ROBERT KOCH INSTITUT

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

04/06/2020 - UPDATED STATUS FOR GERMANY

Confirmed cases	Deaths	Deaths (%)	Recovered
182,764 (+394*)	**8,581** (+30*)	**4.7%**	**ca. 167,800****

**Change from previous day; **Estimate*

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

Summary (as of 04/06/2020, 12:00 AM)

- In total, 182,764 COVID-19 cases and 8,581 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 (361), Baden-Wuerttemberg (315), Hamburg (277) and Saarland (276).
- Most cases (67%) are between 15 and 59 years old. Women (52%) and men (48%) are almost equally affected. Slightly more men (55%) than women (45%) died.
- 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.
- Outbreaks of COVID-19 have been reported in several federal states (including in institutions for asylum seekers and refugees, in meat processing plants and logistics companies, and in connection with religious events and family gatherings.

Epidemiological Situation in Germany

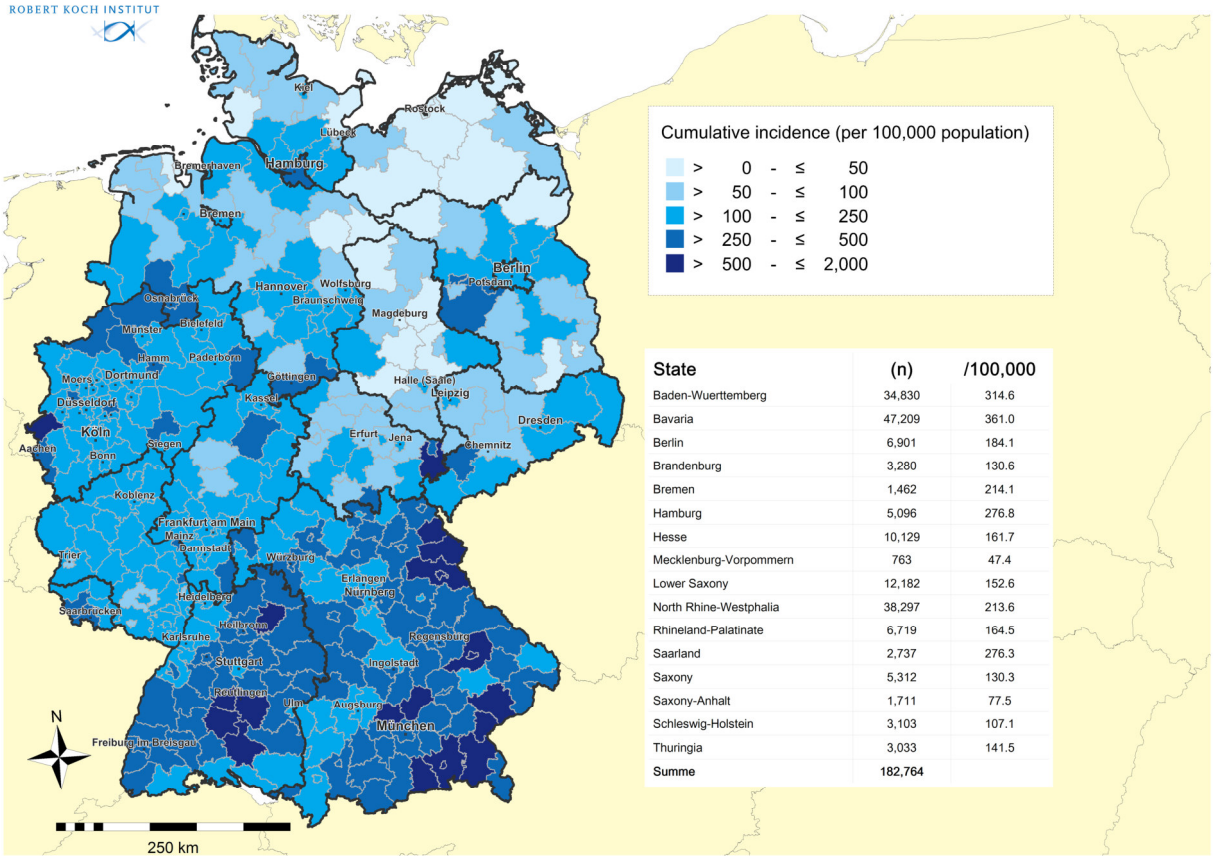
Geographical distribution of cases

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 182,764 (+394) laboratory-confirmed cases of coronavirus disease 2019 (COVID-19) have been electronically reported to and validated by the RKI, including 8,581 deaths (see Table 1 and Figure 1). A total of 116 districts reported no cases in the past 7 days. 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 (04/06/2020, 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 per 100,000 pop.	Number of deaths	Number of deaths/ 100,000 pop.
Baden-Wuerttemberg	34,830	17	315	148	1,3	1,761	15.9
Bavaria	47,209	71	361	386	3,0	2,479	19.0
Berlin	6,901	27	184	168	4,5	200	5.3
Brandenburg	3,280	7	131	24	1,0	156	6.2
Bremen	1,462	15	214	113	16,5	44	6.4
Hamburg	5,096	-2	277	14	0,8	253	13.7
Hesse	10,129	49	162	195	3,1	482	7.7
Mecklenburg-Western Pomerania	763	2	47	4	0,2	20	1.2
Lower Saxony	12,182	68	153	330	4,1	601	7.5
North Rhine-Westphalia	38,297	112	214	554	3,1	1,611	9.0
Rhineland-Palatinate	6,719	7	164	52	1,3	230	5.6
Saarland	2,737	2	276	21	2,1	164	16.6
Saxony	5,312	7	130	31	0,8	212	5.2
Saxony-Anhalt	1,711	4	77	8	0,4	55	2.5
Schleswig-Holstein	3,103	-3	107	33	1,1	146	5.0
Thuringia	3,033	11	142	81	3,8	167	7.8
Total	**182,764**	**394**	**220**	**2,162**	**2,6**	**8,581**	**10.3**

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



State	(n)	/100,000
Baden-Wuerttemberg	34,830	314.6
Bavaria	47,209	361.0
Berlin	6,901	184.1
Brandenburg	3,280	130.6
Bremen	1,462	214.1
Hamburg	5,096	276.8
Hesse	10,129	161.7
Mecklenburg-Vorpommern	763	47.4
Lower Saxony	12,182	152.6
North Rhine-Westphalia	38,297	213.6
Rhineland-Palatinate	6,719	164.5
Saarland	2,737	276.3
Saxony	5,312	130.3
Saxony-Anhalt	1,711	77.5
Schleswig-Holstein	3,103	107.1
Thuringia	3,033	141.5
Summe	**182,764**	

Figure 1: Number and cumulative incidence (per 100,000 population) of the 182,764 electronically reported COVID-19 cases in Germany by county and federal state (04/06/2020, 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 cases reported from 01.03.2020 onwards, the onset of symptoms is unknown in 55,707 cases (31%). When the the onset of symptoms is unknown, the date of reporting is provided in Figure 2.

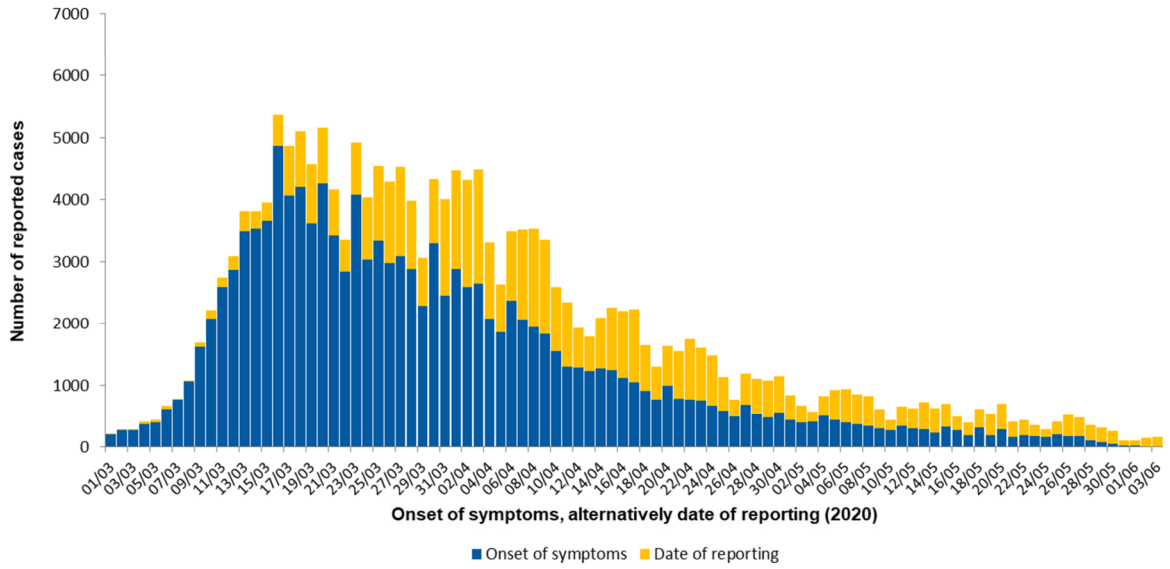


Figure 2: Number of electronically reported COVID-19 cases in Germany by date of symptom onset and by date of reporting from 01/03/2020 (04/06/2020, 12:00 AM).

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, 3,807 were children under 10 years of age (2.1%), 8,203 children and teenagers aged 10 to 19 years (4.5%), 79.128 persons aged 20 to 49 years (43%), 56,930 persons aged 50 to 69 years (31%), 29,373 persons aged 70 to 89 years (16%) and 5,214 persons aged 90 years and older (2.9%). The age is unknown in 109 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).

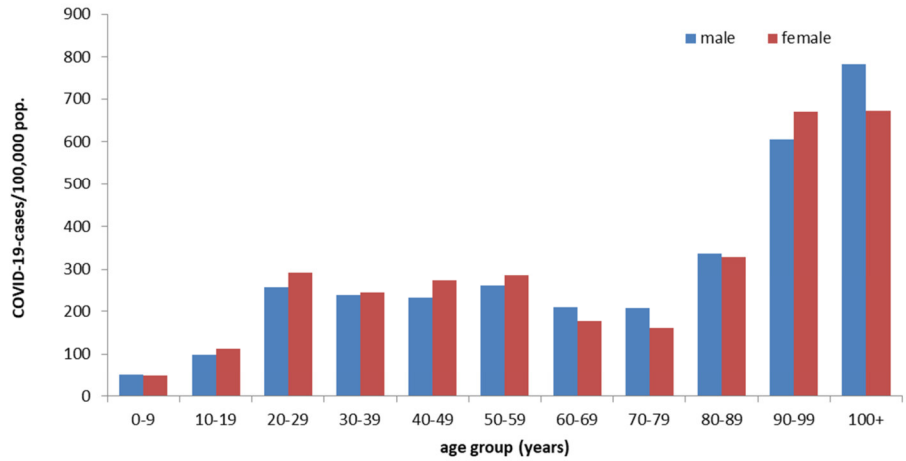


Figure 3: Electronically reported COVID-19 cases/100,000 population in Germany by age group and gender (n=182,336) for cases with information available (04/06/2020, 12:00 AM).

Clinical aspects

Information on symptoms is available for 155,055 (85%) of the notified cases. Common symptoms are cough (49%), fever (41%) and rhinorrhoea (21%). Pneumonia was reported in 4,666 cases (3.0%). 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 2,224 of 14,648 cases (15%).

Hospitalisation was reported for 27,700 (18%) of 155,963 COVID-19 cases with information on hospitalisation status.

Approximately 167,800 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, 8,581 COVID-19-related deaths have been reported in Germany (4.7% of all confirmed cases). Of these, 4,758 (55%) are men and 3,818 (45%) are women (see Table 2; gender was unknown in five cases). The median age was 82 years. Of all deaths, 7,376 (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 8,576 of notified deaths; 04/06/2020, 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	0	2	6	15	49	220	600	1,300	2,018	543	5
Female	1	0	3	6	18	72	211	624	1,823	1,015	45
Total	**1**	**2**	**9**	**21**	**67**	**292**	**811**	**1,924**	**3,841**	**1,558**	**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 (Table 3).

Since information on care/attendance, accommodation and occupation in these facilities is missing in 28% 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.

Table 3: Notified COVID-19-cases according to possible occupation, accommodation or care in facilities relevant for transmission of infectious diseases (181,782* cases, no data available for 50,652 cases; 04/06/2020, 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	3,021	2,125	570	2,300
	Occupation in facility	12,955	596	20	12,700
§ 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*	2,305	59	1	2,100
	Occupation in facility	2,508	122	7	2,400
§ 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	16,674	3,775	3,277	12,400
	Occupation in facility	9,367	397	49	9,000
§ 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	2,485	162	51**	2,300
Neither cared for, accommodated in nor working in a facility		81,815	14,795	3,248	76,700

*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

*** incorrect high case number due to technical data transmission problems*

Until now, 12,955 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, 20 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.

Outbreaks

A high 7-day incidence rate was observed in two cities or districts, primarily due to localised outbreaks: in the district Sonneberg (Thuringia) and in the city Bremerhaven (Bremen).

In the city of Bremerhaven and surrounding districts, an outbreak extending to other districts occurred within a religious community, and another outbreak occurred following a large family gathering. In the district of Sonneberg, an outbreak occurred in a nursing home for the elderly in which both residents and employees were infected with SARS-Cov-2.

A large Covid-19 outbreak occurred in the district of Göttingen related to family gatherings, for which a large number of contact persons has been identified. Due a high number of affected children, numerous schools and day care institutions were temporarily closed.

Outbreaks continue to occur in meat-processing plants in several federal states, some of which have led to production closures. Outbreaks in religious communities have been reported from Berlin and Hessen. In addition, several large outbreaks have occurred among workers at logistics companies, for instance in Northrhine-Westfalia and Lower Saxony.

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.

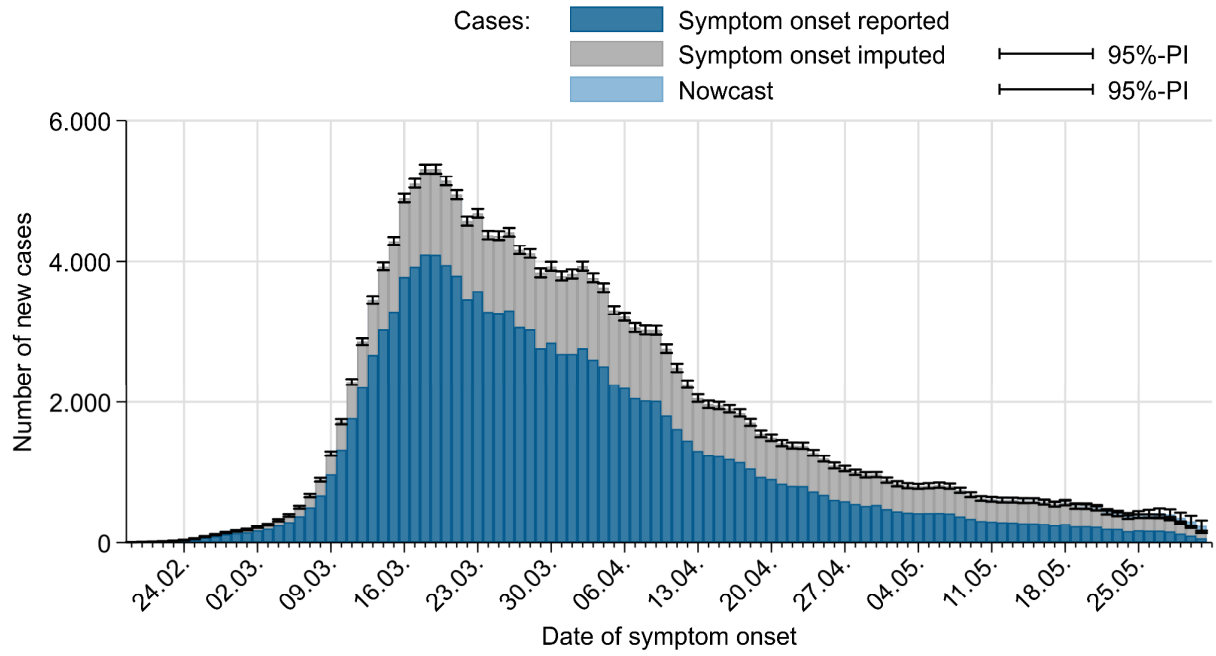


Figure 4: Number of notified COVID-19 cases with known date of illness onset (dark blue), estimated date of illness onset for cases without reported date of onset (grey) and estimated number of not yet notified cases according to illness onset (light blue) (as of 04/06/2020 12 AM, taking into account cases up to 31/05/2020).

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

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. s

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 incidenct 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 = 0.57 (95%-prediction interval: 0.46 – 0.68) and is based on electronically notified cases as of 04/06/2020, 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 0.80 (95% predictation interval: 0.74– 0.86) and is based on electronically notified cases as of 04/06/2020, 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-value is also available there. More general information and sample calculations for both R-values can also be found in our FAQs (http://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 04/06/2020, a total of 1,271 hospitals or departments reported to the DIVI registry. Overall, 32,403 intensive care beds were registered, of which 20,953 (65%) are occupied, and 11,450 beds (35%) 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 (04/06/2020, 9:15 AM).

	Number of patients	Percentage	Change to previous day
Currently in ICU	600		-32
- of these: mechanically ventilated	341	57%	-19
Discharged from ICU	13,946		+114
- of these: deaths	3,633	26%	+30

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 22, 2020, the rate of ARI ("ARI rate") increased slightly. Since the end of the influenza epidemic in week 12, 2020, the ARI rate has 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 22, 2020, the number of patient visits due to respiratory infections increased for all age groups, but remained on a very low level. Since week 15, 2020, no influenza activity was detected by the viral surveillance of the AGI. 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 of influenza, pneumonia or other acute infections of the lower respiratory tract). In week 21, 2020, the total number of SARI cases remained stable at an unusually low level. Of all reported SARI cases in week 21, 2020, 5% were diagnosed with COVID-19 (ICD-10 code U07.1!). The proportion of COVID-19 cases has been decreasing since week 14, 2020 (Figure 5). Please note that only patients with an ICD-10 Code for SARI as the main diagnosis and hospitalisation duration of up to one week were included in this analysis.

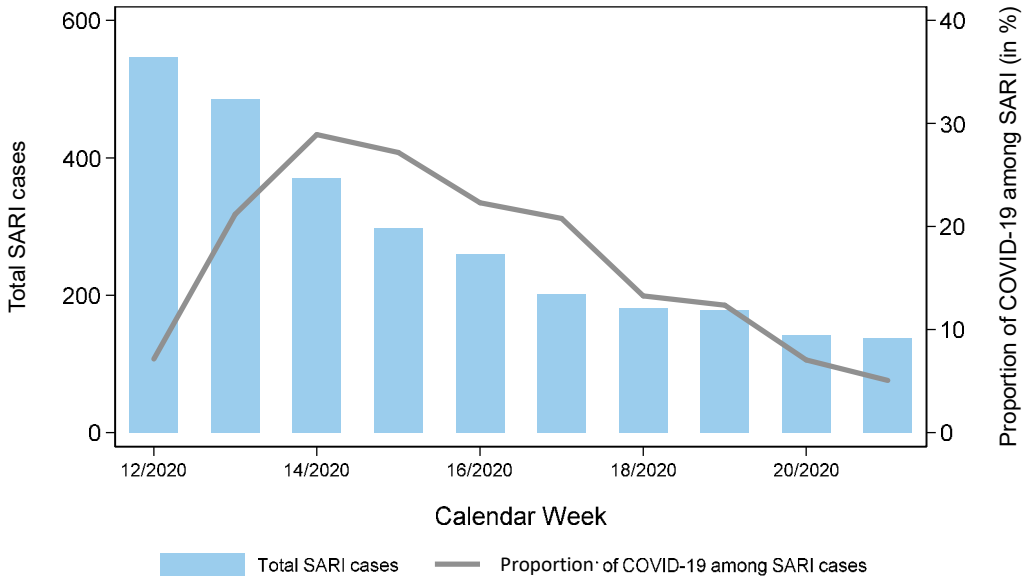


Figure 5: Weekly number of SARI cases (ICD-10 codes J09-J22) and proportion of cases with a diagnosis of COVID-19 (ICD-10 code U07.1!) among SARI cases with duration of hospitalisation of up to one week and with date of admission in weeks 12 to 21, 2020, from 70 sentinel hospitals

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

Risk Assessment by the RKI

General assessment

At the global and the national level, the situation is very dynamic and must be taken seriously. The number of newly reported cases 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. This assessment may change at short notice based on new insights.

Infection risk

The risk of infection depends heavily on the regional spread, living conditions and also on individual behaviour.

Disease severity

In most cases, the disease is mild. The probability of progression towards serious disease increases with increasing age and underlying illnesses.

Burden on health system

The burden on the health care system depends on the geographical distribution of cases, health care capacity and initiation of containment measures (isolation, quarantine, physical distancing etc.). The burden is currently low in many regions, but may be high in some locations.

Measures taken by Germany

- From 15 June, travel within Europe should be possible again – provided the COVID-19 activity in destination countries permits this. https://www.bundesregierung.de/breg-de/themen/coronavirus/reisen-wieder-moeglich-1757372 *(in German)*
- Information on additional regulations at the regional level regarding physical distancing can be found here: https://www.bundesregierung.de/breg-de/themen/coronavirus/corona-bundeslaender-1745198 *(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/
- 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)*

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