to youth living in rural homes, those in urban or semi-urban homes had greater decreases in mental well-being (aMD = - 0.20;

95% CI [- 0.39, - 0.02] and - 0.13; 95% CI [- 0.32, 0.06]) and greater odds of onset of low mental well-being (aOR = 1.14; 95% CI [0.94, 1.38] and aOR = 1.21 [1.00, 1.48]). Decreases in QoL and onset of low QoL were associated with living in a denser household and living alone. Youth living with a partner reported increased QoL compared to youth living with parents (aMD = 0.40; 95% CI [0.22, 0.58] and, incident loneliness was associated with living alone and living in a denser household (aOR = 2.12; 95% CI [1.59, 2.82] and aOR = 1.30; 95% CI [1.14, 1.48]). Overall, living alone, in denser households without direct access to outdoor spaces may be especially vulnerable to mental health declines.

Koenig et al. (2021) compared **emotional and behavior problems** (Strengths and Difficulties Questionnaire (SDQ)) self-reported **health-related quality of life** (KIDSCREEN (KS10)), **depression** (PHQ-A), **suicide thoughts** (Paykel Suicide Scale (PSS)) and eating disorders (Weight Concerns Scale (WCS); Eating Disorder Examination-Questionnaire (EDE-Q)) in a matched sample of adolescents (12- to -20-olds) using pre-pandemic (November 26th, 2018 to March 13th, 2020) and lockdown data (March 18th, 2020 to August 29th, 2020). This study found no evidence for an increase in emotional and behavioral problems, depression, thoughts of suicide or suicide attempts, eating disorder symptoms, or a decrease in general health-related quality of life, except a decrease in suicide plans (OR_{adj} = 0.31, 95% CI [0.13, 0.75], *p* = .009) and conduct problems (b_{adj} = -0.16, 95% CI [-0.31, -0.00], *p* = .045). Family risk-factors did not moderate these findings. The influence of socioeconomic status on emotional and behavioral problems as well as depression decreased during the lockdown. This result does not support other findings from Germany showing an increase of mental health problems during the lockdown. Small sample size and low prevalence of outcomes may be an explanation.

Essau and de la Torre-Luque (2021) analyzed adolescent psychopathological profiles and explored its role in predicting the outcome of COVID-19. The sample for this study was drawn from the Millennium Cohort Study (MCS). Between January 2018 to March 2019 and in May 2020, a total of 904 participants completed mental health questions (2018-2019) and a COVID-19 survey (2020). The adolescents were at t1 17 years (*M* = 17.18 years) and at t2 19 years (*M* = 19.17 years) old. As mental health outcomes, **well-being** (Warwick-Edinburgh Mental Wellbeing Scale, WEMWBS), distress (K6 Kessler Distress Scale), depression (Patient Health Questionnaire, PHQ-2) and anxiety (Generalised Anxiety Disorder Scale) have been measured. Based on the MCS sweep 7, four psychopathological profiles were identified. 60.17% of sample belonged to the profile which consisted of adolescents with low levels of psychological symptoms. The second profile included

adolescents with the highest risk of showing almost all the psychological symptoms and problematic behaviors (23.01% of sample). 12.03% of sample belonged to the third profile, which comprised adolescents at high risk of substance use and behavioral addictions. Lastly, the fourth profile included adolescents who reported having bad sleep quality and mental health difficulties, and symptoms indicative of poor emotion regulation (4.79% of sample). Adolescents from the second profile reported a rise in mental distress in anxiety symptoms and in depressive symptoms and a reduction in mental well-being. Adolescents from the fourth profile reported a rise in mental distress, in anxiety symptoms and a reduction in mental well-being.

Stress/Distress

In a prospective, observational online study on a representative sample of 1221 German adolescents aged 10 to 17 years and their parents, Paschke et al. (2021) assessed **psychological stress and other psychosocial variables** before the pandemic (baseline: September 13th – September 27th, 2019) and 1 month after the start of lockdown (follow-up: April 20th – April 30th, 2020), using standardized measures like the Perceived Stress (PSS-4) or Difficulties in Emotion Regulation Scale. A total of 731 child-parent dyads were included in the family-based analyses. Before the pandemic, the adolescents showed mean PSS-4 values of 5.53 ($SD = 3.02$), while during the lockdown this value was 6.93 ($SD = 3.14$). A paired t-test indicate a clinically significant increase in psychological stress, $t(823) = 11.44$, $p < .001$, Cohen's d for repeated measures (d_{rm}) = 0.41). Furthermore, 252 adolescents (34.47%, 95% CI [31.03, 37.92]) reported a significant increase in psychological stress from the baseline to the follow-up assessment. These adolescents had significantly lower PSS-4 values at baseline (4.36 vs. 6.81, $t(609.54) = 12.79$, $p < .001$, $d = 0.93$) and significantly higher values during lockdown compared with those adolescents without increased psychological stress (9.15 vs. 6.22, $t(537.48) = 14.46$, $p < .001$, $d = 1.10$), with large effect sizes. A logistic regression revealed that significant risk factors for increased psychological stress included financial worries (adjusted $OR = 2.13$, 95% CI [1.29, 3.51]), increased psychological stress of the corresponding parent (adjusted $OR = 2.33$, 95% CI [1.56, 3.49]), procrastination (adjusted $OR = 2.10$, 95% CI [1.27, 3.48]), limited access to emotion regulation strategies (adjusted $OR = 2.01$, 95% CI [1.21, 3.35]) and staying at home during COVID-19 lockdown (adjusted $OR = 1.65$, 95% CI [1.08, 2.50]). Together, all adolescents and their parents reported increases in stress during the pandemic, with about one third reporting particularly large increases in stress. Contextual and internal stressors as well as insufficient strategies to cope with stress were identified as risk factors.

A study from the UK (Niedzwiedz et al., 2021) found that **psychological distress** increased 1 month into lockdown with the prevalence rising from 19.4% (95% CI [18.7, 20.1]) in 2017–2019 to 30.6% (95% CI [29.1, 32.3]) in April 2020 ($RR = 1.3$, 95% CI [1.2, 1.4]). Groups most adversely affected included women, young adults, people from an Asian background and those who were degree educated.

Symptoms of **depression, anxiety and stress**, and the psychological impact of the lockdown situation in Spanish population were longitudinally analyzed using the Depression Anxiety and Stress Scale (DASS-21) and the Impact of Event Scale (IES) by Planchuelo-Gómez et al. (2020). 4724 participants filled in two surveys between March 28th and April 5th, 2020 (t1) and April 28th, 2020, and May 15th, 2020 (t2). Symptomatic scores of anxieties, depression and stress were exhibited by 37.22%, 46.42% and 49.66% of the second survey respondents, showing a significant increase compared to the first survey (32.45%, 44.11% and 37.01%, respectively). Regarding the intrusion and avoidance scores remained on a high level during both timepoints. Authors discussed that consumption of information about COVID-19 and physical activity seemed to have an important role in the evolution of psychological symptoms.

A study by Gagné et al. (2022) investigated long-term trends in mental health among 16–34-year-olds (age groups 16-24 years and 25-35 years). They used all waves from the British Household Panel study (1991-2008) and the UK household Longitudinal Study (2009 - 2020) and the first five UKHLS Covid-19 waves administered in April, May, June, July, and September 2020. Findings are based on the General Health Questionnaire 12 (GHQ-12), clinically significant cases and severe cases for **mental distress**. In April 2020, the risk of becoming a clinically significant case increased across groups by 55% to 80% compared to the 2018–19 baseline. This increase, however, rapidly diminished over time: in July–September 2020, there was only a higher risk of caseness in men aged 25–34 years (prevalence ratio (PR) = 1.29, 95% CI [1.01, 1.65]) compared to the 2018–19 baseline. Between April and July-September 2020, the risk of distress significantly decreased in all groups by 21% to 46%. Whereas the increases in April were similar across groups, the decreases in July-September were smaller in men aged 25-35 years ($PR = 0.79$, 95% CI [0.65, 0.97]) compared with women aged 16-24 years ($PR = 0.54$, 95% CI [0.45, 0.65]). Comparing 2018-19 with July- September 2020, there were few differences in the risk of caseness across groups, with significant increases in distress only found in men aged 25-34 years ($PR = 1.29$, 95% CI [1.01, 1.65]). In April 2020, the increase in GHQ scores was largely attributable to the increase in endorsements on “(not) able to enjoy your normal day-to-day activities”, “(not) capable of making decisions...”, and “(not) playing a useful part in things”

Stroud and Gutman (2021) assessed changes in the **mental health** of young adults in the UK during the COVID-19 pandemic using data from the nationally representative, longitudinal panel survey of the Understanding Society COVID-19 survey. The following data on current mental health was measured at six time points (April, May, June, July, September, and November 2020) using the 12-item General Health Questionnaire (GHQ-12), the analyzed sample included 880 young adults (aged 18-25 years in wave 1, $M_{age} = 21.80$ years, $SD = 2.28$ years). Growth curve modeling was used to examine the trajectory of mental health from April to November 2020. The significant intercept revealed that the mental health scores were the highest in April, which is indicating poorer mental health. "There was a significant negative linear slope indicating an improvement in mental health during the first three months of the pandemic. There was also a significant positive quadratic slope, indicating a worsening of mental health from September onward." Analyzed by gender, results showed that the mental health of the female participants was the lowest in April 2020, but it gradually improved until September 2020, when it started to decrease again, while male participants had a relatively stable trajectory of mental health between April and November 2020. These results imply that trajectory of mental health is in line with lockdown restrictions in the UK, with them gradually easing over the Spring and Summer months and tightening from September onwards.

A longitudinal study from the United Kingdom (Bailey et al., 2021) examined the impact of the lockdown and ongoing social restrictions on families of 5- to 16-year-old-children ($M = 11.53$, $SD = 2.56$) with intellectual disability (ID). They used data from an ongoing UK study of families of children with ID. Wave 1 was 2.5 years prior to data collection for wave 2 (April 9th to July 2nd, 2020). Data were available from 397 primary parental caregivers of children with ID at wave 2 of the study. Parental caregivers who completed their wave 2 surveys pre-lockdown vs. during/immediately post-lockdown did not differ in their change from wave 1 to 2 in **psychological distress** ($p = .32$), **life satisfaction** ($p = .63$), caregiving impact ($p = .49$), or positive gains ($p = .95$). Also, the results did not differ in externalizing ($p = .27$), or internalizing ($p = .87$) behavior of the child with ID; nor for sibling externalizing ($p = .86$) problems. The study did thus not find any impact of the lockdown as measured by differences in the amount of change between wave 1 and 2 in parental well-being and child/sibling behavior and emotional problems between families who filled in the wave 2 survey either before or during the COVID-19 restrictions.

An Irish study (Ferry et al., 2021) aimed to examine how **reduced working impacted mental health** in the early months of COVID-19. The collected data included pre-pandemic data from

January/February 2020 and data from April 2020. 8'708 individuals/employees between 18 and 65 years were analyzed. 42.2% of the employees reported reduced working in April 2020. Whereas reduced working per se was not associated with **psychological distress** in April 2020 ($OR = 1.06$, 95% CI [0.91, 1.23]), employees self-isolating/sick, permanently laid-off or in caregiving roles were more likely than other employees to be distressed ($OR = 1.67$, 95% CI [1.13, 2.47]; $OR = 4.93$, 95% CI [2.24, 10.87]; $OR = 1.87$, 95% CI [1.28, 2.73], respectively). Compared to January/February 2020, psychological distress in April 2020 was increased from 20.1% to 31.8% and reduced working was associated with greater psychological distress ($OR = 1.30$, 95% CI [1.14, 1.49]). Females and those not living in a couple were also more likely to report psychological distress ($OR = 2.09$, 95% CI [1.82, 2.40] and $OR = 1.70$, 95% CI [1.47, 1.96], respectively). Older age ($OR = 0.44$, 95% CI [0.33, 0.59] for those aged 45 to 54 years) and higher baseline weekly household earnings ($OR = 1.08$, 95% CI [1.01, 1.17] appeared to be protective.

In the UK; Cooper et al. (2021) used data from the Covid-19: Supporting Parents, Adolescents and Children during Epidemics (Co-SPACE) study to explore the association between loneliness, social relationships, and mental health in adolescents. Self-reported data from 894 young people (age 11 to 16) were used. The data was collected at two timepoints, baseline (March 30th, 2020, and June 1st, 2020) and one month later the first follow up. Overall being female, $r(867) = .19$, $p < .001$, and being older, $r(867) = .13$, $p < .001$, and lower income, $r(804) = .08$, $p < .05$, was associated with being lonely. Higher loneliness (UCLA Short Loneliness Scale (ULS-4)) was significantly associated with higher scores on all mental health measures (emotional symptoms, conduct problems, hyperactivity-inattention as measured by the SDQ and **psychological stress** as measured by the Kessler-6 Psychological Distress Scale (K6)). Psychological stress and loneliness were strongly associated, $r(866) = .51$, $p < .001$. The time someone spent talking to other people was not related to mental health or loneliness. But there was a small positive association between "texting others" and conduct problems, $r(874) = .15$, $p < .001$, hyperactivity-inattention, $r(874) = .08$, $p < .05$, and psychological distress, $r(869) = .09$, $p < .05$. However, there was no significant association between "texting others" and loneliness. It was "concluded that while loneliness was associated with greater mental health difficulties at baseline, it did not predict increased mental health difficulties one month later.

Essau and de la Torre-Luque (2021) analyzed adolescent psychopathological profiles and explored its role in predicting the outcome of COVID-19. The sample for this study was drawn from the Millennium Cohort Study (MCS). Between January 2018 to March 2019 and in May 2020, a total of

904 participants completed mental health questions (2018-2019) and a COVID-19 survey (2020). The adolescents were at t1 17 years ($M = 17.18$ years) and at t2 19 years ($M = 19.17$ years) old. As mental health outcomes, well-being (Warwick-Edinburgh Mental Wellbeing Scale, WEMWBS), **distress** (K6 Kessler Distress Scale), depression (Patient Health Questionnaire, PHQ-2) and anxiety (Generalised Anxiety Disorder Scale) have been measured. Based on the MCS sweep 7, four psychopathological profiles were identified. 60.17% of sample belonged to the profile which consisted of adolescents with low levels of psychological symptoms. The second profile included adolescents with the highest risk of showing almost all the psychological symptoms and problematic behaviors (23.01% of sample). 12.03% of sample belonged to the third profile, which comprised adolescents at high risk of substance use and behavioral addictions. Lastly, the fourth profile included adolescents who reported having bad sleep quality and mental health difficulties, and symptoms indicative of poor emotion regulation (4.79% of sample). Adolescents from the second profile reported a rise in mental distress in anxiety symptoms and in depressive symptoms and a reduction in mental well-being. Adolescents from the fourth profile reported a rise in mental distress, in anxiety symptoms and a reduction in mental well-being.

Depression

A longitudinal study in Spain examined the effects of the pandemic and confinement on the mental health of the general population over 18 years. Data was collected from March 21st to June 4th, 2020 at three time points: two weeks after the beginning of the confinement ($N = 3480$), after a month ($N = 1041$) and after two months, when the lockdown was lifted ($N = 569$). The results show that **depressive symptoms** increased significantly throughout the confinement ($Z(T0-T1) = 7.06$, $p < .001$), slightly decreased ($Z(T1-T2) = 1.34$, $p = .372$) and were reduced by the third evaluation ($Z(T0-T2) = 4.02$, $p < .001$). In the regression model for depression in which 42 % of the variance could be explained, younger age was one of the main predictors, amongst spiritual well-being and loneliness. In the case of anxiety, the model explained 31% of the variance of the fixed effects, with spiritual wellbeing, loneliness, younger age and female gender as the main predictors. This result indicates that younger age is a predictor of depressive symptomatology during the pandemic (González-Sanguino et al., 2021).

A population-based study from Iceland (Thorisdottir et al., 2021) assessed **depressive symptoms** during the Covid-19 pandemic with the Symptom Checklist-90 in a sample of 13- to 18-year-olds. Data was assessed in October or February in 2016 and 2018 (pre-pandemic) and in October 2020

(during the COVID-19 pandemic). A total of 59'701 survey responses were included in the analysis. Results show an increase in depressive symptoms ($\beta = 0.57$, 95% CI [0.53, 0.60]) in 2020 across all age groups compared to the same-aged peers before the pandemic. These results were significantly worse in female participants compared with male participants ($\beta = 4.16$, 95% CI [4.05, 4.28], and $\beta = -1.13$, 95% CI [-1.23, -1.03], respectively)

Symptoms of **depression, anxiety and stress**, and the psychological impact of the lockdown situation in Spanish population were longitudinally analyzed using the Depression Anxiety and Stress Scale (DASS-21) and the Impact of Event Scale (IES) by Planchuelo-Gómez et al. (2020). 4724 participants filled in two surveys between March 28th and April 5th, 2020 (t1) and April 28th, 2020, and May 15th, 2020 (t2). Symptomatic scores of anxieties, depression and stress were exhibited by 37.22%, 46.42% and 49.66% of the second survey respondents, showing a significant increase compared to the first survey (32.45%, 44.11% and 37.01%, respectively). Regarding the intrusion and avoidance scores remained on a high level during both timepoints. Authors discussed that consumption of information about COVID-19 and physical activity seemed to have an important role in the evolution of psychological symptoms.

A longitudinal study (Liang et al., 2021) investigated the **changes in adolescents internalizing symptoms** (anxiety and depression) during the pandemic by administering online surveys at three time points (T1 two weeks after home confinement March 2020; T2 five weeks after confinement; T3 end of home confinement May 2020). A total of 1053 Italian parents participated on behalf of their children aged 11-18 years ($M = 14.13$, $SD = 2.25$, 49.1% girls) in at least one of the surveys. Results show that adolescents anxiety symptoms were significantly different between time points, with small effect sizes ($F(2, 564) = 4.906$, $p = .008$, $\eta_p^2 = 0.017$). Anxiety symptoms increased from T1 to T2 ($p = .016$) and decreased from T2 to T3 ($p = .017$). Difference in depression symptoms was statistically significant between time points ($F(2, 564) = 6.106$, $p = .002$, $\eta_p^2 = 0.021$) and increased from T1 to T2 ($p = .002$), but not to T3. 31.9% of adolescents scored above the cut-off point for anxiety and 17.7% scored high for depression. After controlling for sociodemographic variables, parental stress was positively associated with anxiety symptoms ($B = 0.140$, $SE = 0.031$, $p = .000$) and depression symptoms ($B = 0.222$, $SE = 0.039$, $p = .000$) of adolescents at T3. The study indicates an increase in adolescents' internalizing symptoms in long-term home confinement, which are increased by high levels of parentals stress.

Giannopoulou et al. (2020) examined the impact of the lockdown on **anxiety and depression** among 459 senior high school students in Greece. The proportion of all respondents who screened positive for anxiety ($GAD-7 \geq 11$) increased from 28.3% before the pandemic to 49.5% for the time of home confinement ($p < .0001$). The proportion of all respondents who scored above the Patient Health Questionnaire-9 (PHQ-9) cut off 11 or greater indicating positive screen for depression increased from 48.5% before the pandemic to 63.8% for the time of home confinement ($p < .001$). The proportion of respondents who reported having thoughts that they would be better off dead, or of hurting themselves in some way increased from 25.9% before the pandemic to 29.7% during the lockdown period ($p < .05$). More specifically, the proportion of those who reported having these thoughts nearly every day increased from 6% before the pandemic to 11.1% during the lockdown. The comorbidity, defined as positive screen for depression and anxiety, increased from 24% to 45% ($p < .0001$) and for males from 14.8% to 37.8% ($p < .00001$). After taking sex and baseline levels of depression and anxiety one month prior to the lockdown into account, the level of lockdown experienced distress was predictive of depression and anxiety levels in time of home confinement, accounting for about 30% of variance in symptoms severity scores

The study by Evans et al. (2021) used longitudinal data to characterize effects on mental health and behavior in a UK student sample, measuring **sleep quality** and diurnal preference, **depression** and **anxiety symptoms, wellbeing and loneliness**, and **alcohol use**. Self-report data was collected from 254 undergraduates (219 females) at a university at two-time points: autumn 2019 (baseline, prepandemic) and April/May 2020 (under 'lockdown' conditions). Longitudinal analyses showed a significant rise in depression symptoms ($p < .001$) and a reduction in wellbeing ($p < .001$) at lockdown. Over a third of the sample could be classified as clinically depressed at lockdown compared to 15% at baseline. The increase in depression symptoms was highly correlated with worsened sleep quality, $p < .001$.

Naumann et al. (2021) investigated the **change in mental health** of adolescents in Germany during the first wave of the COVID-19 pandemic and the lockdown. The longitudinal data derived from the nationwide randomly selected anchors of the German family panel pairfam, the age group considered in the analyses were born in 2001 and 2003 ($n = 2465$) and surveyed for the first time in 2018/2019, 854 of those adolescents (aged 16 to 19 years) participated also in the COVID-19 supplementary survey from May to July 2020. Depressiveness assessed using the State-Trait Depression Scale and results are weighted. During the first lockdown in 2020, adolescents showed

a significant increase in depressive symptoms: while prior to the lockdown, 10.4% of the adolescents showed clinically relevant depressive symptoms (95% CI [8.4, 12.5]), in spring 2020 the proportion of adolescents with depressive symptoms increased to 25.3% (95% CI [22.4, 28.2]), which is a statistically significant increase of 14.9% (95% CI [11.8; 18.0]). Of those adolescents who had already shown clinically relevant depressive symptoms in 2018/2019 ($n = 89$; 10.4%), almost 60% still had elevated scores on the depressive scale in spring 2020, while in 40% ($n = 36$) of the respondents the score had fallen below the threshold value. Of those adolescents who had no clinically relevant depressive symptoms prior to the pandemic ($n = 765$), 21.3% ($n = 163$) developed clinically relevant symptoms between the two surveys. A logistic regression revealed that young women had a significantly higher risk of developing depressive symptoms than men of the same age ($OR = 2.8$, 95% CI [1.7, 4.3], $p < .01$). Immigrant background was also a strong risk factor ($OR = 1.8$, 95% CI [1.06, 3.02], $p < .05$).

The Swiss Corona Stress Study provided insights the distress of adolescents and young adults (Quervain et al., 2021). The last survey of the Swiss Corona Stress Study in November 2020 has shown that the proportion of respondents with moderately severe to **severe depressive symptoms** (PHQ-9) was 18%, with the youngest group of 14- to 24-year-olds being the most affected at 29%. Between March 8th and 24th, 2021, an additional anonymous survey was conducted in the German speaking part of Northwestern Switzerland among 393 high school students with the majority being between 16 and 19 years old. 27% of the respondents reported moderately severe to severe depressive symptoms. The most significant stressor associated with depressive symptoms was perceived school pressure. 46% of the respondents indicated they were very or extremely stressed because of the pressure of school. Furthermore, the perception that school pressure has increased due to the pandemic (missed material due to closures, quarantine) was strongly correlated with depressive symptoms. Other factors included worries about poorer education or job opportunities and worries about damage to the social network. An additional factor analysis confirmed that stressors related to school build up the factor with the strongest correlation with depressive symptoms (with a large effect size).

A longitudinal UK study in 7 to 11-year-old school children analyzed proxy and child-reported data from before (2018/2019) and during the lockdown (April to June 2020). A significant increase in **depression** symptoms during the UK lockdown was observed, as measured by the Revised Child Anxiety and Depression Scale (RCADS) short form. CIs suggest a medium-to-large effect size (CI [(95% CI 0.46, 1.01)]. In addition, regression models yielded non-significant changes in the Strength

and Difficulties Questionnaire (SDQ) with respect to emotional problems ($B = -0.25$, 95% CI [-0.54, 0.05]) and the anxiety scores ($B = -0.06$, 95% CI [-0.34, 0.23]) during lockdown compared with before. In contrast, standardized RCADS depression scores were on average 0.74 (95% CI [0.46, 1.01]) higher during lockdown than before. Controlling for demographic factors separately (age, gender and SES) did not strongly alter the effect estimates (Bignardi et al., 2021).

Ertanir et al. (2021) investigated the changes in **Swiss adolescents' mental health**. The mean age was 12.67 ($SD = 0.68$; $N = 377$). The slopes (**depression, anxiety**, home stress, school stress) show whether the mean-level scores increased or decreased from the first timepoint (pre-pandemic score, Sept/Oct 2019) to the second timepoint (Aug/Sept 2020). On average, only the adolescent's depression (slope = 0.117, $p = .004$) and home stress (slope = 0.164, $p = .005$) scores showed a significant increase. There were no significant changes in the adolescent's anxiety ($p = .841$) and school stress ($p = .007$) levels. The inclusion of student's characteristics revealed that the mean-level changes in depression and home stress scores were no more significant. This means that the increase in students' depression and home stress levels were affected by students' characteristics. students' gender predicted the mean score of depression, anxiety, and home stress levels, indicating that, on average, boys had lower depression, anxiety, and home stress scores than girls. girls had a significantly higher increase in depression and anxiety scores than boys. No significant effect of gender was visible for the changes in home stress, nor for changes in the stress of school student's immigrant status predicted the mean scores of depression symptoms and home stress, but not the mean scores of anxieties and school stress an immigrant status was associated with lower home stress and higher depression scores. Immigrant status had no effects on the intra-individual changes of the scores. age, students with access to a private room at home had significantly lower depression and anxiety scores compared to students who did not have access to a private room at home. Students who reported burdens other than COVID-19 had, on average, significantly higher anxiety, and depression scores (intercepts) compared to students who reported COVID-19 as a burdening factor. Moreover, students who were burdened by other factors also had significantly higher mean-level changes (slopes) in depression symptoms. These results indicate that, except for school stress, reporting a COVID-19 burden was not a significant predictor of general changes in student' mental health. On the contrary, other types of burdens seemed to have more impact on the adolescent's mental health status.

Knowles et al. (2022) examined the impacts of the COVID-19 pandemic and related social restrictions and school closures on adolescent mental health, particularly among disadvantaged,

marginalized, and vulnerable groups in two socially and ethnically diverse boroughs in London, UK. They analyzed four waves of data: 3 pre-pandemic (2016-2019) and 1 mid-pandemic (May-August 2020; $N = 1074$; age range: 12–18 years) from the REACH study (Resilience, Ethnicity, and AdolesCent Mental Health). No evidence of an overall increase in the (weighted) prevalence of mental distress mid-pandemic (15.9%, 95% CI [13.0, 19.4]) compared with pre-pandemic (ranging from 17.1% to 18.3%) was found. This same pattern was observed for **depression**, anxiety, and self-harm. However, there were differences in changes in distress across the subgroups: A modest variation by gender, with a small increase in distress among the female participants (B [unstandardized beta coefficient] = 0.42, 95% CI [-0.19, 1.03]), mainly in internalizing scores, and a small reduction among male participants ($B = -0.59$; 95% CI [-1.25, 0.18]; p (interaction) = .007), primarily in externalizing scores was found. Analyses of variation in within-person change pre-COVID to mid-COVID revealed a strong evidence of variation by prior mental health problems (i.e., SDQ scores ≥ 18), with a modest decrease in overall distress among those with prior mental health problems ($B = -1.04$ [-1.88, 0.20]; p (interaction) = .002) and some evidence for variation by household affluence, with a small decrease in distress among young people from less affluent households pre-pandemic ($B = -1.12$ [-1.89, -0.36]; p (interaction) = .016). Further, there was evidence of an increase in distress among those who reported household financial problems ($B = 1.27$; 95% CI [-0.04, 2.58]), but no change among those who did not ($B = -0.36$ 95% CI [-0.96, 0.24]; p (interaction) = .008).

The cohort-study from Burdzovic and Brunborg (2021) examined aspects of self-reported mental and physical health among adolescents (grade 10-11, 16-18 years old) from the longitudinal MyLife study in Norway before (October to December 2018 and 2019) and during the pandemic (October to December 2020), including the role of pandemic-associated anxiety. The COVID-19 cohort consists of students entering high school in 2020, students entering high school in 2019 and 2018 were combined into the single pre-COVID-19 cohort. **Depression** Symptoms were assessed with the 9-item Patient Health Questionnaire (PHQ-9) and the pandemic-associated anxiety with the Pandemic **Anxiety** Scale. A total of 2975 adolescents were included in the analysis (1621 adolescences assessed before and 915 during the pandemic). The COVID-19 cohort was subdivided in the HPA (high pandemic anxiety) or LPA (low pandemic anxiety) group. Results revealed no significant differences in depression symptoms. However, sub-analyses comparing adolescents with high anxiety during the COVID-19 pandemic with adolescents in the pre-pandemic cohort, showed that clinical-level depression symptoms ($aOR = 2.17$; 95% CI [1.39, 3.30]; $p = .001$)

were significantly more common in the HPA group from the COVID-19 cohort than in the Pre-COVID-19 cohort.

Owens et al. (2022) assessed mental health and wellbeing in a sample of UK university students during the COVID-19 pandemic. The prospective longitudinal study with one month between baseline (T1) in December 2020 and follow up assessment (T2) in January 2021, included 389 young people aged 18–25 ($M_{age} = 21.04$ years, $SD = 1.62$) and measured a range of facets of mental wellbeing using the **Patient Health Questionnaire (PHQ-8)**, Warwick Edinburgh Mental Wellbeing Scale (WEMWBS), Jenkins Sleep Scale (JSS), Ruminative Response Scale (RRS) as well as the Perceived Stress Scale (PSS).

Results show that, compared to a reference sample for rates of **depression** (Kroenke et al.'s, 2009) in which 6.2% of 18–24-year-olds met the criteria for probable depression, in the present sample, 55.5% of the participants at T1 and 52.8% of the participants at T2 had probable depression. A two-sample test of proportion indicated that the large difference between the reference and the present sample was statistically significant ($p < .0001$). However, the decrease in prevalence between T1 and T2 did not reach statistical significance ($p = .54$). The reference sample for rates of poor mental wellbeing derives from previous research reporting levels of approx. 19%. The larger proportion of poor mental wellbeing in the study sample with 40.3% at T1 and 37.2% at T2 was significantly different to the reference sample ($p < .0001$), the reduction from T1 to T2 however, was not statistically significant ($p = .45$). The proportion of participants who reported sleep disturbance was at T1 (30.0%, $p < .0001$) and T2 (21.9%, $p < .0001$) significantly higher than in the reference sample, the reduction from T1 to T2 did also reach statistical significance ($p = .03$). Compared to estimations from previous research (~15%), the proportion of participants reporting high levels of rumination was significantly higher at T1 (36.1%, $p < .0001$) and T2 (29.3%, $p < .0001$), however, the decrease in rumination from T1 to T2 was not statistically significant ($p = .09$). Lastly, the levels of stress were significantly higher than previous estimates (25%) at T1 (76.6%, $p < .0001$) and T2 (84.0%, $p < .0001$), there was also a statistically significant increase in stress from T1 to T2 ($p = .027$). At T1, higher lockdown restrictions were associated with significantly more depression ($B = 2.06$, $SE = 0.61$, $p = .001$), more stress ($B = 0.93$, $SE = 0.28$, $p = .001$) and more rumination ($B = 0.93$, $SE = 0.41$, $p = .023$). There was also a pattern of less wellbeing ($B = -2.08$, $SE = 0.45$, $p < .001$) and more sleep disturbance ($B = 1.02$, $SE = 0.53$, $p = .054$) being associated with higher lockdown restrictions. At T2, the negative effect of higher lockdown restrictions persisted prospectively for depression ($B = 2.01$, $SE = 0.70$, $p = .004$), stress ($B = 0.99$, $SE = 0.37$, $p = .007$),

and rumination ($B = 1.23$, $SE = 0.48$, $p = .008$), and was also significant for wellbeing ($B = -2.31$, $SE = 0.58$, $p < .0001$) and sleep disturbance ($B = 1.57$, $SE = 0.60$, $p = .009$).

In Denmark 7445 young adults (age range = 18 – 23) participated in a study (Groot et al., 2022) investigating the impact of housing conditions while lockdown (April 2020) on changes in mental health. Unadjusted mean changes in mental well-being scores were highest for those with no access to outdoor spaces. Lower **mental well-being** and QoL and higher levels of loneliness were observed in the third week of the lockdown compared to before the lockdown (3 months after 18th birthday), with higher proportions of individuals with scores indicative of possible (19.1% compared to 12.2%) or probable (2.6% compared to 1.3%) depression/anxiety, low QoL (36.6% compared to 15.6%) or being lonely (23.1% compared to 13.8%). A lack of direct access to outdoor spaces was associated with the greatest decreases in mental well-being scores (no access vs. garden: adjusted mean difference (aMD) = - 0.75; 95% CI [- 1.14, - 0.36]). Compared to youth living in rural homes, those in urban or semi-urban homes had greater decreases in mental well-being (aMD = - 0.20; 95% CI [- 0.39, - 0.02] and - 0.13; 95% CI [- 0.32, 0.06]) and greater odds of onset of low mental well-being (aOR = 1.14; 95% CI [0.94, 1.38] and aOR = 1.21 [1.00, 1.48]). Decreases in QoL and onset of low QoL were associated with living in a denser household and living alone. Youth living with a partner reported increased QoL compared to youth living with parents (aMD = 0.40; 95% CI [0.22, 0.58] and, incident loneliness was associated with living alone and living in a denser household (aOR = 2.12; 95% CI [1.59, 2.82] and aOR = 1.30; 95% CI [1.14, 1.48]). Overall, living alone, in denser households without direct access to outdoor spaces may be especially vulnerable to mental health declines.

A German study by Alt et al. (2021) hypothesized a **detrimental effect of extraversion** during lockdown conditions **on adolescents' depressiveness** (State-Trait Depression Scale, STDS). Inspecting change, higher extraversion at t_1 predicted a greater increase in negative mood ($b = .14$, $p = .003$, $r = .19$, 95% CI [0.11, 0.29]), more anhedonia ($b = .15$, $p = .002$, $r = .20$, 95% CI [0.11, 0.32]), and a higher increase of **loneliness** ($b = .15$, $p < .001$, $r = .20$, 95% CI [0.13, 0.29]). A higher rise in loneliness predicted a stronger increase of both negative mood ($b = .44$, $p < .001$, $r = .49$, 95% CI [0.39, 0.54]) and anhedonia ($b = .38$, $p < .001$, $r = .43$, 95% CI [0.37, 0.54]). Inspecting pre-pandemic associations at t_1 , extraversion was negatively correlated with anhedonia ($r = .39$, $p < .001$, 95% CI [0.45, 0.33]) and negative mood ($r = .26$, $p < .001$, 95% CI [0.31, 0.19]). Females showed a higher increase in negative mood ($b = .09$, $p = .005$, $r = .14$, 95% CI [0.07, 0.20]) and anhedonia ($b = .08$, $p = .024$, $r = .13$, 95% CI [0.06, 0.20]). Change in loneliness was not predicted

by gender ($b = .05$, $p = .143$, $r = .10$, 95% CI [0.06, 0.17]). At T1, being female was correlated with higher extraversion ($r = .13$, $p = .002$, 95% CI [0.06, 0.19]), more negative mood ($r = .25$, $p < .001$, 95% CI [0.18, 0.31]) and more anhedonia ($r = .09$, $p = .022$, 95% CI [0.02, 0.15]).

This Dutch study from Koelen et al. (2021) measured mental health changes in at-risk university students ($N = 685$, $M_{age} = 22.5$, $SD = 5.5$; range 17-67). **Depression, Generalized Anxiety Disorder, Insomnia, alcohol use, loneliness, happiness, stress and subjective health** was measured at two timepoints (T1 = January 2019 and T2 = April 16th – May 13th, 2020) "Overall, mental complaints increased from T1 to T2. At T2, 55.3% scored above threshold for likely clinical depression, compared to 48.7% at T1 ($X^2 [1, n = 671] = 209.60$; $p < .001$). Roughly 3% more participants experienced clinically significant generalized anxiety during COVID ($X^2 [9, n = 683] = 296.37$; $p < .001$). At T2, 2.1% of the participants experienced clinically severe insomnia compared to none at T1 ($X^2 [6, n = 680] = 263.16$; $p < .001$). Roughly 5% more people experienced social anxiety at T2 compared to T1 ($X^2 [1, n = 679] = 272.95$; $p < .001$). Loneliness increased with 7% ($X^2 [9, n = 679] = 394.45$; $p < .001$). Interestingly, social avoidance and alcohol use decreased (social avoidance: $X^2 [1, n = 683] = 181.67$; $p < .001$; alcohol use, men: $X^2 [1, n = 207] = 32.56$; $p < .001$; alcohol use, women: $X^2 [1, n = 504] = 140.61$; $p < .001$)." (Koelen et al. 2021, p. 4).

Koenig et al. (2021) compared **emotional and behavior problems** (Strengths and Difficulties Questionnaire (SDQ)) self-reported **health-related quality of life** (KIDSCREEN (KS10)), **depression** (PHQ-A), **suicide thoughts** (Paykel Suicide Scale (PSS)) and eating disorders (Weight Concerns Scale (WCS); Eating Disorder Examination-Questionnaire (EDE-Q)) in a matched sample of adolescents (12- to -20-olds) using pre-pandemic (November 26th, 2018 to March 13th, 2020) and lockdown data (March 18th, 2020 to August 29th, 2020). This study found no evidence for an increase in emotional and behavioral problems, depression, thoughts of suicide or suicide attempts, eating disorder symptoms, or a decrease in general health-related quality of life, except a decrease in suicide plans ($OR_{adj} = 0.31$, 95% CI [0.13, 0.75], $p = .009$) and conduct problems ($b_{adj} = -0.16$, 95% CI [-0.31, -0.00], $p = .045$). Family risk-factors did not moderate these findings. The influence of socioeconomic status on emotional and behavioral problems as well as depression decreased during the lockdown. This result does not support other findings from Germany showing an increase of mental health problems during the lockdown. Small sample size and low prevalence of outcomes may be an explanation.

In a longitudinal study, Bouter et al. (2022) investigated the effect of the pandemic on adolescents' mental health in the Netherlands in a prospective cohort of 1022 adolescents (with a 2.5:1 ratio oversampling of adolescents on their emotional and behavioral problems). As part of the iBerry (Investigating Behavioral and Emotional Risk in Rotterdam Youth) Study, **depressive**, anxiety, stress, and oppositional defiant problems as well as psychotic experiences and suicidality were assessed before the pandemic, using several subscales of the Youth Self-Report (YSR) from the Achenbach System of Empirically Based Assessment (ASEBA) (M_{age} at baseline = 15.0 years). 445 and 333 of these 1022 participants completed an online questionnaire during the first lockdown in April 2020 (M_{age} at first lockdown assessment = 17.7 years, $SD = 0.67$), and during the second lockdown in January 2021, respectively. Between the baseline and first lockdown assessment, an increase in depressive problems was observed ($B: 0.93$, 95% CI [0.43, 1.42]). However, there was a decrease in anxiety problems ($B: -0.58$, 95% CI [-0.94, -0.21]) and psychotic experiences ($B = -0.147$, 95% CI [-0.23, -0.07]), whereas stress problems ($B = 0.05$, 95% CI [-0.48, 0.59]), oppositional defiant problems ($B = 0.30$, 95% CI [-0.18, 0.24]), and suicidality ($B = -0.05$, 95% CI [-0.13, 0.03]) did not change. Between the first and second lockdown assessment there was an increase in depressive problems ($B = 2.20$, 95% CI [1.71, 2.70]) and stress problems ($B = 0.96$, 95% CI [0.43, 1.50]). In contrast, psychotic experiences ($B = -0.13$, 95% CI [-0.21, -0.05]) decreased, and anxiety problems ($B = -0.03$, 95% CI [-0.40, 0.34]), oppositional defiant problems ($B = -0.13$, 95% CI [-0.34, 0.08]), and suicidality ($B = 0.03$, 95% CI [-0.04, 0.11]) remained unchanged. Further analysis showed that participants who scored in the clinical range at baseline had the largest decrease in problem scores between baseline and first lockdown for anxiety problems (Cohen's $d = .22$), depressive problems ($d = .12$), oppositional defiant problems ($d = .12$), stress problems ($d = .19$), psychotic symptoms ($d = .15$), and suicidality ($d = .11$). The scores for these participants increased slightly between first and second lockdown assessment, with small effect sizes (Cohen's d ranging from .01 to .11). Participants who scored in the borderline range at baseline showed a similar pattern (although all effect sizes being small, with Cohen's d ranging from .00 to .07). Participants who scored in the normal range at baseline had an increase in scores between baseline and first lockdown assessment and again between first and second lockdown assessment, but all effect sizes were negligible (Cohen's d ranging from .00 to .04). Thus, majority of the participating adolescents reported having emotional and behavioral symptoms that were within the normal range. Among adolescents with high clinical severity prior to the pandemic, the mean symptom scores for all six outcomes decreased significantly.

Essau and de la Torre-Luque (2021) analyzed adolescent psychopathological profiles and explored its role in predicting the outcome of COVID-19. The sample for this study was drawn from the Millennium Cohort Study (MCS). Between January 2018 to March 2019 and in May 2020, a total of 904 participants completed mental health questions (2018-2019) and a COVID-19 survey (2020). The adolescents were at t1 17 years ($M = 17.18$ years) and at t2 19 years ($M = 19.17$ years) old. As mental health outcomes, well-being (Warwick-Edinburgh Mental Wellbeing Scale, WEMWBS), distress (K6 Kessler Distress Scale), **depression** (Patient Health Questionnaire, PHQ-2) and anxiety (Generalised Anxiety Disorder Scale) have been measured. Based on the MCS sweep 7, four psychopathological profiles were identified. 60.17% of sample belonged to the profile which consisted of adolescents with low levels of psychological symptoms. The second profile included adolescents with the highest risk of showing almost all the psychological symptoms and problematic behaviors (23.01% of sample). 12.03% of sample belonged to the third profile, which comprised adolescents at high risk of substance use and behavioral addictions. Lastly, the fourth profile included adolescents who reported having bad sleep quality and mental health difficulties, and symptoms indicative of poor emotion regulation (4.79% of sample). Adolescents from the second profile reported a rise in mental distress in anxiety symptoms and in depressive symptoms and a reduction in mental well-being. Adolescents from the fourth profile reported a rise in mental distress, in anxiety symptoms and a reduction in mental well-being.

Loneliness

A study by Hu and Gutman (2021) in the UK investigated the **trajectory of loneliness in young adults** (aged 18 to 25 years) from June to November 2020 and its association with emotional support as well as demographic and health factors. The analytic sample included 419 young adults (296 females; 123 males). "The final growth curve model, with coefficient estimates of the intercept and slopes accounting for the self-reported loneliness trajectory from June to November 2020. On average, those aged 18 to 25 experienced a decrease in self-reported loneliness from June through July and then an increase from September to November 2020. The positive quadratic trend for time was highly significant, indicating a U-shape trajectory of self-reported loneliness over time. Several covariates revealed significant main effects at the intercept only. Being employed, being in school, as well as having a higher annual household income were all associated with lower levels of self-reported loneliness. Pre-existing physical and mental health conditions were associated with higher levels of self-reported loneliness. A significant interaction between gender and self-reported emotional support was found at the intercept only. Males who reported receiving a higher level of

emotional support also reported lower levels of loneliness compared to males who reported receiving a lower level of emotional support. Females, however, reported similar levels of loneliness regardless of the amount of emotional support they reported.

A study from the UK (Niedzwiedz et al., 2021) found that **loneliness** remained stable overall ($RR = 0.9$, 95% CI [0.6, 1.5]) but repeated cross-sectional analyses revealed that there were differences by age group, with younger people experiencing higher overall levels of loneliness, as well as a large increase in loneliness, from 13.3% (95% CI [11.6, 15.3]) to 20.2% (95% CI [16.0, 25.2]) during lockdown.

In Denmark 7445 young adults (age range = 18 – 23) participated in a study (Groot et al., 2022) investigating the impact of housing conditions while lockdown (April 2020) on changes in mental health. Unadjusted mean changes in mental well-being scores were highest for those with no access to outdoor spaces. Lower mental well-being and QoL and higher levels of **loneliness** were observed in the third week of the lockdown compared to before the lockdown (3 months after 18th birthday), with higher proportions of individuals with scores indicative of possible (19.1% compared to 12.2%) or probable (2.6% compared to 1.3%) depression/anxiety, low QoL (36.6% compared to 15.6%) or being lonely (23.1% compared to 13.8%). A lack of direct access to outdoor spaces was associated with the greatest decreases in mental well-being scores (no access vs. garden: adjusted mean difference (aMD) = - 0.75; 95% CI [- 1.14, - 0.36]). Compared to youth living in rural homes, those in urban or semi-urban homes had greater decreases in mental well-being (aMD = - 0.20; 95% CI [- 0.39, - 0.02] and - 0.13; 95% CI [- 0.32, 0.06]) and greater odds of onset of low mental well-being (aOR = 1.14; 95% CI [0.94, 1.38] and aOR = 1.21 [1.00, 1.48]). Decreases in QoL and onset of low QoL were associated with living in a denser household and living alone. Youth living with a partner reported increased QoL compared to youth living with parents (aMD = 0.40; 95% CI [0.22, 0.58] and, incident loneliness was associated with living alone and living in a denser household (aOR = 2.12; 95% CI [1.59, 2.82] and aOR = 1.30; 95% CI [1.14, 1.48]). Overall, living alone, in denser households without direct access to outdoor spaces may be especially vulnerable to mental health declines.

In the UK; Cooper et al. (2021) used data from the Covid-19: Supporting Parents, Adolescents and Children during Epidemics (Co-SPACE) study to explore the association between **loneliness**, social relationships, and mental health in adolescents. Self-reported data from 894 young people (age 11 to 16) were used. The data was collected at two timepoints, baseline (March 30th, 2020,

and June 1st, 2020) and one month later the first follow up. Overall being female, $r(867) = .19, p < .001$, and being older, $r(867) = .13, p < .001$, and lower income, $r(804) = .08, p < .05$, was associated with being lonely. Higher **loneliness** (UCLA Short Loneliness Scale (ULS-4)) was significantly associated with higher scores on all mental health measures (emotional symptoms, conduct problems, hyperactivity-inattention as measured by the SDQ and psychological stress as measured by the Kessler-6 Psychological Distress Scale (K6)). Psychological stress and loneliness were strongly associated, $r(866) = .51, p < .001$. The time someone spent talking to other people was not related to mental health or loneliness. But there was a small positive association between “texting others” and conduct problems, $r(874) = .15, p < .001$, hyperactivity-inattention, $r(874) = .08, p < .05$, and psychological distress, $r(869) = .09, p < .05$. However, there was no significant association between “texting others” and loneliness. It was “concluded that while loneliness was associated with greater mental health difficulties at baseline, it did not predict increased mental health difficulties one month later.

Anxiety

A longitudinal study (Liang et al., 2021) investigated the **changes in adolescents internalizing symptoms** (anxiety and depression) during the pandemic by administering online surveys at three time points (T1 two weeks after start of home confinement March 2020; T2 five weeks after start of confinement; T3 end of home confinement May 2020). A total of 1053 Italian parents participated on behalf of their children aged 11-18 years ($M = 14.13, SD = 2.25, 49.1\%$ girls) in at least one of the surveys. Results show that adolescents anxiety symptoms were significantly different between time points, with small effect sizes, $F(2, 564) = 4.906, p = .008, \eta_p^2 = 0.017$. Anxiety symptoms increased from T1 to T2 ($p = .016$) and decreased from T2 to T3 ($p = .017$). Difference in depression symptoms was statistically significant between time points, $F(2, 564) = 6.106, p = .002, \eta_p^2 = 0.021$ and increased from T1 to T2 ($p = .002$), but not to T3. 31.9% of adolescents scored above the cut-off point for anxiety and 17.7% scored high for depression. After controlling for sociodemographic variables, parental stress was positively associated with anxiety symptoms ($B = 0.140, SE = 0.031, p = .000$) and depression symptoms ($B = 0.222, SE = 0.039, p = .000$) of adolescents at T3. The study indicates an increase in adolescents' internalizing symptoms in long-term home confinement, which are increased by high levels of parents stress.

Symptoms of **depression, anxiety and stress**, and the psychological impact of the lockdown situation in Spanish population were longitudinally analyzed using the Depression Anxiety and

Stress Scale (DASS-21) and the Impact of Event Scale (IES) by Planchuelo-Gómez et al. (2020). 4724 participants filled in two surveys between March 28th and April 5th, 2020 (t1) and April 28th, 2020, and May 15th, 2020 (t2). Symptomatic scores of anxieties, depression and stress were exhibited by 37.22%, 46.42% and 49.66% of the second survey respondents, showing a significant increase compared to the first survey (32.45%, 44.11% and 37.01%, respectively). Regarding the intrusion and avoidance scores remained on a high level during both timepoints. Authors discussed that consumption of information about COVID-19 and physical activity seemed to have an important role in the evolution of psychological symptoms.

Giannopoulou et al. (2020) examined the impact of the lockdown on **anxiety and depression** among 459 senior high school students in Greece. The proportion of all respondents who screened positive for anxiety (GAD-7 ≥ 11) increased from 28.3% before the pandemic to 49.5% for the time of home confinement ($p < .0001$). The proportion of all respondents who scored above the Patient Health Questionnaire-9 (PHQ-9) cut off 11 or greater indicating positive screen for depression increased from 48.5% before the pandemic to 63.8% for the time of home confinement ($p < .001$). The proportion of respondents who reported having thoughts that they would be better off dead, or of hurting themselves in some way increased from 25.9% before the pandemic to 29.7% during the lockdown period ($p < .05$). More specifically, the proportion of those who reported having these thoughts nearly every day increased from 6% before the pandemic to 11.1% during the lockdown. The comorbidity, defined as positive screen for depression and anxiety, increased from 24% to 45% ($p < .0001$) and for males from 14.8% to 37.8% ($p < .00001$). After taking sex and baseline levels of depression and anxiety one month prior to the lockdown into account, the level of lockdown experienced distress was predictive of depression and anxiety levels in time of home confinement, accounting for about 30% of variance in symptoms severity scores

Giménez-Dasí et al. (2021) conducted an assessment on the effect of **anxiety** levels of children ($N = 215$, 6 – 11 years old) using the SENA scales developed for evaluation of Spanish children and adolescents. The age groups were divided into two groups: younger (6 – 7 years of age) and older (8 – 11 years old), in accordance with SENA scales. Preliminary analyses did not indicate differences in anxiety among the age groups, either in T1 or T2 (all the p values > 0.20). In T3, a univariate test revealed significant differences between the younger and older children ($F(2, 65) = 1.64$, $p = .04$, $\eta^2 = 0.8$) with a mean size effect. The differences according to gender were also significant. At T1, the comparisons show statistically significant differences between girls and boys only in the 6-year-old group with a mean size effect ($M_{\text{Boy}} = 2.32$, $SD = 0.62$; $M_{\text{Girl}} = 2.62$, $SD =$

0.61), $F(1.72) = 4.47$, $p = .04$, $d = 0.48$). No significant gender differences were found for older children at either time (all the p -values $> .14$). To compare the average mean scores of children of 6 years of age in T1 and T3, they executed a repeated measures ANCOVA with gender as a co-variable. On introducing this co-variable, the differences were not significant ($F(1, 66) = 0.10$, $p = .75$). For the group of older children (without gender differences), they compared T1 and T3 using a student's t -test of repeated measures (with an alpha = 0.01 to avoid type I Errors). The results indicated that the reduction in T3 was statistically significant ($M_{T1} = 2.31$, $SD = 0.68$; $M_{T3} = 2.15$, $SD = 0.69$; $t(128) = 2.62$, $p = .01$), but with a small effect size ($d = 0.24$).

The study by Amendola et al. (2021) investigated the level of generalized **anxiety** (GAD-7) in university students in Switzerland (ZHAW) ($M = 26.67$ years, $SD = 5.83$). Participants were recruited via their university e-mail. Repetitive participation was possible. $N = 676$ participated in both T0 (baseline, April 3rd – 14th) and T1 surveys (April 30th – May 14th 2020). Prevalence of moderate-to-severe anxiety were 20.2% and 15.6% at T0 and T1, respectively. Baseline anxiety was considered higher compared to other pre-pandemic studies. Anxiety decreased from lockdown to post-lockdown. The following positively predicted anxiety: older age, female gender, non-Swiss nationality, loneliness, participants' concern about their own health, and interaction between time and participants' concern about their own health. Resilience and social support negatively predicted anxiety.

Elmer et al. (2020) compared data from university students collected April 2020 and September 2019, as well as with previous students' data from 2016 and 2017. They investigated change in mental health using the German version of the Center for Epidemiologic Studies Depression scale (CES-D), the Generalized Anxiety Disorder scale (GAD-7), Perceived Stress Scale (PSS), and the UCLA Loneliness Scale. The analyses within the same students (2020 vs. Sept. 2019) showed significant that students became more depressed ($M_{diff} = 4.44$, $SE = 0.50$, $p < .001$), slightly more anxious ($M_{diff} = 0.60$, $SE = 0.24$, $p = .014$), more stressed ($M_{diff} = 2.67$, $SE = 0.40$, $p < .001$), and more lonely ($M_{diff} = 0.13$, $SE = 0.02$, $p < .001$). Similar negative trends were also observed for comparisons with data collected one year earlier in April 2019, with exception of anxiety. The within-person comparisons indicate that students on average report lower levels of mental health during the COVID-19 crisis than before the crisis. COVID-19 specific worries were related to increased depression or stress, isolation in social networks and less interaction with others with increased anxiety, while isolation of friendship-networks related to increased loneliness, as did living alone.

More emotional support was protective for depression, as was the number of friends for loneliness. Female sex was associated with negative mental health trajectories for all outcomes.

Ertanir et al. (2021) investigated the changes in **Swiss adolescents' mental health**. The mean age was 12.67 ($SD = 0.68$; $N = 377$). The slopes (**depression, anxiety, home stress, school stress**) show whether the mean-level scores increased or decreased from the first timepoint (pre-pandemic score, Sept/Oct 2019) to the second timepoint (Aug/Sept 2020). On average, only the adolescent's depression (slope = 0.117, $p = .004$) and home stress (slope = 0.164, $p = .005$) scores showed a significant increase. There were no significant changes in the adolescent's anxiety ($p = .841$) and school stress ($p = .007$) levels. The inclusion of student's characteristics revealed that the mean-level changes in depression and home stress scores were no more significant. This means that the increase in students' depression and home stress levels were affected by students' characteristics. students' gender predicted the mean score of depression, anxiety, and home stress levels, indicating that, on average, boys had lower depression, anxiety, and home stress scores than girls. girls had a significantly higher increase in depression and anxiety scores than boys. No significant effect of gender was visible for the changes in home stress, nor for changes in the stress of school student's immigrant status predicted the mean scores of depression symptoms and home stress, but not the mean scores of anxieties and school stress an immigrant status was associated with lower home stress and higher depression scores. Immigrant status had no effects on the intra-individual changes of the scores. age, students with access to a private room at home had significantly lower depression and anxiety scores compared to students who did not have access to a private room at home. Students who reported burdens other than COVID-19 had, on average, significantly higher anxiety, and depression scores (intercepts) compared to students who reported COVID-19 as a burdening factor. Moreover, students who were burdened by other factors also had significantly higher mean-level changes (slopes) in depression symptoms. These results indicate that, except for school stress, reporting a COVID-19 burden was not a significant predictor of general changes in student' mental health. On the contrary, other types of burdens seemed to have more impact on the adolescent's mental health status.

In a longitudinal study, Bouter et al. (2022) investigated the effect of the pandemic on adolescents' mental health in the Netherlands in a prospective cohort of 1022 adolescents (with a 2.5:1 ratio oversampling of adolescents on their emotional and behavioral problems). As part of the iBerry (Investigating Behavioral and Emotional Risk in Rotterdam Youth) Study, depressive, **anxiety**, stress, and oppositional defiant problems as well as psychotic experiences and suicidality were

assessed before the pandemic, using several subscales of the Youth Self-Report (YSR) from the Achenbach System of Empirically Based Assessment (ASEBA) ($M_{\text{age at baseline}} = 15.0$ years). 445 and 333 of these 1022 participants completed an online questionnaire during the first lockdown in April 2020 ($M_{\text{age at first lockdown assessment}} = 17.7$ years, $SD = 0.67$), and during the second lockdown in January 2021, respectively. Between the baseline and first lockdown assessment, an increase in depressive problems was observed ($B = 0.93$, 95% CI [0.43, 1.42]). However, there was a decrease in anxiety problems ($B = -0.58$, 95% CI [-0.94, -0.21]) and psychotic experiences ($B = -0.147$, 95% CI [-0.23, -0.07]), whereas stress problems ($B = 0.05$, 95% CI [-0.48, 0.59]), oppositional defiant problems ($B = 0.30$, 95% CI [-0.18, 0.24]), and suicidality ($B = -0.05$, 95% CI [-0.13, 0.03]) did not change. Between the first and second lockdown assessment there was an increase in depressive problems ($B = 2.20$, 95% CI [1.71, 2.70]) and stress problems ($B = 0.96$, 95% CI [0.43, 1.50]). In contrast, psychotic experiences ($B = -0.13$, 95% CI [-0.21, -0.05]) decreased, and anxiety problems ($B = -0.03$, 95% CI [-0.40, 0.34]), oppositional defiant problems ($B = -0.13$, 95% CI [-0.34, 0.08]), and suicidality ($B = 0.03$, 95% CI [-0.04, 0.11]) remained unchanged. Further analysis showed that participants who scored in the clinical range at baseline had the largest decrease in problem scores between baseline and first lockdown for anxiety problems (Cohen's $d = .22$), depressive problems ($d = .12$), oppositional defiant problems ($d = .12$), stress problems ($d = .19$), psychotic symptoms ($d = .15$), and suicidality ($d = .11$). The scores for these participants increased slightly between first and second lockdown assessment, with small effect sizes (Cohen's d ranging from .01 to .11). Participants who scored in the borderline range at baseline showed a similar pattern (although all effect sizes being small, with Cohen's d ranging from .00 to .07). Participants who scored in the normal range at baseline had an increase in scores between baseline and first lockdown assessment and again between first and second lockdown assessment, but all effect sizes were negligible (Cohen's d ranging from .00 to .04). Thus, majority of the participating adolescents reported having emotional and behavioral symptoms that were within the normal range. Among adolescents with high clinical severity prior to the pandemic, the mean symptom scores for all six outcomes decreased significantly.

Knowles et al. (2022) examined the impacts of the COVID-19 pandemic and related social restrictions and school closures on adolescent mental health, particularly among disadvantaged, marginalized, and vulnerable groups in two socially and ethnically diverse boroughs in London, UK. They analyzed four waves of data: 3 pre-pandemic (2016-2019) and 1 mid-pandemic (May-August 2020; $N = 1074$; age range: 12–18 years) from the REACH study (Resilience, Ethnicity, and AdolesCent Mental Health). No evidence of an overall increase in the (weighted) prevalence of

mental distress mid-pandemic (15.9%, 95% CI [13.0, 19.4]) compared with pre-pandemic (ranging from 17.1% to 18.3%) was found. This same pattern was observed for **depression, anxiety, and self-harm**. However, there were differences in changes in distress across the subgroups: A modest variation by gender, with a small increase in distress among the female participants (B [unstandardized beta coefficient] = 0.42, 95% CI [-0.19, 1.03]), mainly in internalizing scores, and a small reduction among male participants (B = -0.59; 95% CI [-1.25, 0.18]; p (interaction) = .007), primarily in externalizing scores was found. Analyses of variation in within-person change pre-COVID to mid-COVID revealed a strong evidence of variation by prior mental health problems (i.e., SDQ scores ≥ 18), with a modest decrease in overall distress among those with prior mental health problems (B = -1.04 [-1.88, 0.20]; p (interaction) = .002) and some evidence for variation by household affluence, with a small decrease in distress among young people from less affluent households pre-pandemic (B = -1.12 [-1.89, -0.36]; p (interaction) = .016). Further, there was evidence of an increase in distress among those who reported household financial problems (B = 1.27; 95% CI [-0.04, 2.58]), but no change among those who did not (B = -0.36 95% CI [-0.96, 0.24]; p (interaction) = .008).

The cohort-study from Burdzovic Andreas & Brunborg (2021) examined aspects of self-reported mental and physical health among adolescents (grade 11) from the longitudinal MyLife study in Norway before and during the pandemic, including the role of pandemic-associated anxiety. The COVID-19 cohort consists of students entering high school in 2020, students entering high school in 2019 and 2018 were combined into the single pre-COVID-19 cohort. **Depression** Symptoms were assessed with the 9-item Patient Health Questionnaire (PHQ-9) and the pandemic-associated anxiety with the Pandemic **Anxiety** Scale. A total of 2975 adolescents were included in the analysis (1621 adolescences assessed before and 915 during the pandemic). The COVID-19 cohort was subdivided in the HPA (high pandemic anxiety) or LPA (low pandemic anxiety) group. Results revealed no significant differences in depression symptoms. However, sub-analyses comparing adolescents with high anxiety during the COVID-19 pandemic with adolescents in the pre-pandemic cohort, showed that clinical-level depression symptoms (aOR = 2.17; 95% CI [1.39, 3.30]; p = .001) were significantly more common in the HPA group from the COVID-19 cohort than in the Pre-COVID-19 cohort.

O'Connor (2021) investigated the trajectory of **mental health and well-being** during the first 6 weeks of lockdown in 3077 adults in the UK. **Suicidal ideation** increased over time, with respondents at wave 2 (9.2%; OR = 1.17, 95% CI [1.01, 1.34], p = .031) and wave 3 (9.8%; OR =

1.24, 95% CI [1.07, 1.44], $p = .005$) reporting higher levels than at wave 1 (8.2%). The difference between waves 2 and 3 was not statistically significant. 21% of the participants was above the cut-off point for moderate or severe levels of **symptoms of anxiety** at wave 1. However, these symptoms decreased across waves, with wave 2 (18.6%; $OR = 0.89$, 95% CI [0.81, 0.97], $p = .012$) and wave 3 (16.8%; $OR = 0.82$, 95% CI [0.74, 0.90], $p < .0001$) being lower than wave 1 (21%). Again, sig. between wave 2 and 3 not. sign. subgroup analyses showed that women, young people (18–29 years), those from more socially disadvantaged backgrounds and those with pre-existing mental health problems have worse mental health outcomes during the pandemic across most factors.

A longitudinal study in Italy, Spain, and Portugal (Orgilés et al., 2021) investigated the psychological reactions to the pandemic two, five, and eight weeks after the lockdown in 2020. Parents completed the "Impact Scale of COVID-19 and Home Confinement on Children and Adolescents". Country differences were found, but overall **anxiety** ($OR = 3.78$; 95% CI [2.90, 4.91]; $p \leq .001$), mood symptoms ($OR = 1.95$; 95% CI [1.61, 2.35]; $p = .005$), sleep disturbances ($OR = 1.49$; 95% CI [1.30, 1.70]; $p \leq .001$) and behavioral disturbances ($OR = 1.17$; 95% CI [1.08, 1.27]; $p \leq .001$) and cognitive disturbances ($OR = 1.45$; 95% CI [1.21, 1.73]; $p \leq .001$) significantly increased from two weeks after the lockdown (Time 1) to five weeks (Time 2). From five to eight weeks (Time 3), almost all psychological reactions decreased except for anxiety. Parental stress was related to all children's psychological symptoms, except for eating disturbances

This Dutch study from Koelen et al. (2021) measured mental health changes in at-risk university students ($N = 685$, $M_{age} = 22.5$, $SD = 5.5$; range 17-67). **Depression, Generalized Anxiety Disorder, Insomnia, alcohol use, loneliness, happiness, stress and subjective health** was measured at two timepoints (T1 = January 2019 and T2 = April 16th – May 13th, 2020) "Overall, mental complaints increased from T1 to T2. At T2, 55.3% scored above threshold for likely clinical depression, compared to 48.7% at T1 ($X^2 [1, n = 671] = 209.60$; $p < .001$). Roughly 3% more participants experienced clinically significant generalized anxiety during COVID ($X^2 [9, n = 683] = 296.37$; $p < .001$). At T2, 2.1% of the participants experienced clinically severe insomnia compared to none at T1 ($X^2 [6, n = 680] = 263.16$; $p < .001$). Roughly 5% more people experienced social anxiety at T2 compared to T1 ($X^2 [1, n = 679] = 272.95$; $p < .001$). Loneliness increased with 7% ($X^2 [9, n = 679] = 394.45$; $p < .001$). Interestingly, social avoidance and alcohol use decreased (social avoidance: $X^2 [1, n = 683] = 181.67$; $p < .001$; alcohol use, men: $X^2 [1, n = 207] = 32.56$; $p < .001$; alcohol use, women: $X^2 [1, n = 504] = 140.61$; $p < .001$)." (Koelen et al. 2021, p. 4)

Essau and de la Torre-Luque (2021) analyzed adolescent psychopathological profiles and explored its role in predicting the outcome of COVID-19. The sample for this study was drawn from the Millennium Cohort Study (MCS). Between January 2018 to March 2019 and in May 2020, a total of 904 participants completed mental health questions (2018-2019) and a COVID-19 survey (2020). The adolescents were at t1 17 years ($M = 17.18$ years) and at t2 19 years ($M = 19.17$ years) old. As mental health outcomes, well-being (Warwick-Edinburgh Mental Wellbeing Scale, WEMWBS), distress (K6 Kessler Distress Scale), **depression** (Patient Health Questionnaire, PHQ-2) and anxiety (Generalised Anxiety Disorder Scale) have been measured. Based on the MCS sweep 7, four psychopathological profiles were identified. 60.17% of sample belonged to the profile which consisted of adolescents with low levels of psychological symptoms. The second profile included adolescents with the highest risk of showing almost all the psychological symptoms and problematic behaviors (23.01% of sample). 12.03% of sample belonged to the third profile, which comprised adolescents at high risk of substance use and behavioral addictions. Lastly, the fourth profile included adolescents who reported having bad sleep quality and mental health difficulties, and symptoms indicative of poor emotion regulation (4.79% of sample). Adolescents from the second profile reported a rise in mental distress in anxiety symptoms and in depressive symptoms and a reduction in mental well-being. Adolescents from the fourth profile reported a rise in mental distress, in anxiety symptoms and a reduction in mental well-being.

Behavioral/emotional (affective) disorders

Caviezel Schmitz and Krüger (2020) conducted a study in Switzerland to analyze the effects of the Pandemic on children and adolescents (Age range: 2-17 years) on their **emotional and physical changes**. Parents answered an online survey for their children ($N = 245$; $M_{\text{age}} = 7$ years old). Outcomes were measured at two different time points with two different groups (April 20th to May 10th, 2020 [lockdown] and May 11th to June 7th, 2020 [lifting of restrictions]). The results of the Strengths and Difficulties Questionnaire (SDQ) indicate that 40% of the children experienced **some sort of difficulties**. At both time points, 40% of the 4-8 year-old and 50% of the 9-14 years-old children and adolescents had at least light difficulties. 50% of the 15 year-old adolescents had difficulties during the first wave, this increased to 70% at the second time point. Together, most of the Children worried little. Children older than 9 years worrying more often than younger ones and especially older children and adolescents did not look positive in to the future during June 2020 (lifting of restriction).

A longitudinal study from the Netherlands (Achterberg et al., 2021) examined **externalizing behavior** and whether perceived stress mediated the lockdown effects on children. A total of 106 parents and 151 children (aged 10- 13 years) filled in questionnaires during lockdown and data were combined with data of previous years. Children's externalizing behavior (measured by the Strength and Difficulties Questionnaires (SDQ)) during the lockdown was significantly predicted by prior externalizing behavior ($p < .001$). However, longitudinal child measures showed a gradual decrease in internalizing and externalizing behavior, which seemed decelerated by the COVID-19 lockdown. Overall, relatively few parents (19%) and children (21%) reported stress in the last two weeks of lockdown. Stress measured with the Perceived Stress Scale (measured on a 0–4 scale) ranged between 0 and 2.4 in parents and between 0 and 2.8 in children. Perceived stress of children and parents were not significantly correlated ($p = .209$). However, changes in parental negative feelings and children's externalizing behavior were mediated by perceived stress: higher scores prior to the lockdown were related to more stress during the lockdown, which in turn was associated with an increase in parental negative feelings and children's' externalizing behavior. Perceived stress in parents and children was associated with negative coping strategies. Additionally, children's stress levels were influenced by prior and current parental over reactivity

Lehmann et al. (2022) found an increased Strengths and Difficulties Questionnaire (SDQ) total scale mean scores ($t_1 = 11.1$; $t_2 = 11.7$; $p < .001$) from t_1 (27th of April – 12th of May 2020) to t_2 (16th of December 2020 – 10th of January 2021) in Norwegian children (age range: 12 – 19). The highest increase was observed for internalizing problems ($t_1 = 5.6$, $t_2 = 6.2$; $p < .001$), emotional symptoms ($t_1 = 3.4$, $t_2 = 3.9$; $p < .001$), and peer problems ($t_1 = 2.2$, $t_2 = 2.3$; $p = .002$). No statistical difference was observed for externalizing subscales or prosocial behavior.

Hu and Qian (2021) examined the mental health impact of the COVID-19 pandemic on adolescents (10- to 16-year-olds) in the United Kingdom in July 2020. The study is part of a longitudinal study. Regression models showed an overall increase in **emotional problems** ($B = .23$; 95% CI [.09, .38]; $p = .002$) and **peer relationship problems** ($B = .27$; 95% CI [.15, .40]; $p < .000$) and a decrease in **conduct problems** ($B = -.18$, 95% CI [-.30, -.07]; $p = .002$). Adolescents with better-than-median mental health before the pandemic have experienced an increase in their emotional problems ($B = 1.05$; 95% CI [.88, 1.22]; $p < .001$), conduct problems ($B = .28$; 95% CI [.16, .39]; $p < .001$), hyperactivity ($B = .64$; 95% CI [.46, .82]; $p < .001$), and peer relationship problems ($B = .94$; 95% CI [.79, 1.08]; $p < .001$), and they have also become less prosocial ($B = -.89$; 95% CI [-1.03, -.75]; $p < .001$). In contrast, adolescents with worse-than-median mental health before the pandemic have

experienced opposite changes in each Strengths and Difficulties Questionnaire domain. Boys have experienced a smaller increase in emotional problems but a greater decrease in prosocial tendency. The negative mental health impact is particularly prominent among adolescents in one-parent, one-child, and low-income households. Adult household members' COVID-19 symptoms and illness have undermined adolescents' peer relationships.

A Spanish study by Ezpeleta et al. (2020) investigates the life conditions of adolescents during lockdown and the association with **psychological problems** (SDQ). 226 parents (117 girls/109 boys, $M_{age} = 13.9$, $SD = 0.28$) answered an online survey about their children. After the lockdown, the following problems increased significantly: **conduct problems** ($p = .006$, small effect size), **peer problems** ($p < .001$, moderate effect size), **prosocial behavior problems** ($p < .001$, large effect size) and **total difficulties** ($p = .005$, small effect size). There was no significant change in hyperactivity-inattention problems after the lockdown. Higher emotional problems were associated with sleep problems, feelings of frustration, a low quality of the adolescent's relationships (lack of online communication with friends, worsened family relationships), adolescents' activities (not keeping up daily routines, (parents overburdened with helping with homework, not doing joint activities with the family, boredom, excessive screen time), and with behaviors of the adults (parents giving up enforcing the rules and more discussions/stress than usual in the family at home) as well as their own concern about contagion. Higher conduct problems scores were mainly associated with adolescents' relationships, how the adults in the household behaved, and the adolescents' activities. Higher hyperactivity-inattention problems scores and peer problems were mostly associated with the adolescents' activities. Higher prosocial problems scores were mostly associated with the behavior of the adults. Higher total problems scores were associated with the adolescents' activities, followed by the adolescents' relationships, the adults' behavior, and last changes in weight (4.3%). Effect sizes ranged from small (0.04) to large (0.36).

A study by Raw et al. (2021) that is part of the longitudinal Co-SPACE study in the UK focused on mental health effects during the lockdown. Parents and caregivers from 4 to 16-year-olds filled in a Strengths and Difficulties Questionnaire (SDQ) at baseline and at least one follow-up questionnaire. Growth curve analyses showed an increase between April and July 2020 in **hyperactivity/inattention**, while **conduct problems** and **emotional symptoms** remained relatively stable. Although many children maintained stable low symptoms, other children showed elevated symptoms in July. Predictors of such elevated symptoms were parent/carer with higher self-reported mental health symptoms (of depression, anxiety, and stress), having special education

needs or neurodevelopmental disorders, and to be younger in age. Moreover, different types of symptom trajectories were identified

In the UK; Cooper et al. (2021) used data from the Covid-19: Supporting Parents, Adolescents and Children during Epidemics (Co-SPACE) study to explore the association between loneliness, social relationships, and mental health in adolescents. Self-reported data from 894 young people (age 11 to 16) were used. The data was collected at two timepoints, baseline (March 30th, 2020, and June 1st, 2020) and one month later the first follow up. Overall being female, $r(867) = .19, p < .001$, and being older, $r(867) = .13, p < .001$, and lower income, $r(804) = .08, p < .05$, was associated with being lonely. Higher loneliness (UCLA Short Loneliness Scale (ULS-4)) was significantly associated with higher scores on all mental health measures (**emotional symptoms, conduct problems, hyperactivity-inattention** as measured by the SDQ and psychological stress as measured by the Kessler-6 Psychological Distress Scale (K6)). Psychological stress and loneliness were strongly associated, $r(866) = .51, p < .001$. The time someone spent talking to other people was not related to mental health or loneliness. But there was a small positive association between “texting others” and conduct problems, $r(874) = .15, p < .001$, hyperactivity-inattention, $r(874) = .08, p < .05$, and psychological distress, $r(869) = .09, p < .05$. However, there was no significant association between “texting others” and loneliness. It was “concluded that while loneliness was associated with greater mental health difficulties at baseline, it did not predict increased mental health difficulties one month later.

A longitudinal study from the United Kingdom (Bailey et al., 2021) examined the impact of the lockdown and ongoing social restrictions on families of 5- to 16-year-old-children ($M = 11.53, SD = 2.56$) with intellectual disability (ID). They used data from an ongoing UK study of families of children with ID. Wave 1 was assessed in winter 2018, Wave 2 was partly pre-lockdown and partly during/immediately post-lockdown (April 9th to July 2nd, 2020). Overall data were available from 397 primary parental caregivers of children with ID at wave 2 of the study. The results did not differ in **externalizing** ($p = .27$), or **internalizing** ($p = .87$) **behavior** of the child with ID; nor for sibling externalizing ($p = .86$) problems. The study did thus not find any impact of the lockdown on child/sibling behavior and emotional problems.

The objective of the Spanish study by Giménez-Dasí et al. (2020) was to investigate the **psychological effects** that the confinement measures have had on **the externalizing and internalizing behavior of a sample of children aged 3–11 years** from Madrid. A total of 167

families with children participated. The parents evaluated the children through the System of Evaluation of Children and Adolescents (SENA) scale in the months of February and April. The results show significant changes over time in most of the indicators evaluated in the older children of the sample (6–11-year-old) with increases in attention problems ($p = .02$), emotional regulation problems ($p = .01$), and hyperactivity and impulsivity ($p < .001$). There were no significant changes over time on the same indicators in the younger children of the sample (3-6-year-olds; $p = .19$). However, in their overall ratings, more than two-thirds of parents of primary school children and more than half of the parents with preschool children reported that the psychological state of their child has worsened.

A longitudinal study in Italy, Spain, and Portugal (Orgilés et al., 2021) investigated the psychological reactions to the pandemic two, five, and eight weeks after the lockdown in 3 to 18 year-old children. Parents completed the “Impact Scale of COVID-19 and Home Confinement on Children and Adolescents”. Country differences were found, but overall anxiety ($OR = 3.78$; 95% CI [2.90, 4.91]; $p \leq .001$), **mood symptoms** ($OR = 1.95$; 95% CI [1.61, 2.35], $p = .005$), sleep disturbances ($OR = 1.49$; 95% CI [1.30, 1.70]; $p \leq .001$) and **behavioral disturbances** ($OR = 1.17$; 95% CI [1.08, 1.27]; $p \leq .001$) and **cognitive disturbances** ($OR = 1.45$; 95% CI [1.21, 1.73]; $p \leq .001$) significantly increased from two weeks after the lockdown (Time 1) to five weeks (Time 2). From five to eight weeks (Time 3), almost all psychological reactions decreased except for anxiety. Parental stress was related to all children’s psychological symptoms, except for eating disturbances

A longitudinal study in the Netherlands (Green et al., 2021) investigated **mood fluctuation** during the pandemic in adolescents (10- to 20-year-olds) and young adults (21 to 25 years) that were recruited via high schools and college. Relative to older adolescents, the results of the Profile of Mood States Scale (POMS) indicated that younger adolescents report higher levels of vigor and lower levels of tension and depression in both May 2020 and November 2020. From May to November 2020 feelings of vigor decreased ($p = .021$), while feelings of tension ($p < .001$) and depression ($p = .006$) increased, particularly among younger adolescents. Furthermore, the analyzes yielded evidence for a link between vulnerability factors (i.e., family stress and inequality of opportunity in online homeschooling) and instability in negative affect (i.e., tension and depression fluctuations) during the first months of the pandemic. These findings demonstrates that during the COVID-19 pandemic, young people’s vulnerability with respect to their mood and emotional reactivity increased, particularly for adolescents who experienced more stressors.

A longitudinal study from Italy (Alivernini et al., 2021) assessed **positive and negative affect in 14 to 19 year-olds**, using the Positive and Negative Affect Scale for children (PANAS-C) as a standardized instrument. Affects was measured one year before the COVID-19 pandemic as well as at the end of the lockdown in May and June 2020. The results indicated a reduction of levels of positive affect and increases in the levels of negative affect (both $p < .001$)

Romeo et al. (2021) investigated the impact of the **use of a surgical mask on the affective behaviour in 40 infants** aged 2–9 months (study group) from April 2020 to December 2020 in Italy by using the Face, Legs, Activity Cry and Consolability Scale (FLACC) which is assessing pain and distress among pediatric patients. They compared the data to 40 infants with the same ages and characteristics assessed before the onset of the COVID-19 pandemic in 2019 (control group). The infants assessed during the pandemic had significantly higher scores ($p < .001$) in the FLACC scale than those assessed before the COVID-19 onset (infants aged 2-5 months: study group: 3 (0-10) vs. control group: 0.2 (0-1); infants aged 6-9 months: 6.7 (2-10) vs. 1.2 (0-5)). 37 out the 40 infants from the study group showed some signs of discomfort and appeared irritable and less prone to be engaged by the health operator wearing a mask, with a different pattern of responses depending on age of the infants. In the study group, in 19 out of 22 infants aged 2-5 months, an initial difficulty in obtaining full visual attention was observed, with frequent gaze aversion reactions and initial irritability. All 18 infants assessed between 6-9 months showed an increased irritability and often inconsolable crying and in some cases expressions of fear to consolation attempts. In 14 infants (78%) parental intervention was needed and in more than half of the cases (56%) the assessment had to be postponed. In the control group from 2019, irritability was reported in no-one of the infants assessed between 2-5 months and in 2 infants assessed between 6-9 months. Thus, surgical mask wearing health operators significantly increased distress in infants up to 9 months.

An exploratory study from Italy (Cerniglia et al., 2021) examined the influence of the pandemic on the **quality of mother-child exchanges during feeding** in a sample of mothers and children ($N = 359$), along **with children's' emotional behavior**. The Child Behavior Checklist (CBL-1,5-5) was administered at 18 (T1; May 2019) and 36 months (T2; November 2020) to assess mothers' perceptions of the children's emotional behavior. Results show that children's emotional/behavioral functioning was rated by mothers as more maladaptive at T2, especially in the subscales of Withdrawn ($\eta^2 = .69, p < .001$), Anxious/Depressed ($\eta^2 = .75, p < .001$) and Aggressive Behaviour ($\eta^2 = .65, p < .001$). Children also showed significantly higher scores in the Internalizing ($\eta^2 = .62, p < .001$) and Externalizing ($\eta^2 = .71, p < .001$) subscales from T1 to T2. The study results indicate

that the quality of mother-child interactions decreased significantly from the pre-pandemic period to the current period and that children's scores become more maladaptive during the pandemic.

Conti et al. (2020) conducted an observational longitudinal study at the Fondazione Stella Maris (FSM) in Italy to investigate lockdown-related **emotional and behavioral changes** in the pediatric neuropsychiatric population. 141 families with children aged 1.5-18 years filled in two online questionnaires. For the population aged 1.5-5 years, anxiety and somatic problems increased as indicated by differences from pre-lockdown to lockdown in the Syndrome Scale Score in the Somatic Complaints ($p < .10$) and in the DSM-Oriented Anxiety Scale ($p < .05$). Younger age in the 1.5–5 years subpopulation resulted as “protective” factor. For the subgroup aged 6-18 years, obsessive-compulsive, post-traumatic and thought problems increased as indicated by the Child Behavior Check List questionnaire that showed differences in the Syndrome-Scale-Score-Thought problems ($p < .05$) as well as in the Obsessive scale ($p < .05$) and the post-traumatic stress disorder scale ($p < .10$). Increases in psychiatric symptoms were associated with financial hardship experienced by the families during lockdown.

Koenig et al. (2021) compared **emotional and behavior problems** (Strengths and Difficulties Questionnaire (SDQ)) self-reported **health-related quality of life** (KIDSCREEN (KS10)), **depression** (PHQ-A), **suicide thoughts** (Paykel Suicide Scale (PSS)) and eating disorders (Weight Concerns Scale (WCS); Eating Disorder Examination-Questionnaire (EDE-Q)) in a matched sample of adolescents (12- to -20-olds) using pre-pandemic (November 26th, 2018 to March 13th, 2020) and lockdown data (March 18th, 2020 to August 29th, 2020). This study found no evidence for an increase in emotional and behavioral problems, depression, thoughts of suicide or suicide attempts, eating disorder symptoms, or a decrease in general health-related quality of life, except a decrease in suicide plans ($OR_{adj} = 0.31$, 95% CI [0.13, 0.75], $p = .009$) and conduct problems ($b_{adj} = -0.16$, 95% CI [-0.31, -0.00], $p = .045$). Family risk-factors did not moderate these findings. The influence of socioeconomic status on emotional and behavioral problems as well as depression decreased during the lockdown. This result does not support other findings from Germany showing an increase of mental health problems during the lockdown. Small sample size and low prevalence of outcomes may be an explanation.

In a longitudinal study, Bouter et al. (2022) investigated the effect of the pandemic on adolescents' mental health in the Netherlands in a prospective cohort of 1022 adolescents (with a 2.5:1 ratio oversampling of adolescents on their emotional and behavioral problems). As part of the iBerry (Investigating Behavioral and Emotional Risk in Rotterdam Youth) Study, depressive, anxiety,

stress, and **oppositional defiant problems** as well as psychotic experiences and suicidality were assessed before the pandemic, using several subscales of the Youth Self-Report (YSR) from the Achenbach System of Empirically Based Assessment (ASEBA) ($M_{\text{age at baseline}} = 15.0$ years). 445 and 333 of these 1022 participants completed an online questionnaire during the first lockdown in April 2020 ($M_{\text{age at first lockdown assessment}} = 17.7$ years, $SD = 0.67$), and during the second lockdown in January 2021, respectively. Between the baseline and first lockdown assessment, an increase in depressive problems was observed ($B: 0.93$, 95% CI [0.43, 1.42]). However, there was a decrease in anxiety problems ($B: -0.58$, 95% CI [-0.94, -0.21]) and psychotic experiences ($B = -0.147$, 95% CI [-0.23, -0.07]), whereas stress problems ($B = 0.05$, 95% CI [-0.48, 0.59]), oppositional defiant problems ($B = 0.30$, 95% CI [-0.18, 0.24]), and suicidality ($B = -0.05$, 95% CI [-0.13, 0.03]) did not change. Between the first and second lockdown assessment there was an increase in depressive problems ($B = 2.20$, 95% CI [1.71, 2.70]) and stress problems ($B = 0.96$, 95% CI [0.43, 1.50]). In contrast, psychotic experiences ($B = -0.13$, 95% CI [-0.21, -0.05]) decreased, and anxiety problems ($B = -0.03$, 95% CI [-0.40, 0.34]), oppositional defiant problems ($B = -0.13$, 95% CI [-0.34, 0.08]), and suicidality ($B = 0.03$, 95% CI [-0.04, 0.11]) remained unchanged. Further analysis showed that participants who scored in the clinical range at baseline had the largest decrease in problem scores between baseline and first lockdown for anxiety problems (Cohen's $d = .22$), depressive problems ($d = .12$), oppositional defiant problems ($d = .12$), stress problems ($d = .19$), psychotic symptoms ($d = .15$), and suicidality ($d = .11$). The scores for these participants increased slightly between first and second lockdown assessment, with small effect sizes (Cohen's d ranging from .01 to .11). Participants who scored in the borderline range at baseline showed a similar pattern (although all effect sizes being small, with Cohen's d ranging from .00 to .07). Participants who scored in the normal range at baseline had an increase in scores between baseline and first lockdown assessment and again between first and second lockdown assessment, but all effect sizes were negligible (Cohen's d ranging from .00 to .04). Thus, majority of the participating adolescents reported having emotional and behavioral symptoms that were within the normal range. Among adolescents with high clinical severity prior to the pandemic, the mean symptom scores for all six outcomes decreased significantly.

Mutluer et al. (2020) conducted a cross-sectional study in Turkey to investigate how individuals with ASD responded to COVID-19 in terms of comprehension and adherence to implemented measures; changes in their behavioral problems; and how their caregivers' anxiety levels relate with these behavioral changes. 87 individuals with diagnosed ASD – age ranged from 3–29 years – were included according to DSM-5 criteria by child psychiatrists. When asked about the changes in their

child during the pandemic period, 55% of the parents said that their child got more aggressive, 26% said their child's tics increased or new tics emerged, 29% said their child's communication skills deteriorated, and 44% and 33% of the parents reported reduced sleep and appetite changes, respectively. All subscales of Aberrant Behavior Checklist differed significantly between before and after the pandemic conditions, indicating a worsening of the ASD individuals' functioning ($p < .001$, $\eta^2 = 0.26$).

This study from the UK (Morris et al., 2021) investigates the impact of the pandemic, the lockdown and subsequent return to school, on the **social development and communication of autistic children** from their parents' perspective and to examine whether associations exist between social-communicative behaviours and the variables affected by the lockdown or return to school period. Parents from 176 autistic children answered the questionnaire at T1 (after the lockdown when children returned to school) and 54 follow-up questionnaires were returned at T2 after the first half term. During the lockdown, only 10.2% of children regularly attended school, suggesting that the school routine was disrupted for a great majority of children in the sample. The results indicate that self-regulation skills ($p < .05$) and cooperation skills ($p < .05$) were most affected over the course of the lockdown. Logistic regressions showed, that children whose parents felt supported by their schools were reported to show an improvement in their social communication skills (i.e. social-communicative skills got a little bit better, or got a lot better) over the course of the lockdown ($p = .007$) and children who continued to see friends and family outside of school and the household were perceived to also show a slight improvement in their overall social-communicative behaviours in comparison to those who did not ($p = .002$). Children's physical activity levels were perceived to significantly increase during the return to school ($p < .0001$), which was associated with better social-communication outcomes ($p < .05$).

Sergi et al. (2021) considered a sample of 88 children who had been diagnosed with **autism spectrum disorder** (ASD), aged between 18 and 30 months. They all took part in a "principles and procedures of Applied Behavior Analysis"-based (ABA) intervention funded by the Local Health Authority of the province of Caserta in Italy. Authors aimed to evaluate how children's behavior with ASD changed during complete lockdown and during the three months after the resumption of activities. Results show that during the lockdown children experienced significant improvements in **communication** ($F(1,175) = 3999.877$; $p < .05$), **socialization** ($F(1,175) = 34.912$; $p < .05$), and **personal autonomy** ($F(1,175) = 72.268$; $p < .05$).

Siracusano et al. (2021) investigated the impact of lockdown due to COVID-19 pandemic on the **adaptive functioning, problematic and repetitive behaviors** of 85 **Italian preschoolers and schoolers with autism spectrum disorder**. Within the Preschooler group, after the lockdown, a significant improvement emerged in almost all domains of the Adaptive Behavior Assessment System, (General Adaptive Composite, $p = .014$; Conceptual Adaptive Domain, $p = .031$; Practical Adaptive Domain, $p = .047$). Whereas, in the Schooler group, no significant result was found between baseline and T1, in all the adaptive domains investigated. Participants whose parents underwent an online parental support during lockdown had a significant improvement in the Practical Adaptive Domain ($p = .027$) in comparison to the individuals with ASD whose parents did not receive such support. These findings underline the importance of parent care in ASD treatment, pertaining to involvement in the intervention and time spent at home with children

Substance and media use

Levaillant et al. (2021) conducted a historic cohort study to assess the impact of the COVID-19 pandemic and lockdown on the **consumption of anxiolytics, hypnotics, and antidepressants** by extracting and analyzing data from the French health insurance database between January 1st and February 28th, 2021. During the pandemic, a high increase in the number of new consumers of antidepressants, and hypnotics and anxiolytics per week was observed in adolescents aged 12-18 years as compared with the trend from 2015 to 2020. The use of hypnotics and anxiolytics shifted from a slightly decreasing trend to a high increase (from -0.49; 95% CI [-0.65, -0.32] to +18.46; 95% CI [17.08, 19.85] new consumers weekly; $p < .001$, respectively from -0.9; 95% CI [-2.53, 0.73]; $p = .279$, to +35.72; 95% CI [22.28, 49.15]; $p < .001$), while antidepressants, that were already in a slight rising trend, converted into a considerable increase (from +6.03; 95% CI [5.07, 6.99], to +34.48; 95% CI [26.59, 42.38] new consumers weekly; $p < .001$). The same increase in all three drug categories studied was observed among young adults aged 19 to 25 years, with a higher increase trend after March 2020 for anxiolytics (from +1.71; 95% CI [-0.67, 4.1]; $p = .159$, to +55.92; 95% CI [36.31, 75.54] new consumers weekly; $p < .001$) and antidepressants (from +14.98; 95% CI [13.01, 16.95] to +87.12; 95% CI [70.91, 103.33] new consumers weekly; $p < .001$) and a shift from a slight decrease to an increase for hypnotics (from -5.87; 95% CI [-6.45, -5.28] to +15.08; 95% CI [10.27, 19.9] new consumers weekly; $p < .001$). This increase in the use of substances was higher for children, adolescents and young adults compared to the people older than 26.

This Dutch study from Koelen et al. (2021) measured mental health changes in at-risk university students ($N = 685$, $M_{age} = 22.5$, $SD = 5.5$; range 17–67). Depression, Generalized Anxiety Disorder, Insomnia, **alcohol use**, loneliness, happiness, stress and subjective health was measured at two timepoints (T1 = January 2019 and T2 = April 16th – May 13th, 2020) "Overall, mental complaints increased from T1 to T2. At T2, 55.3% scored above threshold for likely clinical depression, compared to 48.7% at T1 ($X^2 [1, n = 671] = 209.60$; $p < .001$). Roughly 3% more participants experienced clinically significant generalized anxiety during COVID ($X^2 [9, n = 683] = 296.37$; $p < .001$). At T2, 2.1% of the participants experienced clinically severe insomnia compared to none at T1 ($X^2 [6, n = 680] = 263.16$; $p < .001$). Roughly 5% more people experienced social anxiety at T2 compared to T1 ($X^2 [1, n = 679] = 272.95$; $p < .001$). Loneliness increased with 7% ($X^2 [9, n = 679] = 394.45$; $p < .001$). Interestingly, social avoidance and **alcohol use** decreased (social avoidance: $X^2 [1, n = 683] = 181.67$; $p < .001$; alcohol use, men: $X^2 [1, n = 207] = 32.56$; $p < .001$; alcohol use, women: $X^2 [1, n = 504] = 140.61$; $p < .001$)." (Koelen et al. 2021, p. 4)

Albrecht et al. (2022) investigated the association between homeschooling and sleep duration as well as health during the pandemic-related school closures in Swiss high school students. The control sample ($N = 5308$) completed the survey from May to July 2017, and the lockdown sample ($N = 3664$) completed the survey from May to June 2020 during school closures in Switzerland, in both samples median age was 16 years (IQR, 15–17 years). The Munich Chronotype Questionnaire and KIDSCREEN-10 were used to assess sleep-wake patterns and health-related quality of life (HRQoL). Results show that on scheduled days participants from the lockdown sample slept significantly longer than the control sample (median: 9.00 hours [IQR, 8.25 – 9.75 hours] vs. 7.75 hours [IQR, 7.08 – 8.33 hours]). However, sleep problems were significantly more frequent in the lockdown sample than in the control sample, with difficulties falling asleep and problems sleeping through the night more than 4 times in the previous 2 weeks being more prevalent in the lockdown group (falling asleep: 1237 [33.8%] vs. 1645 [30.9%]; problems sleeping: 437 [11.9%] vs. 439 [8.3%]). On free days, sleep behavior was comparable between the two samples. The lockdown sample reported significantly higher HRQoL scores than the control sample (median, 44.48 [IQR, 40.24, 49.76] vs. 42.27 [IQR, 37.42, 48.29]; $R^2_{\beta^*}$, .007; 95% CI [.004, .012]; $p < .001$), with higher values being reported on the items for feeling fit and well, for being full of energy, for having enough time for themselves, as well as for being able to do the things they wanted in their free time. However, participants in the lockdown sample also indicated feeling lonelier and sadder and having less fun with friends. Furthermore, in the lockdown sample a significantly decreased **substance use** was found compared to the control sample, although only alcohol consumption ($R^2_{\beta^*}$, .014; 95%

CI [.008, .022]; $p < .001$) and caffeine consumption ($R^2_{\beta^*}$, .010; 95% CI [.006, .015]; $p < .001$) stayed significant after correction for multiple comparison. Multilevel regression models analyzing associations of health-related characteristics with sleep revealed that on scheduled days, longer sleep period was associated with better HRQoL ($R^2_{\beta^*}$, .027; 95% CI [.020, .034]; $p < .001$) and less caffeine consumption ($R^2_{\beta^*}$, .013; 95% CI [.009, .019]; $p < .001$)

With respect to **alcohol abuse** (AUDIT-C), a study from the UK (Niedzwiedz et al., 2021) observed that in 18- to 24-year-olds binge drinking remained unchanged but that the proportion of those who are drinking four or more times per week increased. With respect to smoking, they observed that current smoking declined.

In a population-based study from Iceland (Thorisdottir et al., 2021), the frequency of **substance use** in 13- to 18-year-olds was assessed in the years 2016, 2018, and 2020. A total of 59'701 survey responses were included in the analysis. Results show significant decreases in **cigarette smoking** ($OR = 2.61$, 95% CI [2.59, 2.66]) and **alcohol intoxication** ($OR = 2.59$, 95% CI [2.56, 2.64]) among the 15- to 18-year-olds in 2020, as well as a reduction of e-cigarette use ($OR = 2.61$, 95% CI [2.59, 2.64]) among 16- to 18-year-olds compared with 2016 and 2018.

In a longitudinal study conducted by Vasconcelos et al. (2021), the effects of the COVID-19 mitigation measures on **alcohol consumption, and binge drinking** in college students were assessed. A convenience sample of 146 Portuguese college students was recruited at a University in Portugal in October 2019 (age range: 17-26 years, $M_{age} = 19.5$, $SD = 1.5$ years) consisting of regular binge drinkers (regular BDs), infrequent binge drinkers (infrequent BDs) and non-binge drinkers (non-BDs) who were surveyed at three time points: pre-lockdown (Fall 2019), during lockdown (April–May 2020) and 6 months after (post-lockdown: October–November 2020). Results revealed that during lockdown, almost half of the participants (48%) decreased their alcohol use, while 15% had a higher consumption of alcohol, and 37% did not change their alcohol intake. Compared to pre-lockdown, during post-lockdown 57% of participants decreased their alcohol intake, while 9% showed an increased alcohol use, and 34% drank the same. When lockdown and post-lockdown moments were compared, they found that slightly more than half of respondents (51%) kept drinking the same amount, while 28% decreased alcohol intake and 21% increased it. Furthermore, an estimated linear mixed-effects model indicated that all college students decreased their alcohol consumption over the course of the pandemic. Regular BDs decreased alcohol consumption from pre-lockdown ($M = 10.9$) to lockdown ($M = 4.8$, $p < .001$) and to post-lockdown

($M = 2.2$, $p < .001$), not differing significantly between lockdown and post-lockdown ($p = .215$). Infrequent BDs diminished their alcohol consumption in the post-lockdown ($M = 0.8$) compared to the pre-lockdown period ($M = 5.5$, $p = .010$), on the other hand alcohol craving increased from Lockdown to Post-Lockdown ($p = .012$). There was an association between the moment of assessment and stress ($\beta = 3.18$, $p < .001$), depression ($\beta = 2.55$, $p < .001$) and anxiety ($\beta = 2.36$, $p < .001$) with the scores of all those three affective states being higher during post-lockdown compared with lockdown. There was no significant association between stress, depression and anxiety and alcohol consumption.

In a retrospective cohort study, Pigeaud et al. (2021) investigated the association between the lockdown due to COVID-19 and acute alcohol intoxication (AAI) among adolescents in the Netherlands. Between January 1st and December 31st, 2020, 482 adolescents under 18 years (median age: 16 years) were admitted for AAI to one of the 12 participating hospitals. To estimate the effect of the lockdown measures on the admission for AAI, different time periods were compared: pre-lockdown (January 1st - March 15th, 2020), during the first lockdown (March 16th - May 31st, 2020), after the first lockdown (June 1st - October 14th, 2020), and the beginning of the second lockdown (October 15th - December 31st, 2020). As a reference group, the same periods in 2019 were used. A Poisson regression model revealed a decrease in the prevalence of adolescents admitted for AAI by 70% ($p = .002$, 95% CI [.14, .63]) between the pre-lockdown and the first lockdown period. Comparing the first lockdown phase and the period after the first lockdown (reopening phase), the prevalence of adolescents admitted for AAI significantly increased ($p = .047$, 95% CI [1.01, 4.88]), however it did not significantly differ from the same period in 2019 ($p = .758$, 95% CI [.50, 1.66]). There was also no significant difference between the reopening phase and the second lockdown period ($p = .074$, 95% CI [.23, 1.07]).

A longitudinal study from Vera et al. (2021) compared changes in alcohol consumption before and after the COVID-19 outbreak and the impact of sociodemographic and mental health variables on such changes in young adults in Spain. Data were collected through a targeted sampling procedure as part of a larger, ongoing longitudinal study. The sample consisted of 305 young adults from Spain aged between 18 and 26 years ($M_{\text{age}} = 21.27$, $SD = 2.21$), who completed a first questionnaire from November 2019 and February 2020 (T1) and second follow-up questionnaires in March 2021 (T2). Linear mixed-effects models with time as the only fixed predictor to estimate changes in drinking quantity and frequency revealed that there was an average decrease in the quantity of alcohol consumption of 6.44 Standard Drink Units (SDU) between pre- and post-COVID-

19 period and an average decrease in frequency of 3.16 days drinking (during the past two months) between pre- and post-COVID-19 outbreak. Participants with a relatively high depression level at the pre-COVID assessment ($b = -1.10, p = .306$) did not show a decline in drinking frequency, while those with a relatively low ($b = -2.91, p = .014$) or moderate depression level ($b = -2.18, p = .039$) showed significant decreases in drinking frequency. Furthermore, decreases in quantity of alcohol use were less pronounced among those participants with a relatively high level of depression ($b = -4.71, p = .003$) and more pronounced for those with a relatively low ($b = -8.32, p < .001$) or moderate ($b = -7.29, p < .001$) level of depression.

Paschke et al. (2021) investigated screen time and problematic media usage patterns over the course of the pandemic. Therefore they used pre-pandemic data from the forsa.omninent panel (Germany). 1221 children/adolescents provided data for the baseline (September 13th to 17th, 2019) and 67.49% also for the first follow-up (April 20th to 30th, 2020). Most of the adolescents ($N = 862$) showed uncritical gaming behavior (71.48 %; (95 % CI [68.93, 74.02])). 10.03 % adolescents with at-risk Gaming (RG) and 2.74% with Gaming Disorder (GD) boys were affected significantly more often than girls. A proportion of 9.44 % (95 % CI [7.80, 11.09]) adolescents did not use Social Media (SM) or used them only irregularly ($n = 114$). An uncritical SM usage pattern before the pandemic was shown by 79.2 % (95 % CI [76.92, 81.49]; $n = 956$). The criteria of at-risk Social Media Use (RSMU) were fulfilled by 8.2 % ($n = 99$) and of Social Media Disorder (SMD) by 3.15 % ($n = 38$) of the adolescents. A significant gender difference in favor of the boys was found for RSMU but not for SMD. A combined pattern of a problematic use of games and SM was shown for 5.67 % of the adolescents ($n = 68$). The criteria of GD and SMD was fulfilled by 1.33 % of the adolescents ($n = 16$) including a higher proportion of boys. The frequencies of regular and daily gamers and SM users significantly increased from September 2019 to April 2020. Weak to moderate increases in mean screen times on days during the week (i.e., school days) and at weekends (i.e., spare days) were found for both usage of games and SM. A one-factorial ANOVA on the time spent on gaming/SM depending on the three gaming patterns revealed significant effects at both measurement points (gaming: baseline: $F(2, 977) = 31.12, p < .001$; follow-up: $F(2, 607) = 9.91, p < .001$; SM: baseline: $F(2, 1056) = 13.33, p < .001$; follow-up: $F(2, 672) = 5.09, p = .006$). Before the COVID-19 pandemic, screen times of uncritical gamers and SM users were significantly shorter than those of at-risk and pathological users. During the lockdown, screen times of un-critical gamers were significantly shorter than those of at-risk and pathological gamers. Uncritical SM users screen was significantly shorter than those of pathological but not of at-risk users. At-risk users did not significantly differ from pathological users at baseline and first follow-up but showed small to

medium effect sizes. At baseline, the symptom severity of problematic usage behavior was significantly associated with mean screen times: gaming time explained 23.05 % of the variance of symptom severity (standardized $n^2 = 0.48$, 95 % CI [0.43, 0.53], $p < .001$, Nagelkerkes $R^2 = 0.23$) and SM time a smaller but significant proportion of 7.44 % (standardized $n^2 = 0.27$, 95 % CI [0.22, 0.33], $p < .001$, Nagelkerkes $R^2 = 0.07$). The predictive value decreased for the mean screen times assessed under the lockdown to 8.46 % for games (standardized $n^2 = 0.29$, 95 % CI [0.22, 0.36], $p < .001$, Nagelkerkes $R^2 = 0.08$) and to 2.92 % for SM (standardized $n^2 = 0.17$, 95 % CI [0.10, 0.25], $p < .001$, Nagelkerkes $R^2 = 0.03$).

Werling, Walitza, Grünblatt, Drechsler (2021) wanted to investigate the impact of the COVID-19 lockdown on **screen media behavior in a clinically referred sample** in child and adolescent psychiatry. They asked parents of children and adolescents (10-18 years) who had been in treatment in the last two years at one of the eight outpatient clinics of the Department of Child and Adolescent Psychiatry and Psychotherapy of the University of Zurich (CAPP) to participate in the online survey between May 30th and July 4th, 2020. The participants ($N = 477$) had to answer questions regarding the media use based on a paper-and-pencil screening questionnaire (PUI-Screening Questionnaire for Children and Adolescents, PUI-SQ) as well as questions regarding the treatment and the well-being of the children and adolescents. Each item was rated three times: retrospectively before the COVID-19 outbreak (January 2020), during the lockdown (March/April 2020) and during the last two weeks (June 2020/first week of July 2020). As hypothesized the results show an increased media time during and a decrease after lockdown. The repeated measures showed a significant main effect of time ($F = 200.375$, $p < .001$) as well as an interaction of time by gender ($F = 3.211$, $p = .044$). Gender-specific preferences showed an increase of gaming along boys (35% vs 4%) and social media in the female group (43% vs 17%). The main effect for gaming across time and the interaction of gaming by gender were significant (time: $F = 56.877$, $p < .001$; interaction $F = 23.570$, $p < .001$) as well as the effect across time for social media time ($F = 63.239$, $p < .001$) and a significant time by gender interaction ($F = 6.077$, $p < .003$). The analyses of the media time concern subscale score across the three time points showed a significant main effect for the changes over time ($p < .001$) while interactions of time by gender ($p = .070$) and time by gender by age ($p = .077$) were only significant by trend. In regard to the negative impact of media use on everyday life had been observed, that there was only a small increase of concern by the parents during lockdown (21–24% while approximately 5–10% of raters indicated a decrease) and then a subsequent return to pre-COVID-19 levels. The concern about the problem behaviors like aggressiveness and anger due to media use increased during lockdown in 18.8% and after the

lockdown this concern normalized again. The analysis about the effect of the lockdown on specific media-related problem behaviors and risks seemed to have very little effect according to parents' perception. Furthermore, parents had to indicate the changes of the main psychopathological problem since January. "The majority indicated no change (41.10%, $N = 196$), while an improvement of problems was reported by 37.7% of parents ($N = 180$), and a deterioration only by 21.2% ($N = 99$)." In the children group (10–13 years) the total media time was significantly more in those group with a deterioration than in those with no change or with an improvement of the psychopathological problem. Whereas in the adolescents' group (≥ 14 years) this effect was not found. Further must be noted that there was a significant positive relation between the indicated happiness of the child and the media time.

Suicidal thoughts/Suicide

Sivertsen et al. (2022) examined changes and prevalence of mental health problems, suicidal ideation and suicidal behaviour as well as their associations with COVID-19-related restrictions. As part of the SHoT-study (Students' Health and Well-being Study) in Norway, 62'498 students ($M_{age} = 24.1$, $SD = 5.2$) completed an online questionnaire in March 2021. These data were compared with previous waves from the SHoT-Study conducted in 2010, 2014 and 2018. Mental health problems were assessed with the Hopkins Symptoms Checklist, suicidal ideation, suicide attempts and non-suicidal self-harm (NSSH) with items from the Adult Psychiatric Morbidity Survey, and thoughts of NSSH with one item from the Child and Adolescent Self-Harm in Europe study.

Results revealed a significant increase in mental health problems from 2010 to 2021 (total sample, T1-2010: $M = 1.75$, $SD = 0.69$; T2-2014: $M = 1.87$, $SD = 0.71$; T3-2018: $M = 2.00$, $SD = 0.79$; T4-2021: $M = 2.27$, $SD = 0.78$; $p < .001$), and especially from 2018 (with 27% of the male participants and 45% of the female participants scoring above the 2.0 cut-off on the HSCL-5) to 2021 (men = 41%; women = 62%, $p < .001$). Furthermore, a significant increase in participants reporting "suicidal thoughts in the past two weeks" from 2010 to 2021 in both male participants (from 8.1% to 15.7%) and female participants (from 7.3% to 14.7%) was observed. The prevalence of NSSH within the past 12 months increased from 2018 to 2021 significantly for male (from 2.1% to 2.4%, $p < .05$), but not for female participants (4.9% to 4.8% 2.4%, $p < .49$). For NSSH thoughts, the same pattern was observed: there was an increase in male (from 4.5% to 5.0%, $p < .05$), but no change in female participants (from 10.8% to 10.5%, $p = .18$). No significant change in suicide attempts in the last 12 month was found. Further analysis indicated that there were large geographical differences in the prevalence of mental health problems: students studying in a region with higher number of COVID-

19 cases and therefore stricter containment measures reported significantly more mental health problems. In addition, students who spend 7+ days physically on campus in the last 14 days reported significantly fewer mental health problems compared to students who were not allowed on campus. A similar effect of days spent on campus was observed for recent NSSH, suicidal thoughts and suicide attempts.

Schluter et al. (2022) conducted a study to estimate and compare country-specific prevalence of suicide ideation at 2 different time points, overall and by gender and age groups, and (2) to investigate the influence of sociodemographic and infodemic variables on suicide ideation on two timepoint in varies countries (England, Belgium, and Switzerland). Comparing age-standardized rates of suicide ideation between T1 (May 29th to June 12th, 2020) and T2 (November 6th to 18th, 2020), significant increases were observed for participants in Belgium (mean difference .052, 95% CI [.017, .087]; $p = .004$), but not for participants in England ($p = .07$), Switzerland ($p = .86$). Overall, among women, those aged 18-24 years had the highest estimated proportion of indications at both timepoints (mean .389 and .458, respectively) and the greatest increase between timepoints (mean change .069). In Switzerland, men showed higher prevalence than women at both waves with decreasing prevalence by age for both gender with exception of 26-35 year-olds, who the highest prevalence at both timepoints (mean .414 and .468, respectively) and somewhat higher than 18-24 year-olds (mean .398 and .467, respectively). However, like female participants, the greatest increase in suicide ideation indications between Timepoints occurred for those aged 18-24 years. Crude ORs were adjusted by gender, age group, country, and measurement wave main effects together with interaction terms age group \times gender, country \times gender, age group \times country, and age group \times measurement wave identified in the previous analyses. In these analyses, both the main effect and interaction by measurement wave terms were significant for variables corresponding to self-isolation/quarantine ($p < .001$ and $p = .02$, respectively), financial losses ($p < .001$ and $p = .003$, respectively), and threat perceived for oneself and/or family ($p < .001$ and $p = .008$, respectively). However, significant main effect and nonsignificant interactions by measurement wave terms were identified for variables corresponding to being an essential worker ($p < .001$ and $p = .66$, respectively), being a victim of stigma ($p < .001$ and $p = .09$, respectively), trust in authorities score ($p < .001$ and $p = .49$, respectively), internet-based social media as a regular source of information ($p < .001$ and $p = .13$, respectively), friends/family/co-worker as a regular source of information ($p < .001$ and $p = .33$, respectively), and SOC ($p < .001$ and $p = .24$, respectively). This implies that these variables have a significant relationship with suicide ideation, which did not change between timepoints. A key finding was the rise and significance of internet-based social media as a regular

source of information associated with suicide ideation in the adjusted analyses. Moreover, with social media appearing to have an increasingly negative influence, it is critical for countries and health agencies to squarely redress rampant misinformation and disinformation communications.

A Study in Italy (Gatta et al., 2022) compared the population of patients admitted to a Neuropsychiatric Hospital one year before and through-out the pandemic, age 0 – 17 years. Half of inpatients showed psychiatric familiarity; 84% of inpatients of both groups had previously accessed neuropsychiatric services or had received other forms of help (e.g., psychological, psychotherapeutic, and/or psychiatric support). Suicidal ideation increased significantly from 45.1% to 53.8%, and a decrease in suicide attempts from 24.5% to 18.9% was found. Non-suicidal self-harm (NSSH) showed a non-significant small increase from 36.3% to 37.5%. All three outcomes increased significantly from wave 1 to wave 2. The variation in suicidal methods: in the COVID-19 year, there was an increase of suicidal attempts through drug or substance poisoning (from 40.0% to 66.7%) and through wrist cutting (from 4.0% to 11.1%) compared to the pre-COVID-19 year; while there was a reduction, from 56.0% to 22.2%, in suicidal methods classified in “other” (defenestration, falling from height, choking, and being hit by fast vehicles). Substance use increased from 7.9 to 9.7%, alcohol use 5 to 10.6%, and tobacco use statistically significant ($X^2 = 5.47$, $df = 1$, $p = .019$) from 5 to 14.9%. Relating to usage time of devices, in the pre-COVID-19 year 40% of inpatients used them less than four hours per day, while 60% of inpatients used them more than four hours per day. In the COVID-19 year the percentages were equally distributed (50% of inpatients used devices less than four hours per day and 50% more than four hours per day). Statistically significant differences between the two years ($X^2 = 14.0$, $df = 5$, $p = .015$) were also found in post-discharge admission to territorial mental health services: territorial outpatient treatments decreased both in public and in private services (from 70% in the pre-COVID-19 year to 46% in the COVID-19 year); an increase from 20% in the pre-COVID-19 year to 29% in the COVID-19 year was observed for residential and semi-residential care (e.g., residential therapeutic centers, daily centers, and eating disorders centers); an increase in intensive monitoring interventions by hospital and by social and family services (from 10% in the pre-COVID-19 year to 25% in the COVID-19 year).

"O'Connor (2021) investigated the trajectory of mental health and well-being during the first 6 weeks of lockdown in 3077 adults in the UK. **Suicidal ideation** increased over time, with respondents at wave 2 (9.2%; $OR = 1.17$, 95% CI [1.01, 1.34], $p = .031$) and wave 3 (9.8%; $OR = 1.24$, 95% CI [1.07, 1.44], $p = .005$) reporting higher levels than at wave 1 (8.2%). The difference between waves

2 and 3 was not statistically significant. 21% of the participants was above the cut-off point for moderate or severe levels of symptoms of anxiety at wave 1. However, these symptoms decreased across waves, with wave 2 (18.6%; $OR = 0.89$, 95% CI [0.81, 0.97], $p = .012$) and wave 3 (16.8%; $OR = 0.82$, 95% CI [0.74, 0.90], $p < .0001$) being lower than wave 1 (21%). Again, sig. between wave 2 and 3 not. sign. Subgroup analyses showed that women, young people (18–29 years), those from more socially disadvantaged backgrounds and those with pre-existing mental health problems have worse mental health outcomes during the pandemic across most factors."

A retrospective cohort study from Ougrin et al. (2021) analyzed the **self-harm behavior of children and adolescents** during lockdown in 10 different countries. The analysis included a total of 2073 acute hospital presentations by 1795 <18 years old children and adolescents. Data was compared from t1: March–April 2020 ($n = 834$) and t2: March–April 2019 ($n = 1239$). In 2020, there were significant more hospital visits due to self-harm than in 2019 ($p = .009$; $OR = 1.33$, 95% CI [1.07, 1.64]). Children and adolescents with a previous history of self-harm showed an increase in 2020 (from 29 to 36%, and from 63 to 71%). Among patients with an additional disorder, the emotional disorders increased significant with an estimated odds ratio (OR) of 1.58, 95% CI [1.06, 2.36]; $p = .025$.

Koenig et al. (2021) compared **emotional and behavior problems** (Strengths and Difficulties Questionnaire (SDQ)) self-reported **health-related quality of life** (KIDSCREEN (KS10)), **depression** (PHQ-A), **suicide thoughts** (Paykel Suicide Scale (PSS)) and eating disorders (Weight Concerns Scale (WCS); Eating Disorder Examination-Questionnaire (EDE-Q)) in a matched sample of adolescents (12- to -20-olds) using pre-pandemic (November 26th, 2018 to March 13th, 2020) and lockdown data (March 18th, 2020 to August 29th, 2020). This study found no evidence for an increase in emotional and behavioral problems, depression, thoughts of suicide or suicide attempts, eating disorder symptoms, or a decrease in general health-related quality of life, except a decrease in suicide plans ($OR_{adj} = 0.31$, 95% CI [0.13, 0.75], $p = .009$) and conduct problems ($b_{adj} = -0.16$, 95% CI [-0.31, -0.00], $p = .045$). Family risk-factors did not moderate these finding. The influence of socioeconomic status on emotional and behavioral problems as well as depression decreased during the lockdown. This result does not support other findings from Germany showing an increase of mental health problems during the lockdown. Small sample size and low prevalence of outcomes may be an explanation.

Regarding self-harm, a study on hospital presentations in England by Hawton et al. (2021) showed that during the first 12 weeks following the introduction of lockdown (23.03.2020 – 14.06.2020), the average **weekly number of self-harm presentations** was 30.6% lower than in the pre-lockdown period (06.01.2020 – 22.03.2020) and 37% lower during the equivalent period in 2019 (23.03.2019 – 14.06.2019). Compared pre-post-lockdown 2020, the reduction appeared to be more marked for presentations involving self-poisoning compared with self-injury. Furthermore, the reduction was greater in females than males, and with it was greater in 18- to 34-year-olds (presentations were reduced by 43.8% in that age group) than in older adults.

Knowles et al. (2022) examined the impacts of the COVID-19 pandemic and related social restrictions and school closures on adolescent mental health, particularly among disadvantaged, marginalized, and vulnerable groups in two socially and ethnically diverse boroughs in London, UK. They analyzed four waves of data: 3 pre-pandemic (2016-2019) and 1 mid-pandemic (May-August 2020; $N = 1074$; age range: 12–18 years) from the REACH study (Resilience, Ethnicity, and AdolesCent Mental Health). No evidence of an overall increase in the (weighted) prevalence of mental distress mid-pandemic (15.9%, 95% CI [13.0, 19.4]) compared with pre-pandemic (ranging from 17.1% to 18.3%) was found. This same pattern was observed for depression, anxiety, and **self-harm**. However, there were differences in changes in distress across the subgroups: A modest variation by gender, with a small increase in distress among the female participants (B [unstandardized beta coefficient] = 0.42, 95% CI [-0.19, 1.03]), mainly in internalizing scores, and a small reduction among male participants ($B = -0.59$; 95% CI [-1.25, 0.18]; p (interaction) = .007), primarily in externalizing scores was found. Analyses of variation in within-person change pre-COVID to mid-COVID revealed a strong evidence of variation by prior mental health problems (i.e., SDQ scores ≥ 18), with a modest decrease in overall distress among those with prior mental health problems ($B = -1.04$ [-1.88, 0.20]; p (interaction) = .002) and some evidence for variation by household affluence, with a small decrease in distress among young people from less affluent households pre-pandemic ($B = -1.12$ [-1.89, -0.36]; p (interaction) = .016). Further, there was evidence of an increase in distress among those who reported household financial problems ($B = 1.27$; 95% CI [-0.04, 2.58]), but no change among those who did not ($B = -0.36$ 95% CI [-0.96, 0.24]; p (interaction) = .008).

In a longitudinal study, Bouter et al. (2022) investigated the effect of the pandemic on adolescents' mental health in the Netherlands in a prospective cohort of 1022 adolescents (with a 2.5:1 ratio oversampling of adolescents on their emotional and behavioral problems). As part of the iBerry

(Investigating Behavioral and Emotional Risk in Rotterdam Youth) Study, depressive, anxiety, stress, and oppositional defiant problems as well as psychotic experiences and **suicidality** were assessed before the pandemic, using several subscales of the Youth Self-Report (YSR) from the Achenbach System of Empirically Based Assessment (ASEBA) ($M_{\text{age at baseline}} = 15.0$ years). 445 and 333 of these 1022 participants completed an online questionnaire during the first lockdown in April 2020 ($M_{\text{age at first lockdown assessment}} = 17.7$ years, $SD = 0.67$), and during the second lockdown in January 2021, respectively. Between the baseline and first lockdown assessment, an increase in depressive problems was observed ($B: 0.93$, 95% CI [0.43, 1.42]). However, there was a decrease in anxiety problems ($B: -0.58$, 95% CI [-0.94, -0.21]) and psychotic experiences ($B = -0.147$, 95% CI [-0.23, -0.07]), whereas stress problems ($B = 0.05$, 95% CI [-0.48, 0.59]), oppositional defiant problems ($B = 0.30$, 95% CI [-0.18, 0.24]), and suicidality ($B = -0.05$, 95% CI [-0.13, 0.03]) did not change. Between the first and second lockdown assessment there was an increase in depressive problems ($B = 2.20$, 95% CI [1.71, 2.70]) and stress problems ($B = 0.96$, 95% CI [0.43, 1.50]). In contrast, psychotic experiences ($B = -0.13$, 95% CI [-0.21, -0.05]) decreased, and anxiety problems ($B = -0.03$, 95% CI [-0.40, 0.34]), oppositional defiant problems ($B = -0.13$, 95% CI [-0.34, 0.08]), and suicidality ($B = 0.03$, 95% CI [-0.04, 0.11]) remained unchanged. Further analysis showed that participants who scored in the clinical range at baseline had the largest decrease in problem scores between baseline and first lockdown for anxiety problems (Cohen's $d = .22$), depressive problems ($d = .12$), oppositional defiant problems ($d = .12$), stress problems ($d = .19$), psychotic symptoms ($d = .15$), and suicidality ($d = .11$). The scores for these participants increased slightly between first and second lockdown assessment, with small effect sizes (Cohen's d ranging from .01 to .11). Participants who scored in the borderline range at baseline showed a similar pattern (although all effect sizes being small, with Cohen's d ranging from .00 to .07). Participants who scored in the normal range at baseline had an increase in scores between baseline and first lockdown assessment and again between first and second lockdown assessment, but all effect sizes were negligible (Cohen's d ranging from .00 to .04). Thus, majority of the participating adolescents reported having emotional and behavioral symptoms that were within the normal range. Among adolescents with high clinical severity prior to the pandemic, the mean symptom scores for all six outcomes decreased significantly.

Mental Health Care Utilization

"In the UK a controlled interrupted time series study by Chen, She et al. (2020) using data from Cambridgeshire and Peterborough NHS Foundation Trust (CPFT), UK (catchment population _0.86

million) found an instantaneous drop in **mental health** referrals but then a longer-term acceleration in the referral rate (by 1.21 referrals per day per day, 95% CI [0.41, 2.02]. This acceleration was primarily for urgent or emergency referrals (acceleration 0.96, 95% CI [0.39, 1.54]), including referrals to liaison psychiatry (0.68, 95% CI [0.35, 1.02]) and mental health crisis teams (0.61, 95% CI [0.20, 1.02]) in adults age 20 – 65 year old but was not seen in children and adolescents nor elderly. Authors discuss a potential insufficient of these vulnerable age groups to access mental health services."

Kose et al. (2021) analyzed the effects of the COVID-19 pandemic on child and **adolescent psychiatry emergency admissions**. Electronic patient records from a total of 427 patients presenting to the ED were retrospectively collected from the periods March 11th – June 11th, 2020 ($n = 66$), December 11th, 2019 – March 10th, 2020 ($n = 140$) and the same three-month periods in the previous year (March 11th – June 11th, 2019 ($n = 128$) and December 11th, 2018 – March 10th, 2019 ($n = 93$)). A poisson regression analysis revealed that during the pandemic period, the total number of psychiatric admissions to the emergency department **was significantly reduced** during the first wave (reference) as compared to the same period in the previous year (March 2019 – June 2019, IRR (95% CI) of 1.94 (1.44 – 2.80, $p = .000$), and the preceding period of December 2019 – March 2020, IRR = 2.12 (1.47 – 3.05, $p = .000$) which is corresponding to a 48.45% respectively 52.83% reduction in admission rates. A significant 70.58% reduction was observed in low-risk suicide attempts during the first wave compared to December 2018 – March 2019 (IRR = 3.40 (1.39 – 8.31, $p = .07$), the pre-pandemic period in the same year (IRR = 5.6 (2.39 – 13.13, $p < .000$) and the same period in the previous year IRR = 4.0 (1.66 – 9.62, $p = .002$), respectively. Furthermore, "a significant increase in incidence rate ratio in March 2019 - June 2019 IRR = 3.50 (1.25 – 9.82, $p = .017$) and December 2019 - March 2020 IRR = 4.75 (1.75 – 12.93, $p = .002$) was detected for patients presenting with alcohol or substance intoxication compared to the pandemic period of March 2020 - June 2020; translating to a 71.42% reduction from the previous year and a 78.94% reduction from the preceding pre-pandemic period."

Tromans et al. (2020) analyzed **secondary mental health service utilization** pre-lockdown and during lockdown within Leicestershire, UK. Registry data was collected retrospectively from electronic records for both, 8 weeks pre-lockdown and the first 8 weeks of the lockdown. There were no significant changes within hospitals admissions for children and adolescents (pre: $n = 14$, in: $n = 17$) but a significant decrease in referrals to mental health services for children and adolescents from pre-lockdown to lockdown (pre: $n = 2193$, in: $n = 1081$, $p = .001$).

A retrospective cohort study from Ougrin et al. (2021) analyzed the **self-harm behavior of children and adolescents** during lockdown in 10 different countries. The analysis included a total of 2073 acute hospital presentations by 1795 <18 years old children and adolescents. Data was compared from t1: March–April 2020 ($n = 834$) and t2: March–April 2019 ($n = 1239$). In 2020, there were significant more hospital visits due to self-harm than in 2019 ($p = 0,009$; $OR = 1.33$, 95% confidence interval 1.07–1.64). Children and adolescents with a previous history of self-harm showed an increase in 2020 (from 29 to 36%, and from 63 to 71%). Among patients with an additional disorder, the emotional disorders increased significant with an estimated odds ratio (OR) of 1.58, 95% confidence interval 1.06–2.36; $p = 0.025$.

Regarding self-harm, a study on hospital presentations in England by Hawton et al. (2021) showed that during the first 12 weeks following the introduction of lockdown (23.03.2020 – 14.06.2020), the average **weekly number of self-harm presentations** was 30.6% lower than in the pre-lockdown period (06.01.2020 – 22.03.2020) and 37% lower during the equivalent period in 2019 (23.03.2019 – 14.06.2019). Compared pre-post-lockdown 2020, the reduction appeared to be more marked for presentations involving self-poisoning compared with self-injury. Furthermore, the reduction was greater in females than males, and with it was greater in 18- to 34-year-olds (presentations were reduced by 43.8% in that age group) than in older adults

A study in the South of France (Davin-Casalena et al., 2021) resorted to regional insurance data to investigate **health care utilization in primary care**. It indicates that the initial stage of the lockdown was characterized by a decline in medical care, with a marked decrease in pediatrics (20%) and a small decrease in psychiatry (1.8%, includes adults psychiatrist), as well as a peak provisioning for drugs (no differentiation by age), whereas vaccination strongly declined. Vaccination of preventable childhood diseases dropped by 5% in under one - year-olds (900 Children), by 39% in under five-year old (4100 children) and Human Papilloma virus vaccination by 54% in 10 -14-year-olds (1200 girls). While vaccination numbers increased again after the lockdown, there is no evidence of a catch-up vaccination.

Carretier et al. (2021) report on the adaptation of care provision and consultations frequency in a "Maison de adolescents" which addresses different needs of adolescents and their families including **ambulatory consultations, day hospital and an in-patient unit** during the first half of

2020. They report a drop compared to 2019 in overall and mental health specific consultations in Jan/Feb (ca. 5 - 15%) and an increase in Mars to June (ca. 5 - 20%).

Mourouvaye et al. (2021) measured in a French pediatric hospital (retrospective observational study) the number of admissions for suicide behavior ($N = 234$), before and during the early pandemic (March 16th – May 10th, 2020). The number of admissions for suicide behavior was 2.5 ($SD = 1.7$) and 1.25 ($SD = 1.28$) per week during period 1 and period 2, respectively. The incidence of admissions for suicidal behavior was also lower during summer breaks (0.88, $SD = 1.45$ per week). In Poisson univariate regression, there was a significant association between the lockdown and the average number of admissions for suicidal behaviors (crude IRR 0.51, 95% CI [0.27, 0.95], $p = .034$). This association remained significant in multivariate Poisson regression adjusted for the effect of summer breaks (adjusted IRR 0.46, 95% CI [0.24, 0.86], $p = .016$). In 2018–2019, rates of admissions per week did not differ between March and May compared with the rest of the year (2.75, $SD = 1.54$; vs 2.275, $SD = 1.68$), respectively; Poisson IRR 1.21, 95% CI [0.91, 1.60]; $p = .19$). Together, the number of admissions of children and adolescents with suicide behaviors decreased during the lockdown by 50 percent. The processes underlying these changes and the question whether they were rebounds after the end of the lockdown are not clear yet.

Rømer et al. (2021) conducted a time-trend study to assess patterns in psychiatric admissions, referrals, and suicidal behavior before and during the COVID-19 pandemic using data from hospital and Emergency Medical Services (EMS) health records covering 46% of the Danish population ($n = 2'693'924$). They compared data on the number of psychiatric in-patients, referrals to mental health services as well as suicidal behavior (such as self-harm, suicide attempts, and suicide) in the years before the COVID-19 pandemic to data during the first lockdown from March 11th and May 17th, 2020), the inter-lockdown period from May 18th – December 15th, 2020), and the second lockdown from December 16th, 2020 – February 28th, 2021. In the age group <18, the annual number of in-patient at psychiatric clinics increased by 3.2% from 2018 to 2019 (744 vs. 768) and further by 7.4% from 2019 to 2020 (768 vs. 825). The rate of psychiatric hospitalizations among children and adolescents was increased by 11% during the pandemic ($RR = 1.11$, 95% CI [1.07; 1.15], $p < .01$), however, this increase did not significantly exceed the pre-pandemic, upwards trend in psychiatric hospitalizations among this age group ($p = 0.78$). The rate of referrals to mental health services during the pandemic were not significantly different among children and adolescents after adjusting for multiple testing ($p = .07$), nor was it significantly different from the pre-pandemic trend (Ratio = 1.37, CI = 0.97 – 1.93, $p = 0.28$). Hospital-recorded suicidal behavior decreased by 4.4% from 2019

to 2020 (295 vs. 282 events); however, it reached 124 events by February 28th, 2021, accounting for 46.1% of total suicidal behavior events in that period across all the age groups. In the EMS data, the age group <18 accounted for 5.2% of suicidal behavior events in 2019, 5.9% in 2020 and 9.0% in 2021 (January and February only). The weekly number of EMS-registered suicidal events was low (range = 0–8), therefore monthly counts were used and revealed no significant change in suicidal behavior after adjusting for multiple testing ($p = .06$) among the age group <18.

Overview and comparison of recommendations and best practice in different countries

Summary

The aim is to identify recommendations and best practice examples in the literature on COVID-19 and secondary mental health impact. To categorize the findings, we used the Behaviour Change Wheel from Michie et al. (2014), which defines different policy categories, intervention functions and sources of behavior relevant to successful interventions. The data highlight what is already receiving attention in the literature. We found the most recommendations for the policy categories Service provision, Guidelines, and Marketing/Communication. For the other four categories (Legislation, Environmental/Social planning, Fiscal measures and Regulation) fewer recommendations were made.

The COVID-19 literature indicates not only the relevant outcomes and trends, but also points to possible deficits and opportunities for change. The recommendations underline the relevance to not only strive for quick, short-term changes but for long-term, sustainable improvements of mental health. In the end, interventions which worked before the pandemic also work in the pandemic. It is therefore inevitable to secure the access to these services in the event of a pandemic and implement containment measures in a way that epidemiological benefits are weighed against potential adverse effect on the mental health on children, adolescents, and young adults.

Number of publications: 42

Time period: January 2020 – July 2022

Short introduction to the Behaviour Change Wheel

The Behaviour Change Wheel from Michie et al., (2014, see Figure 1) can be used as a framework for conceptualizing the design and implementation of interventions.

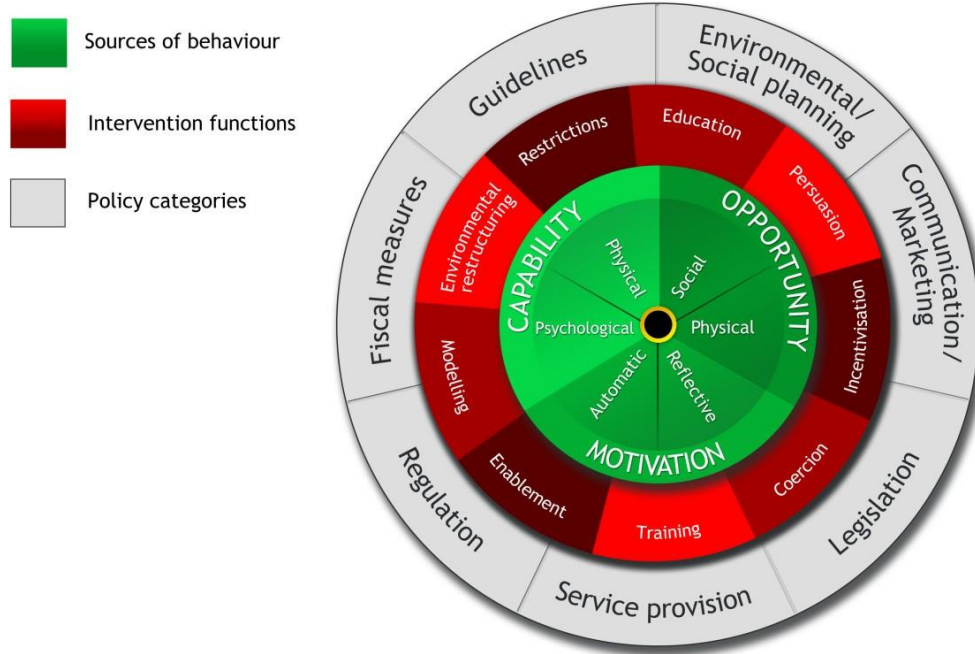


Figure 1. The Behaviour Change Wheel (Michie et al., 2014)

This integrative model considers elements and conditions of interventions, e.g., motivation, enablement, or financial incentives, which are relevant to initiate or support interventions. It involves different steps across the three layers of the wheel: in the middle, sources of behavior are identified, which could be targets for intervention. The second layer consists of nine intervention functions, which can lead to a change in behavior (e.g., “Enablement”, “Training” or “Environmental restructuring”). The seven different policy categories “Environmental/Social planning”, “Communication/Marketing”, “Legislation”, “Service provision”, “Regulation”, “Fiscal measures” and “Guidelines” are placed in the outer layer of the wheel. They can be used to enable or deliver the intervention (Michie et al., 2014, see Figure 2). When developing an intervention, all three levels should be considered.

Policy Category	Definition
Communication/marketing	Using print, electronic, telephonic or broadcast media

Guidelines	Creating documents that recommend or mandate practice. This includes all changes to service provision
Fiscal measures	Using the tax system to reduce or increase the financial cost
Regulation	Establishing rules or principles of behaviour or practice
Legislation	Making or changing laws
Environmental/social planning	Designing and/or controlling the physical or social environment
Service provision	Delivering a service

Figure 2. Policy Categories according to Michie et al.'s (2014) Behaviour Change Wheel

To give an overview of the individual recommendations on future steps for improved mental health and policy decisions, we have grouped the recommendations from the various scientific articles into the 7 policy categories of the Behaviour Change Wheel (see Appendix 2). It is well apparent that most of the recommendations are in “Service provision, Guidelines and Marketing/Communication” while we encountered fewer recommendations in the areas of “Environmental/social planning, Regulation”, and just two in “Fiscal measures” (see Figure 3).

Therefore, targeted individualized approaches are needed to help them “catch-up” as well as non-stigmatizing interventions to support young people living in households directly impacted by the economic and social consequences (Knowles et al, 2022). Under “Expansion of low-threshold (digital) mental health services” the expansion of psychological counseling centers and family education centers is recommended, to increase low-threshold services for parents and children. (Liang et al., 2021; Bringolf-Isler et al., 2021). The literature identifies the loss of subjective well-being, as one of the most important one to work on (Steinmayr et al., 2022). “Interventions in educational setting/context” was addressed quite frequently. Regarding educational settings, it was recommended that educational programs for parents should enable them to take care of a healthy sleep of their children (Cellini et al., 2021; Ravens-Sieberer et al., 2021). It is further suggested that day care centers/kindergartens must work out didactic and organizational models for keeping them functional in case of a new lockdown (Quenzer-Alfred et al., 2021). Thus, prioritizing providing necessary resources for online learning and ensuring certainty around the format and process for exams and grading (Knowles et al., 2022). In addition, schools should provide the opportunity to compensate for the lack of contact, such as peer programs or buddy systems at/or events (Kulcar et al., 2022). Finally, “...collaborative networks between parents, teachers, pediatricians, psychologist, psychiatrist ... need to be put in place” (Nakanishi et al., 2022). In the last sub-category “Recommendations of specific interventions”, interventions aimed to strengthen adaptive emotional regulation strategies (Pedrini et al., 2022), reducing loneliness by enhancing social relationships (Hafstad et al., 2022), strengthen digital/online methods of communication (Hards et al., 2022), to target preventative measures for psychoactive substances (Spinelli et al., 2021) as well as enhancing internal resources of children and adolescents (Koelen et., 2021). Overall, activities should target specific subpopulations based on socio-demographic and socio-economic background, considering neighborhood characteristics and the evolvement of the pandemic. (Camerini et al., 2022).

Guidelines

In the areas of guidelines, authors advocated for a greater focus on mental health. For example, provisions of digital mental health services should be scaled up besides existing facilities available on campuses (Sivertsen et al., 2022). Important to notice, that interventions, which worked before the pandemic also work in the pandemic, such as acceptance- and awareness-based coping and mindfulness, brief dialectical behavior therapy - development of distress tolerance skills, expressive writing, interventions targeting self-compassion or positive affect, cognitive behavioral therapy (CBT) interventions, targeting coping skills, and the provision of social support, efforts to refocus on

their personal values and setting meaningful goals, grit and gratitude interventions targeting subjective well-being. Further, screening routines for prevention and treatment should be implemented in programs for children's mental health (Oliveira et al., 2021), besides very clear guidance around what is and is not allowed when restrictions are in place (Asbury & Toseeb., 2022).

Communication/Marketing

We often accommodated recommendations in the area of Communication/Marketing. Recommendations ranged from "Use positive communication", specifically, avoiding the use of coercive strategies based on eliciting emotions (Alivernini et al., 2020) to "Targeted communication for all generations". Here authors suggested an expansion of low-threshold, digital support services. Certainly, a measure that could be used to reach young people directly (Naumann et al., 2021) and stronger "Destigmatizations of mental health support" (Ravens-Sieberer et al., 2021). In addition, there were many calls for "increasing awareness for mental health", specifically on the topic's loneliness in young people (Hards et al., 2022), potential detrimental impact of screen time on mental health (Camerini et al., 2022), depressive symptoms also affecting adolescents from low-risk environments (Vacaru et al., 2022) and the risk with the pandemic in increasing Eating Disorder (Spina et al., 2022).

Environmental/social planning

In the area of "Environmental/social planning" there is a call for more "safe space for youth". Authors point out that adolescents need private spaces for completing homework and spending time alone. It improves learning gains and strengthens their mental health (Ertanir et al., 2021). Also, to promote better mental health safe green spaces and green time during pandemic should be provided (Camerini et al., 2022).

Legislation

Here the focus was laid on "Supporting parents/families" and "Access to protective factors". To support parents and families, policies should be address firstly, concrete measures to support parents not only with technical issues but also to help combining jobs and parental support of children's learning experiences at home (Pozzoli et al., 2021). Secondly, a range of support has to be provided for young people and their families in different intensity levels (parent-led self-help approaches to computerized CBT-based programs with therapist input) (Hards et al., 2022) and, lastly, development of structures for social and educational sharing to increase awareness among

families and pediatricians of the mental risk with the pandemic (Spina et al., 2022). It should be ensured that children can benefit from protective factors such as leisure activities, physical activity, and social contact. This includes avoiding the closure of schools (Bringolf-Isler et al. 2021). A topic of great importance already prior to the pandemic is alcohol prevention was also mentioned.

Regulation

In order to be prepared for further pandemics, to do so the literature has offered suggestions for a different implementation for containment measures. It is recommended that “risk criteria” and the definition of risk populations for delivery of care, e.g., for the delivery of vaccinations, need to be changed. Psychological and developmental vulnerabilities must be included as risk criteria for early vaccination access (Alt et al., 2021). Secondly, epidemiological benefits of closing schools must be weighed against the potential adverse effects on mental health and health behaviors in children (Hoefnagels et al., 2022), thirdly, containment measures should be implemented in a way that allows maintenance of social contacts (Kulcar et al., 2022) and adolescents pandemic mitigation measures must be kept to a bare minimum (Hafstad et al., 2022)

Fiscal measures

Finally, regarding “Fiscal measures” authors recommend faster and better financial support for children from low socioeconomic backgrounds is needed (Ravens-Sieberer et al., 2021). While few studies pointed to the need for fiscal measures, the suggested interventions, services or structural changes do of course have fiscal consequences (e.g., educational programs to promote children’s emotional-regulation skills, Pozzoli et al., 2021).

Available Swiss published data

In the recent reports we presented published data based on Swiss data and some grey literature regarding both somatic and mental health. For the current mandate and report we include an outlook on the publications still to be expected based on a directed and general request to Covid-19 researchers, child and adolescent stakeholders and Swiss Public Health academics to add information on a padlet (see appendix 3). The padlet focused on *Impact of Covid-19 containment measures on mental health, physical activity, nutrition, or media consumption in children (<12 years), adolescents (13-17 years), and young adults (18-25 years)*.

Overall, we identified a rather small number of scientific publications. The publications we found provide insights in emotional distress (Shanahan et al., 2022) (Markovic et al., 2021), sleep and health-related characteristics, (Albrecht, Werner, Rieger, Jenni, et al., 2022), screen time, (Camerini et al., 2022), (Werling, Walitza, & Drechsler, 2021), (Werling, Walitza, Grünblatt, et al., 2021), green time, (Camerini et al., 2022), Quality of Life, (Benzing et al., 2022), Physical Activity (Benzing et al., 2022), Alcohol consumption (Zysset et al., 2022), Education (Grätz & Lipps, 2021), (Tomasik et al., 2021), Well-being (Mohler-Kuo et al., 2021), (Caviezel Schmitz & Krüger, 2020), (Quervain et al., 2021) and (Ehrler et al., 2021). One international study on self-harm included Swiss data (Schluter et al. 2022). We identified no paper regarding the (mental) health care utilization.

The padlet identified three additional publications on longitudinal mental health studies, which we included in this report. Further publications provided by the national stakeholders and researchers which did not meet our inclusion criteria for the report are listed in an overview table (see appendix). In addition, the overview contains completed and ongoing projects in Swiss children and youth, already published and planned future publications based on Swiss data as well as contact data of authors or project groups.

In the area of planned publications, we can refer to the SOPHYA2 report (Bringolf-Isler et al.) as well as several prospective publications of the z-proso group. For example: early adolescents' predictors of young adults coping (Steinhoff et al.), Trend of substance use and other addictive behavior among young adults in Zurich (Leos-Toro et al.) or Risk and Resiliences (Shanahan et al.). Further publications on suicidal ideation (Dumont et al.) are to be expected. Impact of the COVID-19 pandemic on children's and adolescents' quality of life and mental health (Richard et al.) or post-COVID syndrome in children and adolescents (Dumont et al.) will also follow.

Further, there are also some interesting research projects to highlight, which may further analyze their data, for example, the Covid-19 Social Monitor of the University of Bern, or the SEROCO-KIDS cohort Study of the University Hospital of Geneva, the ZHAW "HEalth in Students during the Corona pandemic" study (HES-C) and the COSMO Study of the Scuola universitaria professionale della Svizzera italiana (SUPSI). More details can be found in the appendix.

Literature screening report: Secondary impact of COVID-19 containment measures in children, adolescents, and young adults: mental health and recommendations - 31.07.2022 - Julia Dratva, Frank Wieber, Simona Marti, Anthony Klein.

The Padlet will be online till the end of the year and data can be added continuously. It will be openly accessible for everyone who has the link. The link will be published in this report and on the ZHAW Project Website (<https://www.zhaw.ch/en/health/health-research-and-development/public-health-research/projects-public-health/translate-to-english-literature-recherche-im-auftrag-von-ssph-und-bag/>).

Link to padlet: <https://padlet.com/klii/sb4skj64qoi24dbe>

Number of publications: 14 included in Reports of Phase 1-3

Time period: January 2020 – July 2022

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All references: see .ris files

Appendix 1 – Literature search string

(lockdown[tiab] OR social distanc*[tiab] OR social isolation[tiab] OR quarantine[tiab] OR school closure[tiab] OR public health[tiab] OR community[tiab] OR anxiety[tiab] OR depress*[tiab] OR loneliness[tiab] OR suicid* [tiab] OR mental health[tiab] OR stress[tiab] OR child abuse[tiab] OR neglect[tiab] OR disorder*[tiab] OR school[tiab] OR education[tiab] OR delay[tiab] OR learning[tiab] OR secondary pandem*[tiab] OR consequence*[tiab] OR impact[tiab] OR effect*[tiab] OR implicat*[tiab]) AND ("Coronavirus"[Mesh] OR corona[tiab] OR coronavirus[tiab] OR covid-19[tiab]) AND ("Adolescent"[Mesh] OR "Child"[Mesh] OR "Infant"[Mesh] OR child*[tiab] OR adolescen*[tiab] OR infant*[tiab] OR pediatric[tiab] OR paediatric[tiab] OR maternal[tiab] OR paternal[tiab] OR "young adult*" [tiab]) AND ("Cohort studies"[MeSH] OR "cohort stud*" [All Fields] OR "longitudinal studies"[MeSH] OR "longitudinal stud*" [All Fields] OR longitudud*[All Fields] OR "prospective studies"[MeSH] OR "prospective stud*" [All Fields] OR "follow-up studies"[MeSH] OR "follow-up stud*" [All Fields] OR follow-up[All Fields] OR "retrospective studies"[MeSH] OR "retrospective stud*" [All Fields] OR "repeated cross-sectional"[All Fields] OR "repeatedly cross-sectional"[All Fields] OR "trend stud*" [All Fields])

Appendix 2- Overview Recommendation

Level 0	Level 1	Level 2	Level 3
Recommendations			
Guidelines			
<p>Use positive communication</p> <p>Cover masks with contrasting patterns or a static smile. (Romeo, 2021) Targeted communication and intervention should avoid the use of coercive strategies based on eliciting emotions (such as shame/guilt) as these could have an inverse effect. (Alivernini et al., 2020)</p> <p>Intraindividual difficulties in emotion regulation should be considered; providing potential anchors for prevention approaches. (Paschke et al., 2021) Mental health status should be considered when identifying high risk populations of young adults during health crises. (Vera et al., 2021) Identifying adolescents who are worried about infection, school, and other health and social consequences of the pandemic and without understanding whether those worries are perceived or genuine and what other risk factors may be associated with them. (Burczovic Andreas & Brunborg, 2021) Scaling up the provision of digital mental health services in addition to existing facilities available on campuses. (Sivertsen et al., 2022) School and communities have to identify and support young people living in households directly impacted by the economic and social consequences – in non-stigmatizing ways – by schools and communities to prevent initial, understandable distress from crystallizing into long-term, more intractable disorders. (Knowles et al., 2022) The presence of a psychiatric comorbidity, as well as an increase of serum creatinine and/or reduction of albumin level, should be considered as potential severity indices of Eating Disorder. (Spina et al., 2022) Providing very clear guidance around what is and is not allowed when restrictions are in place. (Asbury & Toseeb, 2022) Existing support should be kept in place in whatever form is possible. (Asbury & Toseeb, 2022) Implement durable measures in youngsters focused on prevention, promotion and care. (Lorca-Bofi et al., 2022) Keeping a daily routine, physical activity and exercise, and positive reappraisal/reframing can have positive effects on well-being. (Shanahan et al., 2022) Increasing happiness should be a part of intervention strategies. (Koelen et al., 2021) Catching up socially and emotionally should be prioritized in the same way as catching up academically. Targeted individualized approach for Youth with pre-existing mental health problems them to "catch-up". (Hards et al., 2022) Programs for children's mental health should be implemented with screening routines, interventions for prevention and treatment. (Oliveira et al., 2021) Interventions, which work before the pandemic also work in the pandemic. (Pantelli et al., 2022) Such as acceptance- and awareness-based coping and mindfulness, brief dialectical behavior therapy - development of distress tolerance skills, expressive writing, interventions targeting self-compassion or positive affect, cognitive behavioral therapy (CBT) interventions, targeting coping skills, and the provision of social support, efforts to refocus on their personal values and setting meaningful goals, grit and gratitude interventions targeting subjective well-being.</p>			
Environmental / social planning			
<p>Safe space for youth</p> <p>Adolescence need private spaces for completing homework and spending time alone. It improves learning gains and strengthens their mental health. (Erfanir et al., 2021) Binge drinking behavior in college students can be curbed when the contexts in which alcohol intake typically takes place are suppressed. (Vasconcelos et al., 2021) Provision of safe green space and promoting green time during the pandemic, especially among girls, to preserve and promote better mental health. (Camerini et al., 2022) Children should be enabled to profit from protective factors such as leisure activities, physical activity and social contact. This includes avoiding the closure of schools. (Bringolf-Isler et al., 2021)</p>			

	Legislation	Service provision
Alcohol prevention	<p>Also alternatives to hours spent on the internet such as secure outdoor activities should be encouraged. (Oliveira et al., 2021)</p> <p>Binge drinking behavior in college students can be curbed when the contexts in which alcohol intake typically takes place are suppressed." (Vasconcelos et al. 2021)</p>	<p>Targeted interventions for young adults which focus specifically on females, those with a lower income, and with pre-existing mental health conditions are needed. (Stroud & Guzman, 2021)</p> <p>Targeted and low-threshold prevention and early intervention measures should be initiated for children from socially deprived backgrounds. (Ravens-Sieberer et al., 2021)</p> <p>Families of children at risk for neurodevelopmental impairments should receive individualized counseling from health-care providers about the child's medical risk as well as additional school assistance during home schooling. (Ehlers et al., 2021)</p> <p>Targeted and efficient preventative measures for psychoactive substances by addictions and physicians in the context of a major public health problem and increased psychiatric morbidity related to COVID-19 infection. (Spinelli et al., 2021)</p> <p>Mental health status should be considered when identifying high risk populations of young adults during health crises. (Vera et al., 2021)</p> <p>School and communities have to identify and support young people living in households directly impacted by the economic and social consequences – in non-stigmatizing ways – by schools and communities to prevent initial, understandable distress from crystallizing into long-term, more intractable disorders. (Knowles et al. 2022)</p> <p>Catching up socially and emotionally should be prioritized in the same way as catching up academically. Targeted individualized approach for youth with pre-existing mental health problems them to "catch-up". (Hards et al., 2022)</p> <p>A pressing and particular priority lies with access of mental health support for autistic children who had to interrupt support during the pandemic and mental health support in general. (Asbury & Toseeb, 2022)</p>
Access to protective factors	<p>Children should be enabled to profit from protective factors such as leisure activities, physical activity and social contact. This includes avoiding the closure of schools. (Bringolf-Isler et al. 2021)</p> <p>To support recovery of life satisfaction among young people policies are needed that ease behavioral restrictions, emphasise economic recovery, and minimise disruptions to learning. (Henseke et al., 2022)</p>	<p>Interventions aimed at strengthening adaptive emotional regulation strategies are recommended. (Pedrini et al., 2022)</p> <p>Interventions for the general youth population aimed at reducing loneliness and enhancing social relationships in times of crises. (Hatstad et al., 2022)</p>
Parents/Families	<p>Encouragement of parents to seek help and use counseling and crisis services. (Ravens-Sieberer et al., 2021)</p> <p>Provision of a range of support readily available for young people and their families. At the lower levels of intensity, parent-led self-help approaches (e.g. Creswell, Parkinson, Thirlwall, & Willeits, 2019) and computerized CBT-based programmes with therapist input may be useful. (Hards et al., 2022)</p> <p>Development of structures where social and educational sharing can occur to increase awareness among families and pediatricians of the mental risk with the pandemic and to be able to monitor any signs of symptoms of Eating Disorder. (Spina et al., 2022)</p> <p>A policy implication is that governments take concrete measures to support parents, not only with technical issues (e.g., by providing tablets, computers, and internet connections) but also with social policies to help parents combine their jobs with the need to support their children in their learning experience at home. (Pozzoli et al., 2021)</p>	
Supporting Parents/Families		

<p>Programs for children's mental health should be implemented with screening routines, interventions for prevention and treatment. Also alternatives to hours spent on the internet such as secure outdoor activities should be encouraged. (Oliveira et al., 2021)</p> <p>Provide help to young people to feel part of a group, and experiencing social rewards may help reduce loneliness.</p> <p>Strengthen digital/online methods of communication to maintain social relationships during enforced social isolation as a mental health prevention. (Hards et al., 2022)</p> <p>Promotional activities should be targeted to specific subpopulations based on socio-demographic and socio-economic background, considering neighborhood characteristics and the involvement of the pandemic. (Camerini et al., 2022)</p> <p>Targeted and efficient preventative measures for psychoactive substances by addictionists and physicians in the context of a major public health problem and increased psychiatric morbidity related to COVID-19 infection. (Spinelli et al., 2021)</p> <p>The need of fit-for-purpose measurements and measures increasing child health generally (i.e., during the long phase out of the pandemic, before and during future pandemics) as the prepandemic behaviors predict during-pandemic behaviors. (Kurz et al., 2022)</p> <p>Enhancing "internal resources" (such as being able to accept or positively-appraise events, or to put things into perspective). A recent brief intervention for adolescents has shown promising results in creating a "growth mindset" (Schneider & Weisz, 2016, 2018). (Koelen et al., 2021)</p> <p>Interventions to enhance emotional support and to strengthen adaptive coping. For example, proactively develop strategies during a pandemic to promote bringing young people together within the applied restrictions. (Koelen et al., 2021)</p>	<p>Expansion of low-threshold mental health services</p> <p>An expansion of psychological counseling centers, family education centers and outpatient and inpatient therapy places would be one way to accompany the risk groups. As well an expansion of low-threshold, digital support services is certainly a measure that could be used to reach young people directly. (Neumann et al., 2021)</p> <p>Parents should be supported if they feel stressed, as parents and children's stress are intertwined. Consequently, low threshold contact points providing psychosocial support should be available for both children and their parents. (Bringolf-Isler et al., 2021)</p> <p>Government and public health should provide active assistance measures, such as online psychological counseling, to provide psychological guidance and intervention for parents and young people. (Liang et al., 2021)</p> <p>Lowering the threshold access to support services. (Ravens-Sieberer et al., 2021)</p> <p>Schools should provide trainings fostering subjective well-being (SWB). (Steinmayr et al., 2022)</p> <p>It is of societal importance not only to overcome the achievement loss due to the school lockdowns (Engzell et al., 2021) but also to address students' loss in subjective well-being. (Steinmayr et al., 2022)</p> <p>Teachers should find new and specific ways to engage students, to increase their closeness with students and promote learning. (Boekaerts & Pekrun, 2016)</p> <p>Teacher trainings to move their professional and human competencies (i.e., social and emotional skills) from the classroom to the online context. (Pozzoli et al., 2021)</p> <p>Increase specialist mental health services to deal with an increase in demand and provision of evidence-based treatments in a timely and accessible manner, including remotely where necessary. (Hards et al., 2022)</p>	<p>Interventions in educational settings/context</p> <p>Sleep health education through parents. (Cellini et al., 2021)</p> <p>Expansion of educational support and services such as virtual parent consultation hours, implementation of tutoring services and specialized and individualized support for students with special educational needs. (Ravens-Sieberer et al., 2021)</p> <p>Cognitive behavioral therapy for insomnia, interventions related to a treatment of a possible post-traumatic stress disorder, chronobiotic therapies for delayed bedtimes. (Cellini et al., 2021)</p> <p>Interventions could focus on increasing stressregulating abilities, emotional support, well-being/happiness, and on reducing loneliness. (Koelen et al., 2021)</p> <p>Didactic and organisational models need to be developed, which help nursery professionals and other teachers to establish a positive educational relationship even in circumstances of a shutdown. (Quenzer-Alfred et al., 2021)</p> <p>The support of socio-sanitary policies towards territorial development, neuropsychiatric and psychological services. (Gatta et al., 2022)</p> <p>Prioritising in-school teaching, providing necessary resources (e.g. computer and internet access) for online learning, and ensuring certainty around for-mat and processes for exams and for grading. (Knowles et al., 2022)</p>
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	<p>Regulation</p>	<p>Beneficial sleep associations that may counteract the negative outcomes should be considered when implementing school closures. (Albrecht et al., 2022)</p> <p>Providing young adults the opportunity to compensate for the lack of contacts during the pandemic, such as university peer and buddy systems at or events. (Kulcar et al., 2022)</p> <p>Investment in good career development activities and guidance to decrease career-related worries emerging as strong predictors of life satisfactions (Henseke et al., 2022)</p> <p>Collaborative networks between parents, teachers, pediatricians, psychologists, psychiatrists, neurologists, other health professionals, and public health policy managers. (Viola & Nunes, 2021)</p> <p>Clinicians and researchers should set as a priority the development of interventions targeting the reduction of unpleasant feelings and stress in individuals known to have experienced increased negative emotions and internalizing symptoms during the prepandemic period. (Pantelli et al., 2022)</p> <p>Psychosocial and educational support for young carers. Careful consideration is warranted to support adolescent carers to return to school and catch up with studies and other students. (Nakanishi et al., 2022)</p>
<p>Fiscal measures</p>	<p>Containment measures policy/implementation</p>	<p>Including psychological and developmental vulnerabilities to the risk criteria for determining the vaccination order. So it will be possible to vaccinate young people at risk earlier so that they are entitled to participate in social life sooner. (Alt et al., 2021)</p> <p>Looking at students pursuing higher education as a vulnerable group. (Sivertsen et al., 2022)</p> <p>Epidemiological benefits of closing schools for infectious disease control must be weighed against the potential adverse effects on mental wellbeing and health behaviours in children. (Hoefnagels et al., 2022)</p> <p>Containment measures should be implemented in a way that allows maintenance of social contacts (e.g. contact clusters) (Kulcar et al., 2022)</p> <p>Adolescent pandemic mitigation measures must be kept to a bare minimum. (Hatstad et al., 2022)</p>
<p>Communication/Marketing</p>	<p>Financial Support</p> <p>Destigmatization of mental health support</p> <p>Targeted communication for all generations</p>	<p>Targeted and low-threshold prevention and early intervention measures for financial support for children from socially deprived backgrounds. (Ravens-Seiber et al., 2021)</p> <p>Investing in educational programs aimed at promoting children's and youths' emotional-regulation skills to deal with learning challenges, including those that emerge in particularly stressful times. (Pozzoli et al., 2021)</p> <p>With the aim to "build back fairer" an inclusive policy should recognise the role of families, communities, and institutions in challenging heteronormative and cis-normative discourses, and supporting sexual minority young people. Examples include a stronger provision of safe spaces in the community and in institutions, policies that address marginalisation and harassment (including online) of sexual minority populations, and increased support for charities and organisations that work with and for the community. (Becares & Kneale, 2022)</p> <p>Destigmatization of mental health support. (Ravens-Seiber et al., 2021)</p> <p>Encouragement of parents to seek help and use counseling and crisis services. (Ravens-Seiber et al., 2021)</p> <p>Public health messages regarding the importance of sleep schedules and sleep quality disseminated by health/school authorities. (Cellini et al., 2021)</p> <p>Expansion of low-threshold, digital support services is certainly a measure that could be used to reach young people directly. (Neumann et al., 2021)</p> <p>Targeted communication and intervention should avoid the use of coercive strategies based on eliciting emotions (such as shame/guilt) as these could have an inverse effect. (Alivermini et al., 2020)</p> <p>Efforts to reach out to the general youth population with preventive measures in schools to identify those in need of more targeted mental health interventions. (Lehmann et al., 2022)</p> <p>Awareness-raising actions related to mental health problems in the juvenile population. (Gatta et al., 2022)</p>

Increasing awareness for mental health

Increase awareness and management skills among parents/guardians and teachers for signs of loneliness in young people. (Hards et al., 2022)
 Raise awareness of the potential detrimental impact of screen time (ST) on mental health. (Camerini et al., 2022)
 Increase awareness for depressive symptoms which may also affect adolescents from low-risk environments among parents, teachers, and others in contact with adolescents. (Vacaru et al., 2022)
 Development of structures where social and educational sharing can occur to increase awareness among families and pediatricians of the mental risk with the pandemic and to be able to monitor any signs of symptoms of Eating Disorder. (Spina et al., 2022)

Appendix 3 – Padlet overview

Contacts	Infos	Webseite
Prof. Dr. Julia Dratva	julia.dratva@zhaw.ch Institut für Public Health Zürcher Hochschule für Angewandte Wissenschaften https://www.zhaw.ch/de/gesundheit/forschung/forschung-public-health/	https://www.zhaw.ch/de/ueberuns/person/drat/
Prof. Dr. Frank Wieber	frank.wieber@zhaw.ch Institut für Public Health Zürcher Hochschule für Angewandte Wissenschaften	https://www.zhaw.ch/de/ueberuns/person/wieb/
Prof. Dr. Dominique De Quervain	dominique.dequervain@unibas.ch Universität Basel	https://psychologie.unibas.ch/de/personen/dominique-de-quervain/
Dr. Flavia Wehrle	flavia.wehrle@kispi.uzh.ch Child Development Center, University Children's Hospital Zurich	https://www.kispi.uzh.ch/forschungszentrum/person/wehrle-flavia
PD Dr. Kaspar Staub	Anthropometrics & Historical Epidemiology Research Group, Institute of Evolutionary Medicine, University of Zurich Background: I have ca. 15 years of experience in analysing health monitoring data from Swiss conscripts (>90% coverage of young Swiss men aged 18-22 years with Swiss citizenship), focus on nutritional status (excess weight, sports test results, etc.). I am also member of the scientific board of the MKM. https://www.vtg.admin.ch/de/organisation/astab/san/mkm/forschung.html	https://www.lem.uzh.ch/en/people/anthroposcan/kasparstaub.html
Prof. Dr. Martin Tomasik (UZH)	Research on learning outcomes using data from a computer-based formative feedback system for students in primary and secondary schools	https://www.ibe.uzh.ch/de/aboutus/team/tomasik.html
Prof. Dr. Stephan Huber	Schulbarometer (https://bildungsmanagement.net/team/prof-dr-stephan-gerhard-huber/)	https://bildungsmanagement.net/team/prof-dr-stephan-gerhard-huber/
Prof. Silvia Stringhini	PI of the SEROCov-KIDS study silvia.stringhini@hcuge.ch Unit of Population Epidemiology, Division of Primary Care Medicine, Geneva University Hospitals, Geneva, Switzerland	https://www.hug.ch/medecine-premier-recours/uep
Susi Kriemler & team		https://www.ebpi.uzh.ch/en/aboutus/departments/epidemiologie/cde/groupeleaderscde/kriemler.html
Association ciao.ch	Marjory Winkler	www.ciao.ch
Association Stop Suicide	https://stopsuicide.ch/	https://stopsuicide.ch/

La main tendue	https://www.143.ch/fr/	https://www.143.ch/fr/
Pro Juventute	https://www.projuventute.ch/fr Marco Mettler	https://www.projuventute.ch/fr
BAG	Damiano Costantini Il a géré la coordination des besoins/problèmes au niveau des jeunes. Il a récolté de nombreuses données dans diverses organisations afin de pouvoir nous aider au mieux. Il a donc une excellente vue d'ensemble des problèmes rencontrés.	https://www.bildungundgesundheit.ch/
SAJV - CSAJ	Nous avons fait un petit sondage auprès de nos membres au sujet de l'impact du certificat covid dans la participation des jeunes aux activités de leurs organisations. Je pourrais mettre les résultats à disposition. isabelle.quinche@sajv.ch	https://www.sajv.ch/de/
Prof. Lilly Shanahan, z-proso study	z-proso study https://www.jacobscenter.uzh.ch/en/research/risk_and_resilience.html https://www.jacobscenter.uzh.ch/en/research/zproso/aboutus/publication_list.html	https://www.jacobscenter.uzh.ch/en/research/risk_and_resilience/people/shanahan_1.html
Dr. Annekatrin Steinhoff	z-proso study	https://www.jacobscenter.uzh.ch/en/research/risk_and_resilience/people/steinhoff_a.html
Research group on children and adolescent health at Unisanté	Responsable : SURIS GRANELL Joan Carles Domaine de recherche : Epidémiologie, Santé des adolescents, Maladies chroniques, Addictions, Santé sexuelle et reproductive	https://www.unisanté.ch/fr/formation-recherche/recherche/groupe-recherche/sante-enfants-adolescents-grsa

Projects	Links	Infos
Covid-19 Social Monitor	https://covid19.ctu.unibe.ch/	Prospective Cohort Study of adults (including young adults 18+) covering amongst others mental health and physical activity. See https://covid19.ctu.unibe.ch/ for details and interactive analyses. There are some proxy-questions for parents about child health taken from the Swiss Health Survey - not yet analyzed. For questions: marc.hoeglinger@zhaw.ch
HEalth in Students during the Corona pandemic (HES-C)	https://www.zhaw.ch/en/health/health-research-and-development/public-health-research/projects-public-health/students-health-in-times-of-the-corona-pandemic/	
SEROCOV-KIDS cohort study	https://recherche.hug.ch/etudes/etude-serocov-kids	
Swiss Corona Stress Study	https://www.unibas.ch/de/Aktuell/News/Uni-Research/Psychische-Belastung-und-Stressfaktoren-bei-Geimpften-und-Ungeimpften.html	
COSMO: Studio sulla salute mentale di adolescenti e giovani adulti durante la pandemia	https://www.supsi.ch/deass/ricerca/banca-dati-progetti/dettaglio.6342.backLink.73d66d97-47a1-4cb9-8df6-d4b5851d9aad.html	
z-proso COVID-19 supplementary assessments	https://www.jacobscenter.uzh.ch/en/research/zproso.html	(4 wave longitudinal study including young adults [age 22] in the frame of an ongoing longitudinal study that started in 2004)



Title	Authors	Link / Doi	Study design	Publication date
Non-compliance with COVID-19-related public health measures among young adults in Switzerland: Insights from a longitudinal cohort study	Amy Nivette; Denis Ribeaud; Aja Murray; Annekatriin Steinhoff; Laura Bechtiger; Urs Hepp; Lilly Shanahan; Manuel Eisner	https://doi.org/10.1016/j.socscimed.2020.113370	Longitudinal	Jan 21
Severe effects of the COVID-19 confinement on young children's sleep: A longitudinal study identifying risk and protective factors	Andjela Markovic, Christophe Mühlematter, Matthieu Beaugrand, Valérie Camos, Salome Kurth	https://doi.org/10.1111/jsr.13314	Longitudinal	Feb 21
Self-Injury and Domestic Violence in Young Adults During the COVID-19 Pandemic: Trajectories, Precursors, and Correlates	Annekatriin Steinhoff, Laura Bechtiger, Denis Ribeaud, Aja Louise Murray, Urs Hepp, Manuel Eisner, Lilly Shanahan	https://doi.org/10.1111/jora.12659	Longitudinal	July 21
The impact of screen time and green time on mental health in children and adolescents during the COVID-19 pandemic	Anne-Linda Camerini, Emiliano Albanese, Laura Marciano, Corona Immunitas Research Group	https://doi.org/10.1016/j.chbr.2022.100204	Longitudinal	Aug 22
Lifestyle behaviours of children and adolescents during the first two waves of the COVID-19 pandemic in Switzerland and their relation to well-being: a population-based study	Gabriela P. Peralta, Anne-Linda Camerini, Sarah R. Haile, Christian R. Kahlert, Elsa Lörthe, Laura Marciano, Andres Nussbaumer, Thomas Radtke, Agne Ulyte, Milo A. Puhani, Susi Kriemler	https://doi.org/10.1101/2021.11.29.21267019	Longitudinal	Dec 2021
Emotional distress in young adults during the COVID-19 pandemic: evidence of risk and resilience from a longitudinal cohort study	Lilly Shanahan, Annekatriin Steinhoff, Laura Bechtiger, Aja L. Murray, Amy Nivette, Urs Hepp, Denis Ribeaud and Manuel Eisner	https://doi.org/10.1017/S003329172000241X	Longitudinal	June 20
COVID-19: Physical Activity and Quality of Life in a Sample of Swiss School Children during and after the First Stay-at-Home	Valentin Benzing, Patrice Gaillard, David Scheidegger, Alain Dössegger, Claudio R Nigg, Mirko Schmidt	https://www.mdpi.com/1660-4601/19/4/2231	Longitudinal	Feb 22
Impact of the COVID-19 pandemic on children with and without risk for neurodevelopmental impairments	Melanie Ehrler, Isabelle Werninger, Barbara Schneider, Dominique A. Eichelberger, Nadja Naef, Vera Disselhoff, Oliver Kretschmar, Cornelia F. Hagmann, Beatrice Latal, Flavia M. Wehrle	https://doi.org/10.1111/apa.15775	Combination of longitudinal and cross-sectional design	Jan 21
COVID-19 pandemic and health related quality of life in primary school children in Switzerland: a repeated cross-sectional study	Bettina Bringolf-Isler, Johanna Hänggi, Bengt Kayser, L. Suzanne Suggs, Alain Dössegger, Nicole Probst-Hensch, and the SOPHYA-Study Group	https://doi.org/10.4414/smww.2021.w3007.1	Cross-sectional	Nov 21
COVID-19: le bien-être des étudiants de l'Université de Fribourg fortement impacté durant la première vague épidémique	Emna El May, Stefano Tancredi, Amaud Chiolero, Stéphane Cullati	https://projects.unifr.ch/pophealthlab/wp-content/uploads/2021/05/2021-PopHealthLab-news-COVID-student.pdf	Cross-sectional	May 2021
Association Between Homeschooling and Adolescent Sleep Duration and Health During COVID-19 Pandemic High School Closures	Joëlle N. Albrecht, Helene Werner, Noa Rieger, Natacha Widmer, Daniel Janisch, Reto Huber, Oskar G. Jenni	https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2787630	Cross-sectional	Jan 22
Body mass index in young men in Switzerland after the national shutdowns during the COVID-19 pandemic—Results from a cross-sectional monitoring study at population level since 2010	Samuel Meili, Marek Brabec, Frank Rühli, Thomas W. Buehrer, Nejla Gültekin, Zeno Stanga, Nicole Bender, Kaspar Staub, Emilie Reber	https://osf.io/qd9vw/	Cross-sectional	Preprint
Age-related effects of the COVID-19 pandemic on mental health of children and adolescents	Stefanie J. Schmidt, Lara P. Barblan, Irina Lory & Markus A. Landolt	https://www.tandfonline.com/doi/pdf/10.1080/2008198.2021.1901407	Cross-sectional	Mar 2021
COVID-19-Related School Disruptions and Well-Being of Children and Adolescents in Geneva	Viviane Richard, Roxane Dumont, Elsa Lörthe, Héléne Baysson, Maria-Eugenia Zaballa, Rémy P. Barbe, Klara M. Posfay-Barbe, Idris Guessous, Silvia Stringhini, Specchio-COVID19 Group	https://doi.org/10.1111/jpc.15973	Cross-sectional	Apr 22



Health-Related Quality of Life and psychological distress of adolescents during the COVID-19 pandemic in Geneva	Roxane Dumont, Viviane Richard, H�el�ene Baysson, Elsa Lorthe, Giovanni Piumatti, Stephanie Schrempft, Ania Wisniak, R�emy P. Barbe, Klara M. Posfay-Barbe, Idris Guessous, Silvia Stringhini on behalf of the Specchio-COVID19 study group	https://doi.org/10.1101/2021.09.20.21263812	Cross-sectional	Sep 21
«Pas au top � cause du Corona?» - Sondage aupr�es des jeunes romand-es �g�es de 10 � 25 ans	Vanessa Prince, Yara Barrense-Dias	https://doi.org/10.16908/rds-essentiels/30	Cross-sectional	June 21
Persistent symptoms among children and adolescents with and without anti-SARS-CoV-2 antibodies: a population-based serological study in Geneva, Switzerland	Roxane Dumont, Mayssam Nehme, Elsa Lorthe, Carlos de Mestral, Viviane Richard, H�el�ene Baysson, Francesco Pennacchio, Julien Lamour, Claire Semaani, Maria-Eugenia Zaballa, Nick Pullen, Anne Perrin, Arnaud G. L'Huillier, Klara M. Posfay-Barbe, Idris Guessous, Silvia Stringhini on behalf of the Specchio-COVID19 study group	https://doi.org/10.1101/2021.12.23.21268298	Cross-sectional	Dec 2021
Sleep and Health-Related Characteristics among Adolescents during COVID-19: An Update	Jo�lle N. Albrecht, Helene Werner, Noa Rieger, Oskar G. Jenni, and Reto Huber	https://mdpi-res.com/d_attachment/ijerph/ijerph-19-05078/article_deploy/ijerph-19-05078-v2.pdf?version=1650616089	Repeated cross-sectional	Apr 22
Impact de la pand�mie de Covid-19 sur les troubles psychiques des adolescents et jeunes adultes	Manuel Tettamanti, C�dric Devill�, Carole Kapp, Marco Armando, Logos Curtis	https://padlet-uploads.storage.googleapis.com/1727438954/3d709a67e6258ec7ea3d27f6c530f8d3/Tettamanti_RSM_2021.pdf	Brief literature review	Sep 21
Grey Literature				
Psychische Gesundheit Kennzahlen mit Fokus Covid-19	Daniela Schuler, Alexandre Tuch, Isabelle Sturny, Claudio Peter Jo�lle N. Albrecht, Helene Werner, Noa Rieger, Oskar G. Jenni, and Reto Huber; Schweizerisches Gesundheitsobservatorium (Obsan)	https://www.obsan.admin.ch/de/publikationen/2022-psychische-gesundheit	Grey Literature	Apr 22
Swiss Corona Stress Study: November 2021	Dominique de Quervain; Amanda Aerni, Ehssan Amini, Doroth�e Bentz, David Coynel, Christiane Gerhards, Virginie Freytag, Andreas Papassotiropoulos, Nathalie Schick Tanz, Thomas Schlitt, Anja Zimmer, Priska Zuber	https://osf.io/x6zu7/	Grey Literature	Dec 2021
COVID-19: le bien-�tre des �tudiants de l'Universit� de Fribourg fortement impact� durant la premi�re vague �pid�mique	Emna El May, Stefano Tancredi, Arnaud Chiolero, St�phane Cullati	https://projects.unifr.ch/pophealthlab/wp-content/uploads/2021/05/2021-PopHealthLab-news-COVID-student.pdf	Grey Literature	May 2021
«Pas au top � cause du Corona?» - Sondage aupr�es des jeunes romand-es �g�es de 10 � 25 ans	Vanessa Prince, Yara Barrense-Dias	https://doi.org/10.16908/rds-essentiels/30	Grey Literature	June 21

Der Anteil der übergewichtigen Schulkinder bleibt vorerst trotz Corona stabil	Gesundheitsförderung Schweiz	https://gesundheitsfoerderung.ch/ueber-uns/medien/medienmitteilungen/artikel/der-anteil-der-uebergewichtigen-schulkinder-bleibt-vorerst-trotz-corona-stabil.html	Grey Literature	Mai 22
On My Mind. How adolescents experience and perceive mental health around the world. A companion report to The State of the World's Children 2021	Johns Hopkins Bloomberg School of Public Health and United Nations Children's Fund (UNICEF)	https://www.unicef.org/media/119751/file	Grey Literature	May 2022
Pro Juventute Corona Report. Update November 2021	Pro Juventute	https://www.projuventute.ch/de/update-corona-report	Grey Literature	Nov 21
Appell Kinder- und Jugendorganisationen	Pro Juventute	https://www.projuventute.ch/de/ugend-appell	Grey Literature	
Pro Juventute Corona Report. Auswirkungen der Covid-19-Pandemie auf Kinder, Jugendliche und ihre Familien in der Schweiz	Pro Juventute	https://www.projuventute.ch/de/corona-report	Grey Literature	Feb 21
The State of the World's Children 2021. On My Mind: Promoting, protecting and caring for children's mental health	UNICEF	https://www.unicef.org/reports/state-worlds-children-2021	Grey Literature	Oct 2021
Psychische Gesundheit von Jugendlichen Studie zur Situation in der Schweiz und Liechtenstein	UNICEF Schweiz und Liechtenstein	https://www.unicef.ch/de/unsere-arbeit/schweiz-liechtenstein/psychische-gesundheit	Grey Literature	2021
z-proso: Junge Menschen in der Corona Krise	Universität Zürich, Jacobs Center	https://www.jacobscenter.uzh.ch/dam/jcr:172f5bd9-7423-4c59-bdd8-7277d77ee1fc/2020-zproso-news-COVID.pdf	Grey Literature	Aug 20

Publications/Projects in planning	Authors	Infos
Post-COVID syndrome in children and adolescents: prevalence and risk factors from a population-based serological study	Roxane Dumont, Viviane Richard, Elsa Lorthe, Andrea Loizeau, Francesco Pennacchio, Maria-Eugenia Zaballa, Hélène Baysson, Mayssam Nehme, Anne Perrin, Arnaud G. L'Huilier, Rémy P. Barbe, Klara M. Posfay-Barbe, Silvia Stringhini, Idris Guessous	
Suicidal ideation in adolescents during the COVID-19	Roxane Dumont et al.	
Impact of the COVID-19 pandemic on children's and adolescents' quality of life and mental health	Viviane Richard, Roxane Dumont, Elsa Lorthe, Andrea Loizeau, Maria-Eugenia Zaballa, Francesco Pennacchio, Hélène Baysson, Rémy P. Barbe, Klara M. Posfay-Barbe, Idris Guessous, Silvia Stringhini	
Mental sequelae of the COVID-19 pandemic in children with and without complex medical histories and their parents: well-being prior to the outbreak and at four time-points throughout 2020 and 2021	Melanie Ehler, Cornelia F. Hagmann, Oliver Kretschmar, Markus A. Landolt, Beatrice Latal, Flavia M. Wehrle	The article is accepted and soon to be published. This is a pre-print published in medrxiv. The accepted article includes an additional measurement time point in November 2021. https://www.medrxiv.org/content/10.1101/2021.12.05.21267236v1
SOPHYA2-Bericht	Bettina Bringolf-Isler et al.	SOPHYA2 report to be published Sept. 7, 2022 (including a focus on the impact of COVID-19 on children's physical activity and dietary behaviors and quality of life)
several publications currently under review (Early adolescent predictors of young adults' coping during COVID-19 pandemic [Steinhoff et al.], Trends of substance use and other addictive behaviours among young adults in Zurich during the COVID-19 pandemic [Leos-Toro et al.], Risk and Resilience [Shanahan et al.]	Prof. Shanahan's group and z-proso	