Statement from DGKH, DGPI, DAKJ, GHUP and BVKJ: Schools and daycare centers should be reopened (as of May 20, 2020)

Statement from the German Society for Hospital Hygiene (DGKH), the German Society for Pediatric Infectious Diseases (DGPI), the German Academy for Pediatric and Adolescent Medicine (DAKJ), the Society for Hygiene, Environmental Medicine and Preventive Medicine (GHUP) and the professional association of children and Adolescent Doctors in Germany eV (BVKJ)

Children and adolescents in the COVID-19 pandemic: schools and daycare centers are to be reopened. The protection of teachers, educators, carers and parents and the general hygiene rules do not stand in the way of this

Stand 20.5.2020

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The undersigned professional associations consider the following consequences to be possible against the background of the current data situation :

- Daycare centers, kindergartens and primary schools should be reopened promptly - taking into account the regional new infection rate and the existing capacities. This is on the part of the children without massive restrictions. B. Small group formation and barrier protection measures such as maintaining distance and wearing a mask would be possible. More decisive than the individual group size is the question of the lasting constancy of the respective group and avoidance of mix-ups.
- Children can be taught in a playful and child-friendly way in **basic hygiene rules such as hand washing and mindful hygiene behavior** in dealing with each other, eating and in the sanitary facilities. This and the necessary equipping of all school toilets and hand washing areas with soap dispensers and paper towels would, according to the current state of knowledge, have long-term positive effects on the spread of many other contagious pathogens in such facilities.
- Regardless of the preventive measures implemented in children and adolescents, the protection of the teaching, educational and support staff is crucial (keeping their distance from one another, mouth and nose protection, situation-dependent options for hand disinfection, possibly supported by regular pool testing).
- If adults with a significantly increased risk of a complicated course of SARS-CoV-2 infection live in the same household, individual and creative solutions should be sought on their own responsibility and in close consultation, which still allow the children to visit community facilities. Appropriate educational and public relations work is required.
- A reduction in contact by regulating group sizes, avoiding

recommendations for the private and extracurricular areas.

- Children over 10 years of age and young people up to graduation can be more actively involved in specific hygiene rules. Here, maintaining a large distance (1.5 m), wearing a mouth and nose cover (as long as the students are not sitting in their assigned seat) and consistent education in the basic rules of infection prevention allow greater leeway for normalization of the classroom.
- *In contrast to retirement homes, community facilities for children and young people do not represent a high-risk environment per se* and, after individual medical considerations, can also be visited by children and young people with certain underlying illnesses.
- Children and adolescents with a SARS-CoV-2 infection should be examined immediately to confirm or rule out such an infection. Detection of individual infections in children or schoolchildren must not automatically lead to the entire daycare center or school being closed again. A detailed analysis of the infection chain is a prerequisite for a balanced infection management.
- The opening of schools and children's facilities should be accompanied by structured scientific surveillance examinations, which clarify further questions about infectious events and hygiene management. These prospective and accompanying examinations are essential in order to evaluate and verify the effectiveness of the hygiene measures already required.

The recommendation published here is based on the current state of knowledge and the interpretation of the participating professional associations as of **May 19, 2020** *. It is part of the basic understanding, but it should be emphasized once again that the increase in knowledge in the coming weeks and months may lead to a reassessment of the situation, which will then result in a corresponding readjustment of this recommendation.*

CoV-2 infection in children are low

Current data suggest a lower rate of symptomatic infections in childre cents than in adults. The majority of children and adolescents with SARS-CoV-2 infection show either no symptoms or only mild symptoms (CDC COVID-19 RESPONSE TEAM, 2020; CHIDINI et al., 2020; FRENTHEIM, STOLTENBERG, 2020). Serious courses rarely occur (DONG et al., 2020). Severe cases of illness affect half of all cases (but not exclusively) children with underlying diseases or treatment-related impairment of the immune system (ARMANN et al., 2020). Admission to hospital is not always a marker for the severity of the disease. In Parri et al. (Coronavirus Infection in Pediatric Emergency Departments Study, 17 emergency clinics in Italy) 38 out of 100 children were admitted to the hospital,

Of the children treated in inpatients in the registry of the German Society for Pediatric Infectious Diseases (DGPI) (as of **May 18** , **2020** ; n = 138), 24% of the children in the normal ward had a relevant underlying disease, and 56% of the children in the intensive care ward (15% of all inpatients treated children; n = 20).

Deaths in children and adolescents are extremely rare (until May 18, 2020 in the DGPI Register of inpatient children a death associated with COVID-19). In other countries, too, there are so far only a few individual cases (see below on the possibly SARS-CoV-2-associated multisystemic hyperinflammation syndrome).

A pre-existing, significantly increased susceptibility to severe respiratory infections [e.g. B. by influenza or other respiratory viruses such as respiratory syncytial virus (RSV), human metapneumovirus (hMPV), other human pathogenic coronaviruses] is known to the parents and the treating physicians[1] regardless of the current COVID-19 pandemic.

The extent to which certain anamnestic information and underlying diseases increase the risk of a complicated course in childhood infections with SARS-CoV-2 is not conclusively known. As an example, pediatric oncologists from the MSK Kids Pediatric Program

oncological patients who tested positive in the midst of the outbreak there (BOOLAB et al., 2020). This confirms the very early results of an international survey published on April 20, 2020 (HRUSAK et al., 2020). In a current report from Pediatric Oncology in Padua (Italy, COVID-19 high prevalence region), not a single SARS-CoV-2 case was found in over 500 individual tests (patients and accompanying persons) (SAINATI, BIFFI, 2020).

The proportion of children in the age group up to 10 years of all patients who tested positive is 1 to 2% and reaches a maximum of 6% up to the age of 20 years. In Germany, the proportion of children <10 years was 1.9% and between 10 and 19 years it was 4.3%. According to the RKI management report of May 17, 2020 , there were a total of 174,355 infections, of which 3,295 were children under 10 years and 7,524 children and adolescents between 10 and 19 years of age; including only 3 deaths between 3 and 18 years of age, each with previous illnesses.

The share of children and adolescents up to the age of 20 in Norway was 4% on March 22nd. Due to the high proportion of asymptomatic children with SARS-CoV-2 infection, it can be assumed that this is an under-reporting. **How high the actual infection rate is cannot be answered unequivocally. The available results of seroepidemiological studies are currently not sufficient to record the real prevalence of infections among children and adolescents**. The fact that even less symptomatic children excrete the virus in nasopharyngeal secretions in the same concentration as symptomatic adults is not surprising for pediatricians (JONES et al., 2020a; L'HUILLIER et al., 2020). To deduce from this a higher risk of transmission from children to other people (especially to adults) (JONES et al., 2020a) contradicts the observation that most of the confirmed SARS-CoV-2 evidence in children has an adult contact person (e.g. a parent) Source of infection was. It is more relevant that children obviously do not have increased virus concentrations in the upper respiratory tract compared to adults (JONES et al., 2020a; L'HUILLIER et al., 2020).

appears to be low - closings of schools and day-care centers are likely to have little effect on the further spread of the infection

Numerous findings speak against an increased risk of infection from children. Various studies, reviews, outbreak and cluster analyzes, modeling in connection with the evaluations of previous influenza pandemics (see below) as well as the published evaluations of the previous coronavirus pandemics MERS and SARS-1 give an increasingly conclusive picture that children in the current COVID -19 Pandemic, in contrast to the role in influenza transmission, does not play a prominent role in the spread of the disease.

Infection is usually transmitted to children within families by infected adults (GHINAI et al., 2020), while evidence of transmission to several adults by one infected child has so far been lacking. These transference situations will also exist, but they seem to be of less relevance. The importance of school and daycare closings on the dynamics of the further spread of infection is estimated to be minor (FERGUSON, 2020; VINER et al., 2020). Key data used to support the role of children in pandemic dynamics was obtained from studies of pandemic influenza. Comparable data from coronavirus pandemics do not exist, but rather show the lesser importance of the spread through children.

- **WHO-China-Joint-Mission-Report**
  The report summarizes data on the risk of infection for children <18 years in China: There is a low infection rate in China (share of children 2.4% of all confirmed infections). In Wuhan, subsequent tests of secretions from respiratory ill children with ILI (influenza like illnes) did not reveal any SARS-CoV-2 evidence in November, December 2019 up to and including January 15, 2020. Intensive contact tracing was used in approx COVID-19 contact persons detected. Infected children were largely found in households with infected adults. The infection rate of children in households was between 3 and 10%. The Joint Mission Team found no evidence of transmission from infected children to adults (WHO-CHINA-JOINT-MISSION-ON

The current DGPI survey, in which children treated in hospital are recorded, shows that 81% of children with a reconstructable chain of infection were infected via their parents (ARMANN et al., 2020). The DGPI register covers the period March 18, 2020 - 18.05.2020 only 138 inpatient admissions of children throughout Germany with SARS-CoV-2 proof (these are children, 87% of whom have already been discharged, 75% of whom are cured and 25% of whom have slight residual symptoms) . Even in the children's clinics in the middle of so-called hotspots with many ventilated adult patients, according to the South German Society for Pediatric and Adolescent Medicine, there were only a few patients, specifically e.g. Rosenheim (focal point LK Rosenheim): 1 child with SARS-CoV-2 infection, Passau (Focal point LK Rottal-Inn):

- **France:**
  An analysis describes a hyperspreader event in the French Alps, in which 11 of 16 guests in a hotel were infected with SARS-CoV-2 by an asymptomatic SARS-CoV-2-positive tourist (index patient) (12/16 = 75% Infection rate). Among them was a 9-year-old child with mild symptoms of a respiratory infection and co-infection with influenza and picorna viruses. It attended 3 schools plus one ski school for 1 week. 172 contacts, including 73 with virus smears, are tracked, of which 112 school contacts of the child (84 with moderate and 88 with low risk of transmission, based on the intensity of the contact). 70 contact persons had respiratory symptoms, in 46 other respiratory viruses were found (33% influenza, 18% picorna viruses, 16% classic coronaviruses). Not a single SARS-CoV-2 infection was found among the child's contacts. The authors conclude:„*The fact that an infected child did not transmit the disease despite close interactions within schools suggests potential different transmission dynamics in children*“ (DANIS et al., 2020). In a major outbreak at a French high school in the early phase of the epidemic in France, serological tests for SARS-CoV-2 were carried out around 8 weeks after the infection began to spread: 40 percent of 15-17 year olds and 43 percent of teachers

parents and 10.2% for siblings (FONTANET et al., 2020). Salje et al. assume that by May 11, 2020 4.4% (2.8 - 7.2%) of the French population were infected with SARS-CoV-2, which would correspond to a total of 2.8 million people (1.8- 4.7; calculated hospitalization rate across all age groups 3.6%, mortality 0.7%, for those under 20 years of age 0.001%) (SALJE et al., 2020).

- In an analysis by scientists from Switzerland on the current effects of non-pharmaceutical interventions (NPIs) on the number of infections in 20 countries (USA, EU-15, Norway, Switzerland, Canada and Australia) (BANHOLZERA et al., 2020) shows that school closings with 11% have the second-lowest effect on the spread of infection. In the opinion of the authors, this finding is consistent with the previous literature, in which the transmission of SARS-CoV-2 by children is considered to be comparatively low. In this analysis, the closing of event venues (33%) and shops with non-critical infrastructure (28%) had a higher effect. The additional general contact lock has the lowest effect (BANHOLZERA et al., 2020).
- **Great Britain:**
  A systematic review of school closings in previous pandemics published on April 6 (VINER et al., 2020) assessed the results of 16 studies examining the effects of school closings on the coronavirus pandemic. During the 2003 SARS-1 outbreaks in China, Hong Kong and Singapore, school closings showed limited benefit in slowing the spread of the virus. The authors point to various collateral damage (loss of essential labor due to childcare requirements, restrictions on learning, sociability and physical activity of students, significant psychosocial risks for the most vulnerable children, including those from low-income families). Since there is no solid data on the current effects of the COVID-19 pandemic, the authors intensively evaluate the findings from influenza pandemics. They come to the conclusion that the effect of school closings on the COVID-19 pandemic is likely to be rather small in contrast to influenza pandemics. Interactions with other factors (e.g. when the school closes, parents who work from home, additional social mixing e.g. close contact with people at risk in the family

these results as a dilemma for politicians, because the decisions to close schools and day-care centers are made without reliable evidence of effectiveness. In another model analysis by the Imperial College COVID-19 Response Team London on non-pharmaceutical interventions (NPIs), the authors assume that school closings only have an effect if children are assumed to play a significant role in the transmission dynamics. In the model calculation, a very small effect of school closings on the mortality rate is postulated (FERGUSON, 2020).

A relevant role of school closings on the spread dynamics is negated for the current COVID-19 pandemic. This is seen as a crucial difference to the role in influenza pandemics. The longer the school closes, the greater the considerable collateral damage that this causes must be taken into account (GERMAN ACADEMY FOR KINDER- UND JUGENDMEDIZIN EV, 2020; MUNRO, FAUST, 2020; SCHOBER et al., 2020; THE LANCET CHILD ADOLESCENT, 2020)

- **Norway:**
  In a systematic literature analysis commissioned by the Norwegian Institute of Public Health's (NIPH's), the authors summarize the results as follows: Children seem to be less susceptible to symptomatic infection with SARS-CoV-2 than adults. The authors evaluate the current literature, particularly on cluster analyzes of family transmissions from China, and come to the conclusion that, on the basis of the current data, children do not play an essential role as vectors of virus transmission. However, it is too early to give a final judgment (as of March 2020). Regarding the question of the effectiveness of school and daycare closings, the authors emphasize the lack of data on coronavirus epidemics and explain that the experiences and evaluations relate almost exclusively to influenza epidemics„*We have not found any research reports that have calculated the effects of school/kindergarten closures during the COVID-19 epidemic. There are a number of systematic reviews on this issue, but they are mostly based only on studies done in connection with influenza epidemics. It is highly uncertain how relevant the*

play a small role in the transmission of the SARS-CoV-2, as opposed to what is the case with the influenza virus (FRENTHEIM, STOLTENBERG, 2020)

- **Netherlands:** In the Netherlands, all municipal health services (GGDs) carry out an intensive analysis of the chains of infection with contact tracing. According to this, no patients under the age of 18 were found who had infected other people. Around 40 doctors in private practice in the Netherlands register the number of patients who visit the practice with flu-like symptoms. Overall, 6.5% of them turned out to be SARS-CoV-2 infected. No SARS-CoV-2 infection was found in the tested patients under 20 years of age. As part of a long-term seroepidemiological study (PIENTER Corona study), 2,096 people were examined by April 17. The first results show that 3.6% of these people have SARS-CoV-2 antibodies in their blood, of which 2% in people under the age of 20 and 4.2% in adults.
- In a **report by the National Center for Immunization Research and Surveillance** (NCIRS, Australia, April 26, 2020) on the tracking of SARS-CoV-2 infections in students (n = 9) and teachers (n = 9) from 15 schools in New South In Wales (10 secondary and 5 primary schools), the subsequent transfer to classmates (n = 735) and staff (n = 128) was examined. The index patients had normal contact within everyday school life. In the primary schools 137 pupils and 31 employees were classified as "close contacts"[2], in the secondary schools this was 598 pupils and 97 employees. A subsequent SARS-CoV-2 infection was not detected in any of the employees examined (teachers, supervisors, etc.) (30% were tested).
  Only two other children (a primary school child and a secondary school teenager) may have contracted one of the index patients (NATIONAL CENTER FOR IMMUNIZATION RESEARCH AND SURVEILLANCE (NCIRS), 2020).
- **Virus concentrations in the throat and suspected infectivity:** In a quantitative analysis of the viral load of COVID-19 patients, no significant age-dependent differences were found. The authors conclude from the nasopharyngeal virus detection from tests with clinical indication :... "*In particular, these data*

*have to caution against an unlimited re-opening of schools and kindergartens in the present situation. Children may be as infectious as adults ".*Regardless of the selection made through an examination of predominantly symptomatic children and the small number of cases, the admissibility of the quantitative viral load in the upper respiratory tract can be used to infer the actual risk of transmission. It also appears unusual that, despite the obvious need for discussion, in view of the controversial epidemiological data and comparisons with analyzes of previous coronavirus and influenza pandemics, the warning of an "unlimited" reopening of kindergartens and schools is already highlighted in the introductory short abstract (JONES et al ., 2020a). Interestingly, L'Huillier et al. (Geneva) with regard to the quantitative virus detection in a total of 23 symptomatic newborns,

- **Island:** 6% of the Icelandic population were tested in a study up to the beginning of April (GUDBJARTSSON et al., 2020). 3 groups were examined: 9,199 people with high risk (presence of symptoms, positive travel history after a skiing holiday in Austria / Northern Italy or risk contacts) from January 31: total infection rate 13.3%, children <10 years 6.7%. 10,797 people after an open invitation to the test (population sample) from March 13: total infection rate 0.8%, children <10 years 0%. 2283 people after specific invitation by April 4 (representative sample as a quality comparison): total infection rate 0.6%. At the beginning of the spread in Iceland, the travel history (return from ski areas in Austria and Northern Italy) was the main risk, later, a travel history (return from Great Britain) and intra-family transmission dominated (GUDBJARTSSON et al., 2020). Children <10 years play practically no role in the spread dynamics. The data are also confirmed in the further course, during which the test rate increases to> 15% of the total population.
- In a systematic **evaluation of the cases with COVID 19 reported to the RKI during the shutdown**Evidence (from March 16, 2020) was found by Goldstein et al. compared to patients older than 25 years, a relative increase in prevalence in 15-20 year old adolescents (or young adults). The group

deduce from this that the group of 15-25 year olds could possibly play an important role in the spread of the SARS-CoV-2 infection. According to this analysis (during the shutdown), this was definitely not the case for children under 15 years of age (GOLDSTEIN, LIPSITCH, 2020). After intensive mathematical modeling, the same working group came to the conclusion that social distancing measures may be necessary by 2022 (KISSLER et al., 2020). In an editorial from The Lancet Child & Adolescent Health (THE LANCET CHILD ADOLESCENT, 2020) the authors describe the peculiarities of the young age group, in which tendencies of uncertainty, but also of reorientation and rebellion against social norms are part of normal development. This should be taken into account when communicating and reviewing preventive measures.

Multisystemic hyperinflammation syndrome in children after SARS-CoV-2 infection

This very rare, so far only provisionally clinically defined syndrome (CENTERS FOR DISEASE CONTROL AND PREVENTION, 2020; ROYAL COLLEGE OF PAEDIATRICS AND CHILD HEALTH, 2020), temporally associated with the SARS-CoV-2 infection in children, is similar to other hyperinflammation syndromes in childhood (e.g. Kawasaki Syndrome, Macrophage Activation Syndrome). It can begin with severe gastrointestinal symptoms and become life-threatening if the coronary arteries are affected (see Kawasaki) (EUROPEAN CENTER FOR DISEASE PREVENTION AND CONTROL (ECDC), 2020; RIPHAGEN et al., 2020; VERDONI et al., 2020).

The DGPI, together with the German Society for Pediatric Cardiology, published a first statement on this on May 6, 2020 (GERMAN SOCIETY FOR PEDIATRIC INFECTIOLOGY (DGPI), GERMAN SOCIETY FOR PEDIATRIC CARDIOLOGY (DGPK), 2020). The Royal College of Paediatrics and Child Health has also issued initial information on diagnostics and therapy (ROYAL COLLEGE OF PAEDIATRICS AND CHILD HEALTH, 2020). Following such communications carefully is an important task for all doctors

connection with a previous SARS-CoV-2 infection is still unclear (JONES et al., 2020b). Suspected cases should be monitored and treated at an early stage and reported to the health authorities . **The occurrence of such a multisystemic hyperinflammation syndrome is so rare in relation to the total number of children infected with SARS-CoV-2 that it does not change the fundamental conclusions formulated in this statement.**

Conclusions

In the opinion of the undersigned professional associations, the analyzes published to date on the spread of SARS-CoV-2 and the course of COVID-19 show that children play a significantly less important role in the spread of the virus than adults.

This knowledge does not make a carefully carried out and supported by generous test indications and accompanying prospective surveillance when schools and daycare centers are opened.

However, this should fundamentally guide relevant socio-political decisions within the framework of pandemic management. According to the knowledge available to date, children and adolescents are not only less ill than adults, but also generally less severely than adults if they are infected. The vast majority of infections in children and adolescents are asymptomatic or oligosymptomatic. In addition, the first analyzes from China already show that children and adolescents play a subordinate role in the transmission of the virus to other children and adolescents, but also to adults. The risk of transmission in adolescents> 15 years of age may not differ significantly from that in adults,

In particular for children under 10 years of age, the current data speak for both a lower infection rate and a significantly lower infection rate. There is currently insufficient evidence about the cause of this lower virus transmission, which must be clarified in further analyzes.

Since there are isolated indications that even in symptomatic

the lower risk of transmission may be related to the fact that children are less severe cough or the duration of the symptoms is shorter. There is no linear relationship between the viral load detected in the upper respiratory tract and the risk of transmission, since ultimately the amount of virus that has reached the recipient's mucous membranes is decisive for an infection.

The increasing evidence for this data situation has meanwhile also prompted British scientists to call for schools to be opened up to children and adolescents immediately and to include children with pre-existing underlying diseases (MUNRO, FAUST, 2020). British scientists are calling for governments around the world to allow all children to go back to school regardless of comorbidities.

Detailed monitoring will be required to confirm the safety of this approach, even if current analyzes explain the ineffectiveness of school closings in the context of the current COVID-19 pandemic (BANHOLZERA et al., 2020) (Viner, 2020 # 25336). According to the current state of knowledge, severe COVID-19 is by no means more common in children in Germany than many other potentially serious infectious diseases in children that do not lead to the closure of schools and children's facilities.

An individualized risk assessment and decision-making should be carried out by doctors for those affected at exceptional risk, such as: B. for children in the first months after bone marrow or organ transplantation or with severe congenital immunodeficiencies.

If adults with a significantly increased risk of a complicated course of SARS-CoV-2 infection live in the same household, individual and creative solutions should be sought on their own responsibility and in close consultation, which still allow the children to visit community facilities.

As a conclusion from the available data on the non-medical consequences of the closure of community facilities, the infectiology of SARS-CoV-2 and the epidemiological situation in Germany, the **DAKJ** already recommended on April **20, 2020** :
"... the resumption of school attendance ... for all children and young

adolescents, the consequences for this population group were not discussed and those affected and their advocates were not heard, thus disregarding the elementary rights of children (GERMAN ACADEMY FOR KINDER- UND YOUTH MEDICINE EV, 2020; GERMAN SOCIETY FOR PEDIATRIC INFECTIOLOGY, GERMAN ACADEMY FOR CHILD AND YOUTH MEDICINE EV, 2020).

We would like to thank the numerous committed colleagues from the respective specialist societies who have actively participated in the approval of this statement.

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1. All genders are meant for all corresponding terms.
2. Face-to-face contact for 15 minutes or at least 2 hours in the same room.

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