Coronavirus Disease 2019
(COVID-19)
Daily Situation Report of the Robert Koch Institute

21/05/2020 - UPDATED STATUS FOR GERMANY

Confirmed cases	Deaths	Deaths (%)	Recovered
176,752	**8,147**	**4.6%**	**ca. 158,000****
(+ 745*)	(+ 57*)		

*Change from previous day; **Estimate

– Changes since the last report are marked blue in the text –

Summary (as of 21/05/2020, 12:00 AM)

- In total, 176,752 COVID-19 cases and 8,147 deaths due to COVID-19 have been electronically reported to the Robert Koch Institute in Germany.
- The cumulative incidence (cases per 100,000) of COVID-19 is currently highest in Bavaria (351), Baden-Wuerttemberg (309), Hamburg (274) and Saarland (273).
- Most cases (67%) are between 15 and 59 years old. Women (52%) and men (48%) are almost equally affected.
- People aged 70 years or older account for 86% of deaths but only 19% of all cases.
- COVID-19 outbreaks continue to be reported in nursing homes and hospitals.
- In addition, COVID-19 outbreaks among workers of meat processing plants have been reported in several federal states, among others in North Rhine-Westphalia and Bavaria.

Epidemiological Situation in Germany

Geographical distribution of cases

Epidemiological analyses are based on validated cases notified electronically to the Robert Koch Institute (RKI) in line with the Protection Against Infection Law (Data closure: 12:00 AM daily). Since January 2020, a total of 176,752 (+745) laboratory-confirmed cases of coronavirus disease 2019 (COVID-19) have been electronically reported to and validated by the RKI, including 8,147 deaths (see Table 1 and Figure 1). Information on confirmed cases is also available on the RKI website at https://www.rki.de/DE/Content/InfAZ/N/Neuartiges_Coronavirus/Fallzahlen.html and https://corona.rki.de.

Table 1: Number and cumulative incidence (per 100,000 population) of notified laboratory-confirmed COVID-19 cases and deaths for each federal state, Germany (21/05/2020, 12:00 AM).

Federal State	Total Number of cases	Number of new cases	Cases/ 100,000 pop.	Cases in the last 7 days	7-day incidence	Number of deaths	Number of deaths/ 100,000 pop.
Baden-Wuerttemberg	34,175	60	309	389	3.5	1,680	15.2
Bavaria	45,929	163	351	798	6.1	2,348	18.0
Berlin	6,555	48	175	173	4.6	186	5.0
Brandenburg	3,205	12	128	41	1.6	151	6.0
Bremen	1,273	17	186	120	17.6	39	5.7
Hamburg	5,053	11	274	36	2.0	239	13.0
Hesse	9,574	91	153	388	6.2	451	7.2
Mecklenburg-Western Pomerania	762	7	47	23	1.4	20	1.2
Lower Saxony	11,362	74	142	257	3.2	566	7.1
North Rhine-Westphalia	36,912	146	206	1,112	6.2	1,546	8.6
Rhineland-Palatinate	6,555	26	160	147	3.6	224	5.5
Saarland	2,706	3	273	27	2.7	157	15.9
Saxony	5,185	35	127	132	3.2	201	4.9
Saxony-Anhalt	1,689	9	76	26	1.2	54	2.4
Schleswig-Holstein	3,021	7	104	34	1.2	134	4.6
Thuringia	2,796	36	130	127	5.9	151	7.0
Total	**176,752**	**745**	**213**	**3,830**	**4.6**	**8,147**	**9.8**

Note: The report is a snapshot and is continuously updated.

State	(n)	/100,000
Baden-Wuerttemberg	34,175	308.7
Bavaria	45,929	351.2
Berlin	6,555	174.9
Brandenburg	3,205	127.6
Bremen	1,273	186.4
Hamburg	5,053	274.4
Hesse	9,574	152.8
Mecklenburg-Vorpommern	762	47.3
Lower Saxony	11,362	142.3
North Rhine-Westphalia	36,912	205.8
Rhineland-Palatinate	6,555	160.5
Saarland	2,706	273.2
Saxony	5,185	127.1
Saxony-Anhalt	1,689	76.5
Schleswig-Holstein	3,021	104.3
Thuringia	2,796	130.5
Summe	**176,752**	

Figure 1: Number and cumulative incidence (per 100,000 population) of the 176,752 electronically reported COVID-19 cases in Germany by county and federal state (21/05/2020, 12:00 AM). Please see the COVID-19 dashboard (https://corona.rki.de/) for information on number of COVID-19 cases by county (local health authority).

Distribution of cases over time

The first COVID-19 cases in Germany were notified in January 2020. Figure 2 shows COVID-19 cases transmitted to RKI according to date of illness onset from 01.03.2020 onwards. With regard to all reported cases, the onset of symptoms is unknown in 55,275 cases (31%). When the the onset of symptoms is unknown, the date of reporting is provided in the figure.
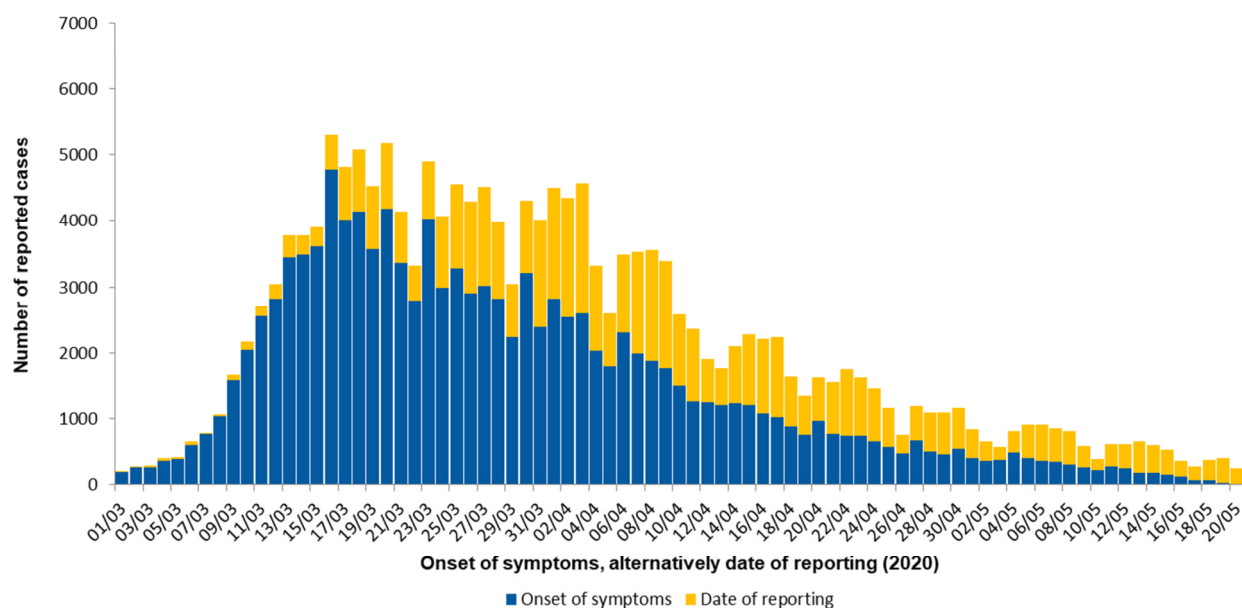

Figure 2: Number of electronically reported COVID-19 cases in Germany by date of symptom onset and by date of reporting from 01/03/2020 (21/05/2020, 12:00 AM).

Note: The report is a snapshot and is continuously updated.

Demographic distribution of cases

Of all reported cases, 52% are female and 48% are male. Among notified cases, 3,447 were children under 10 years of age (2.0%), 7,731 children and teenagers aged 10 to 19 years (4.4%), 76,218 persons aged 20 to 49 years (43%), 55,536 persons aged 50 to 69 years (31%), 28,641 persons aged 70 to 89 years (16%) and 5.059 persons aged 90 years and older (2.9%). The age is unknown in 120 notified cases. The mean age of cases is 49 years (median age 50 years). The highest incidences are seen in persons aged 90 years and older (
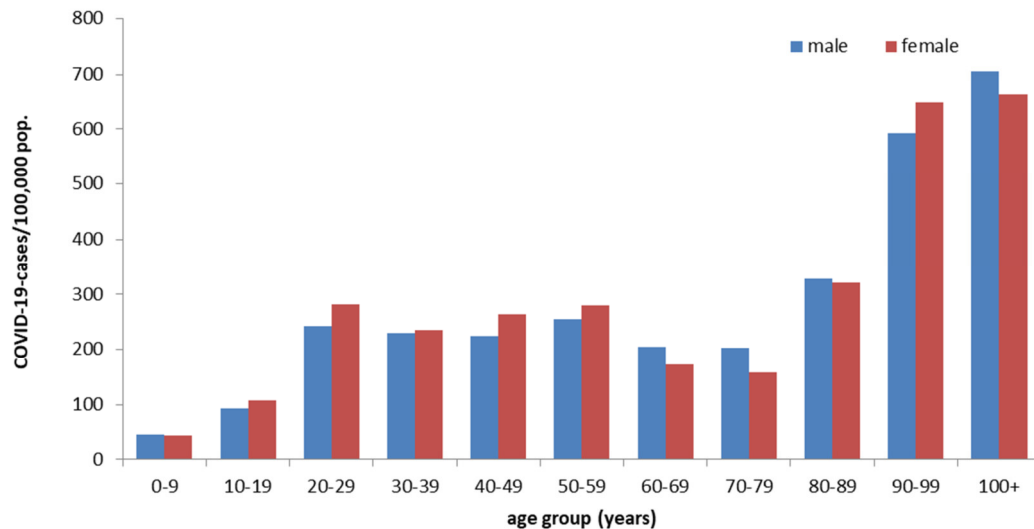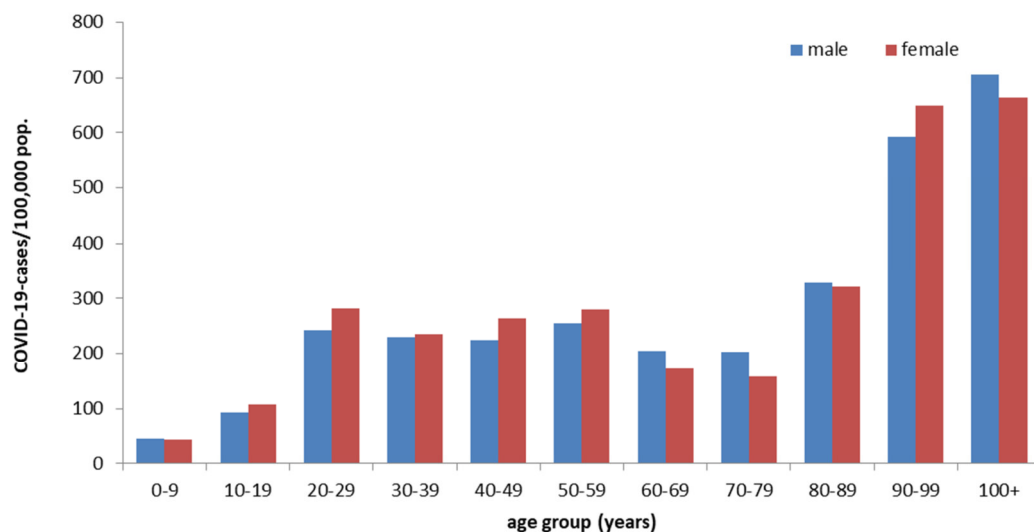

Figure 3).

Figure 3: Electronically reported COVID-19 cases/100,000 population in Germany by age group and gender (n=176,288) for cases with information available (21/05/2020, 12:00 AM).

Clinical aspects

Information on symptoms is available for 148,232 (84%) of the notified cases. Common symptoms are cough (49%), fever (41%) and rhinorrhoea (21%). Pneumonia was reported in 4,394 cases (3.0%). Hospitalisation was reported for 26,383 (18%) of 148,286 COVID-19 cases with information on hospitalisation status. Since calendar week 17, cases are reported to the RKI as a distinct COVID-19 surveillance category. Since then, loss of smell and taste can also be entered as symptoms. At least one of these two symptoms was reported in 1,592 of 10,586 cases (15%).

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Approximately 158,000 people have recovered from their COVID-19 infection. Since the exact date of recovery is unknown in most cases, an algorithm was developed to estimate the number of recovered cases.

In total, 8,147 COVID-19-related deaths have been reported in Germany (4.6% of all confirmed cases). Of these, 4,515 (55%) are men and 3,627 (45%) are women (see

Table 2; gender was unknown in five cases). The median age was 82 years. Of all deaths, 7,021 (86%) were in people aged 70 years or older, but only 19% of all cases were in this age group. So far, three deaths among COVID-19 cases under 20 years of age have been reported to the RKI. Pre-existing medical conditions were reported for all three.

Table 2: Number of notified COVID-19 deaths by age group and gender (Data available for 8,142 of notified deaths; 21/05/2020, 12:00 AM)

Gender	Age group (in years)										
	0-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100+
Male		2	6	13	42	206	558	1,233	1,929	521	5
Female	1		2	6	16	70	199	594	1,734	960	45
Total	**1**	**2**	**8**	**19**	**58**	**276**	**757**	**1,827**	**3,663**	**1,481**	**50**

Occupation, accommodation or care in facilities

In accordance with the Protection Against Infection Law (IfSG), the RKI receives information on occupation, accommodation or care in a facility relevant for infection control for reported COVID-19 cases (see Table 3).

Since information on care/attendance, accommodation and occupation in these facilities is missing in 30% of cases, the proportion of cases cared for, accommodated or working in these facilities shown here should be considered minimums values. Among the COVID-19 cases reported as being cared for/attending, accommodated in or working in all of the above mentioned facilities, the proportion of cases that actually acquired their infection in these settings is unknown.

Until now, 12,140 cases with a SARS-CoV-2 infection have been notified among staff working in medical facilities as defined by Section 23 IfSG. Among the cases reported as working in medical facilities, 73% were female and 27% male. The median age was 41 years, 19 persons died.

The low number of cases among persons who attend or work in facilities providing child care or education (Section 33 IfSG) reflects the low incidence in children observed thus far.

The high number of cases among people cared for or working in various care facilities (Section 36 IfSG) is consistent with numerous reported outbreaks, especially in nursing homes.

Table 3: Notified COVID-19-cases according to possible occupation, accommodation or care in facilities relevant for transmission of infectious diseases (175,832* cases, no data available for 52,761 cases; 21/05/2020, 12:00 AM)

Facility according to		Total	Hospitalised	Deaths	Recovered (estimate)
§ 23 IfSG (e.g. hospitals, outpatient clinics and practices, dialysis clinics or outpatient nursing services)	Cared for / accommodated in facility	2,780	1,929	526	2,000
	Occupation in facility	12,140	557	19	11,600
§ 33 IfSG (e.g. day care facilities, kindergartens, facilities for after school care, schools or other educational facilities, children's homes, holiday camps)	Cared for / accommodated in facility	2,029*	56	1	1,900
	Occupation in facility	2,354	111	7	2,300

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§ 36 IfSG (e.g. facilities for the care of older, disabled, or other persons in need of care, homeless shelters, community facilities for asylum-seekers, repatriates and refugees as well as other mass accommodation and prisons)	Cared for / accommodated in facility	15,422	3,470	3,070	10,700
	Occupation in facility	8,746	372	43	8,200
§ 42 IfSG (e.g. kitchens in the catering trade, in inns, restaurants, canteens, cafés, or other establishments with or for communal catering)	Occupation in facility	2,116	142	54	1,700
Neither cared for, accommodated in nor working in a facility		77,484	14,049	3,061	71,400

*for care according to § 33 IfSG only cases under 18 years of age are taken into account, as other information may be assumed to be incorrect.
IfSG: Protection Against Infection Law

Outbreaks

Currently, COVID-19 outbreaks are ongoing in nursing homes and medical facilities in the districts of Greiz and Sonneberg, Thuringia, and the district of Coburg, Bavaria, where the 7-day-incidence is elevated. Control and screening measures have been implemented.

A Covid-19 outbreak among workers of a meat processing plant occurred in the districts of Straubing/Straubing-Bogen in Bavaria (7-day incidence is currently at 44 and 48 cases per 100,000 inhabitants, repectively). Control measures were implemented, including screening of all staff and contact tracing.

A further outbreak has been reported among workers of a meat processing plant in the district of Osnabrück (7-day incidence is currently at 18,5 cases per 100,000 inhabitants) (>90 positive among 278 workers tested thus far. Isolation of cases and contacts as well as control measures in the plant were implemented.

In an outbreak at a German Parcel Service (DPD) branch in the district of Heinsberg, >80 cases of COVID-19 were detected among the approximately 400 workers, all of whom were tested. Extensive contact tracing is ongoing. The current 7-day COVID-19 incidence in this district is 27 cases/100,000 inhabitants.

Estimation of the reproduction number (R)

The presented case numbers do not fully reflect the temporal progression of incident COVID-19 cases, since the time intervals between actual onset of illness and diagnosis, reporting, as well as transmission to the RKI vary greatly. Therefore, a nowcasting approach is applied to model the true temporal progression of COVID-19 cases according to illness onset. Figure 4 shows the result of this analysis.
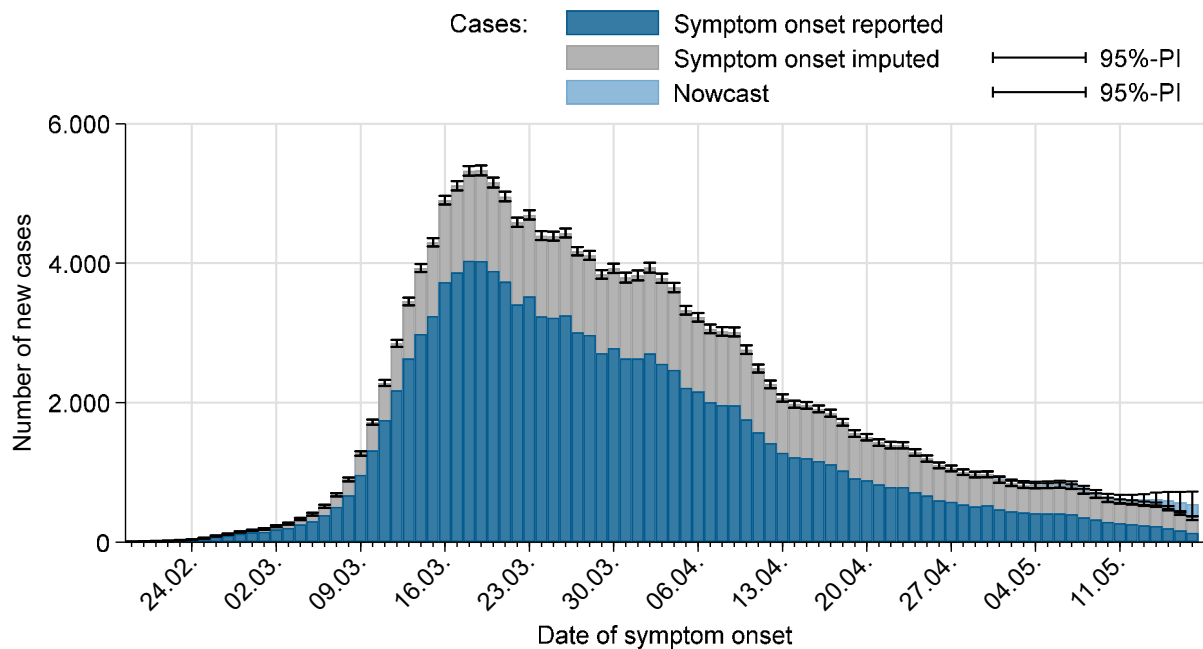
Figure 4: Display of cases with known onset of the disease (dark blue), estimated onset of the disease for cases where the onset of the disease has not beed reported (grey) and estimated course of already symptomatic cases (light blue) (as of 21/05/2020 12 AM, taking into account cases up to 16/05/2020).

The reproduction number, R, is defined as the mean number of people infected by an infected person. R can only be estimated based on statistical analyses such as nowcasting and not directly extracted from the notification system.

The R-value reported to date reflects the trend in the number of incident cases with a high degree of sensitivity. This value is thus sensitive to short-term changes in the number of cases - such as those caused by individual outbreaks - which can lead to relatively large fluctuations, especially if the total number of new cases is relatively low. In addition to this sensitive R-value, the RKI therefore now provides a second, more stable 7-day R-value, which is based on data from a longer time period and is therefore less subject to short-term fluctuations. Thus, it reflects trends more reliably, but is based on infections that occurred on average earlier than those on which the more sensitive R-value is based.

Both R-values are estimated on the basis of nowcasting. The nowcasting predicts the number of cases with illness onset up to the date of 4 days ago, as no reliable prediction can be made about the number of new cases in the last 3 days.

The sensitive R-value reported so far can be estimated using a moving 4-day average of the number of incident cases as estimated by nowcasting. It compares the 4-day mean of incident cases on one day with the corresponding mean 4 days before. Thus, taking into account that infection occurs four to six days before the onset of symptoms, the daily sensitive R-value represents the course of infection approximately one to two weeks ago. The current estimate is R= 0.89 (95% prediction interval: 0.74 – 1.07) and is based on electronically notified cases as of 21/05/2020, 12:00 AM.

Similarly, the 7-day R-value is estimated by using a moving 7-day average of the nowcasting curve. This compensates for fluctuations more effectively. The 7-day R-value then compares the 7-day average of the new cases on one day with the 7-day average four days earlier. The 7-day R thus represents a slightly later course of infection of about one to a little over two weeks ago. The 7-day R-value is estimated at 0.92 (95% predictation interval: 0.84 – 1,01) and is based on electronically notified cases as of 21/05/2020, 12:00 AM.

Sample calculations as well as an excel sheet presenting both R-values with daily updates can be found under www.rki.de/covid-19-nowcasting. A detailed methodological explanation of the more stable R-

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value is also available there. More general information and sample calculations for both R-values can also be found in our FAQs (www.rki.de/covid-19-faq).

A detailed description of the methodology is available at https://www.rki.de/DE/Content/Infekt/EpidBull/Archiv/2020/17/Art_02.html (Epid. Bull. 17 | 2020 from 23/04/2020)

DIVI intensive care register

A registry of the German Interdisciplinary Association for Intensive and Emergency Medicine (DIVI), the RKI and the German Hospital Federation (DKG) was established to document intensive care capacity as well as the number of COVID-19 cases treated in participating hospitals (https://www.intensivregister.de/#/intensivregister). The DIVI intensive care register documents the number of available intensive care beds in the reporting hospitals on a daily basis. Since 16/04/2020, all hospitals with intensive care beds are required to report.

As of 21/05/2020, a total of 1,273 hospitals or departments reported to the DIVI registry. Overall, 32,251 intensive care beds were registered, of which 20,372 (63%) are occupied, and 11,879 beds (37%) are currently available. The number of COVID-19 cases treated in participating hospitals is shown in Table 4.

Table 4: COVID-19 patients requiring intensive care (ICU) recorded in the DIVI register (21/05/2020, 9:15 AM).

	Number of patients	Percentage	Change to previous day
Currently in ICU	1,016		-29
- of these: mechanically ventilated	651	64%	-21
Discharged from ICU	12,707		+229
- of these: deaths	3,386	27%	+51

Information from further RKI-based surveillance systems for acute respiratory illnesses

GrippeWeb ("FluWeb") is a web interface at RKI for monitoring the activity of acute respiratory illness (ARI) utilizing information from the population. In week 20, 2020, the rate of ARI ("ARI rate" as well as the rate of influenza-like illnesses ("ILI-rate") has increased slightly. Since the end of the influenza epidemic in week 12, 2020, ARE and ILI rates have been remarkably lower than in previous seasons at this time of the year. Further information can be found under https://grippeweb.rki.de/.

The Influenza Working Group (AGI) monitors ARI through a sentinel network of physicians in private practices. In week 20, 2020, the number of patient visits due to respiratory infections has remained stable. Since week 15, 2020, no influenza activity has been detected within the viral surveillance of the AGI. A total of 13 SARS-CoV-2 positive samples have been detected in 1,398 tested samples (1%) sent from a subsample of the sentinel physicians since week 8, 2020. No SARS-COV-2 has been detected since week 16, 2020.Further information can be found under https://influenza.rki.de/.

A third, ICD-10 code based system, monitors severe acute respiratory illness (SARI) in hospitalized patients (ICD-10 codes J09 to J22: primary diagnoses influenza, pneumonia or other acute infections of the lower respiratory tract). In week 19, 2020, the total number of SARI cases has remained stable. 13% of all reported SARI cases in week 19, 2020, were diagnosed with COVID-19 (ICD-10 code U07.1!). Due to low case numbers, proportions of COVID-19 cases in different age groups were not calculated. Please note

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that only patients with an ICD-10 Code for SARI in the main DRG diagnosis and hospitalisation duration of up to one week were included in this analysis.

Assessment by the RKI

At the global and the national level, the situation is very dynamic and must be taken seriously. Severe and fatal courses occur in some cases. The number of newly reported cases, hospitalisations and fatalities in Germany is decreasing. The RKI currently assesses the risk to the health of the German population overall as **high** and as **very high** for risk groups. The probability of serious disease progression increases with increasing age and underlying illnesses. The risk of disease varies from region to region. The burden on the health care system depends on the geographical and age distribution of cases, health care capacity and initiation of containment measures (isolation, quarantine, physical distancing etc.), and may be very high in some geographical regions. This assessment may change on short notice as a result of new findings.

Measures taken by Germany

-   For persons entering Germany from EU countries, Schengen-associated countries or the UK the federal and state governments recommend quarantine if the country of origin has a high COVID-19 incidence (>50 cases/100,000 inhabitants in the past 7 days). https://www.rki.de/DE/Content/InfAZ/N/Neuartiges_Coronavirus/Quarantaene_Einreisen_Deutschland.html *(in German)*
-   (Non-medical) face masks must be worn on public transport and in shops in all federal states.
-   Data on current disease activity can be found in the daily situation reports and on the RKI dashboard https://corona.rki.de/.
-   RKI teams are currently supporting outbreak containment measures with a focus on outbreaks in retirement and health care homes as well as hospitals in several federal states.
-   A distance of 1.5 metres to other indivduals must be maintained in public spaces https://www.bundesregierung.de/breg-de/themen/coronavirus/besprechung-der-bundeskanzlerin-mit-den-regierungschefinnen-und-regierungschefs-der-laender-1733248 *(in German)*
-   German parliament passes second law to protect the population in the event of an epidemic situation of national importance on 14/05/2020 *(in German)* https://www.bundesgesundheitsministerium.de/presse/pressemitteilungen/2020/2-quartal/covid-19-bevoelkerungsschutz-2.html
-   A new federal law was implemented on 28/03/2020 for the protection of the public in the event of epidemic situations, granting the federal government additional competencies for the control of epidemics: https://www.bundesgesundheitsministerium.de/presse/pressemitteilungen/2020/1-quartal/corona-gesetzespaket-im-bundesrat.html *(in German)*
-   On 15/04/2020, the German government and the federal states agreed to gradually reduce physical distancing measures https://www.bundesregierung.de/breg-de/themen/coronavirus/fahrplan-corona-pandemie-1744202 (*in German*)

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