ROBERT KOCH INSTITUT

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

19/05/2020 - UPDATED STATUS FOR GERMANY

Confirmed cases	Deaths	Deaths (%)	Recovered
175,210 (+513*)	**8,007** (+72*)	**4.6%**	**ca. 155,700****

**Change from previous day; **Estimate*

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

Summary (as of 19/05/2020, 12:00 AM)

- In total, 175,210 COVID-19 cases and 8,007 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 (349), Baden-Wuerttemberg (307), Hamburg (274) and Saarland (272).
- 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, e.g in the districts of Greiz and Sonneberg in Thuringia, and in the district of Coburg in Bavaria.
- 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

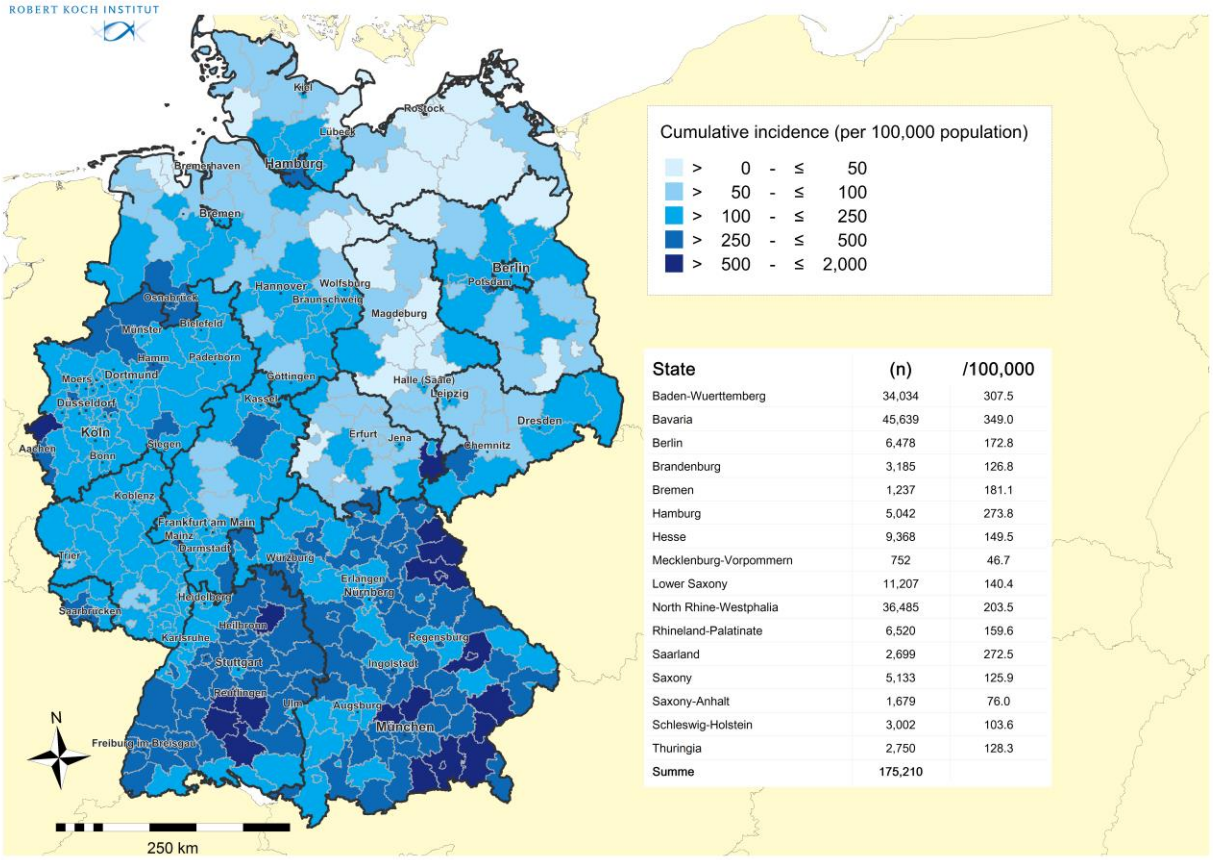
Geographical distribution of cases

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 175,210 (+513) laboratory-confirmed cases of coronavirus disease 2019 (COVID-19) have been electronically reported to and validated by the RKI, including 8,007 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 (19/05/2020, 12:00 AM). * No data were transmitted from Rhineland-Palatinate yesterday.

Federal State	Total Number of cases	Number of new cases	Cases/100,000 pop.	Number of deaths	Number of deaths/ 100,000 pop.
Baden-Wuerttemberg	34,034	34	307	1,653	14.9
Bavaria	45,639	132	349	2,314	17.7
Berlin	6,478	20	173	182	4.9
Brandenburg	3,185	13	127	150	6.0
Bremen	1,237	66	181	38	5.6
Hamburg	5,042	5	274	232	12.6
Hesse	9,368	31	150	442	7.1
Mecklenburg-Western Pomerania	752	0	47	20	1.2
Lower Saxony	11,207	40	140	548	6.9
North Rhine-Westphalia	36,485	120	203	1,525	8.5
Rhineland-Palatinate*	6,520	30	160	222	5.4
Saarland	2,699	3	272	154	15.5
Saxony	5,133	8	126	198	4.9
Saxony-Anhalt	1,679	1	76	54	2.4
Schleswig-Holstein	3,002	0	104	128	4.4
Thuringia	2,750	10	128	147	6.9
Total	**175,210**	**513**	**211**	**8,007**	**9.6**

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



State	(n)	/100,000
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Schleswig-Holstein	3,002	103.6
Thuringia	2,750	128.3
Summe	175,210	

Figure 1: Number and cumulative incidence (per 100,000 population) of the 175,210 electronically reported COVID-19 cases in Germany by county and federal state (19/05/2020, 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. When the the onset of symptoms is unknown, the date of reporting is provided (55,160 cases).

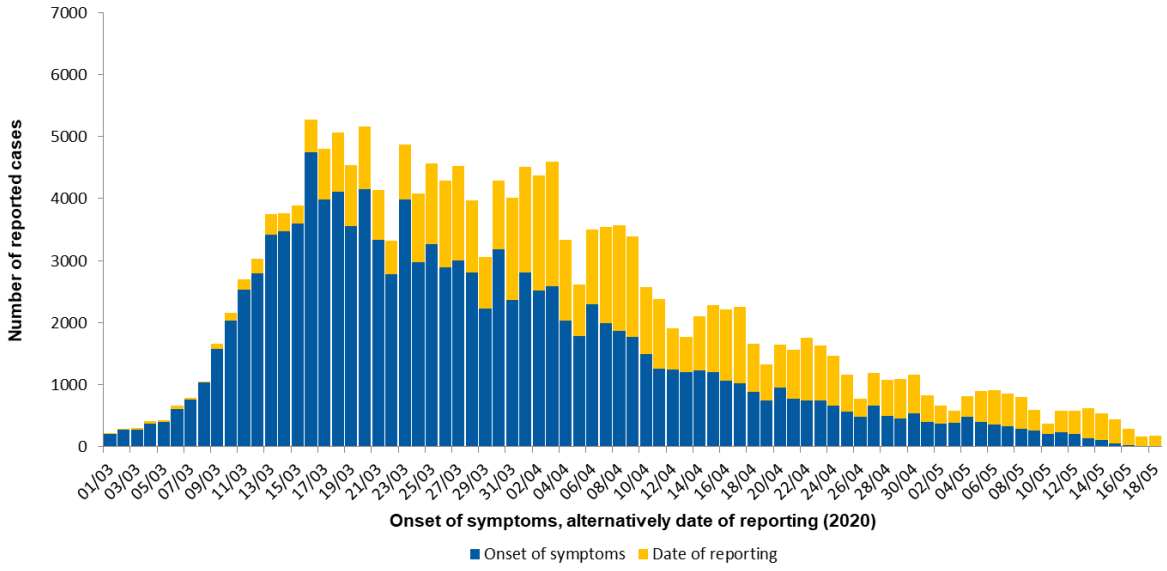

Figure 2: Number of electronically reported COVID-19 cases in Germany by date of symptom onset and by date of reporting from 01/03/2020 (19/05/2020, 12:00 AM).

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, 3,359 were children under 10 years of age (1.9%), 7,603 children and teenagers aged 10 to 19 years (4.3%), 75,439 persons aged 20 to 49 years (43%), 55,201 persons aged 50 to 69 years (32%), 28,460 persons aged 70 to 89 years (16%) and 5.019 persons aged 90 years and older (2.9%). The age is unknown in 129 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 (see Table 2 and Figure 3).

Table 2: Number of notified COVID-19 deaths by age group and gender (Data available for 8,002 of notified deaths; 19/05/2020, 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	204	548	1.212	1.891	515	5
Female	1		2	6	15	68	194	582	1.704	947	45
Total	**1**	**2**	**8**	**19**	**57**	**272**	**742**	**1.794**	**3.595**	**1.462**	**50**

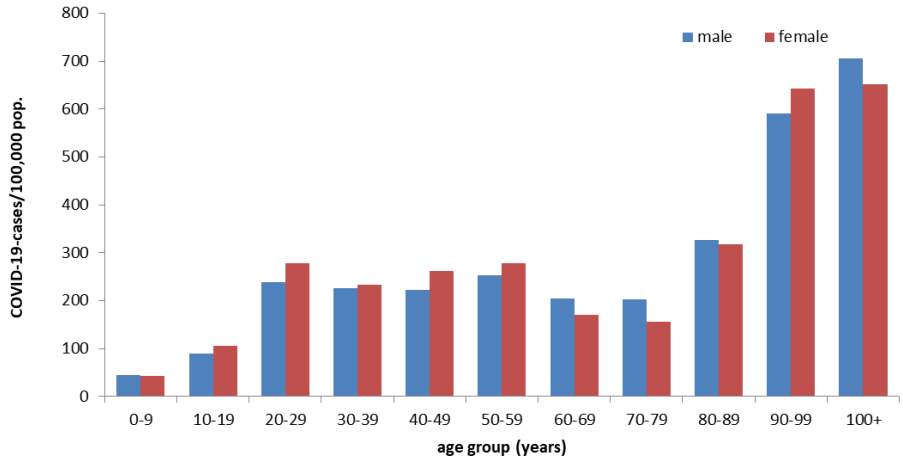

Figure 3: Electronically reported COVID-19 cases/100,000 population in Germany by age group and gender (n=174,720) for cases with information available (19/05/2020, 12:00 AM).

Table 3 shows the mean age, gender distribution, percentage of hospitalized cases and deaths among cases reported in calendar weeks 10 to 20. The percentage of deaths in weeks 19 and 20 are not yet meaningful, as the outcome is not yet known for all cases.

Table 3: The COVID-19 cases reported to the RKI according to gender and the proportion of hospitalization and deceased for the reporting weeks 10 - 20 (12.05.2020, 12AM).

Reporting week	10	11	12	13	14	15	16	17	18	19	20
Total cases	900	6,378	22,396	34,022	36,056	27,163	17,321	12,420	7,430	6,202	4,515
Mean age	43	45	46	48	51	52	52	51	49	47	46
Men	53%	56%	55%	50%	45%	44%	45%	45%	48%	48%	49%
Women	47%	44%	45%	50%	55%	56%	55%	55%	52%	52%	51%
Number with information on hospitalisation	788	5,439	18,572	28,222	30,066	22,951	14,662	10,308	6,231	5,162	3,576
Number hospitalized	164	494	2,110	4,888	5,801	4,471	3,162	2,086	1,257	935	582
Percent hospitalized	21%	9%	11%	17%	19%	19%	22%	20%	20%	18%	16%
Number of deaths	11	75	458	1,400	2,126	1,731	1,103	629	293	138	41
Percent deaths	1.2%	1.2%	2.0%	4.1%	5.9%	6.4%	6.4%	5.1%	3.9%	2.2%*	0.9%*

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

*Data not yet meaningful, as the outcome for all cases is not yet known

The depiction of notified COVID-19 cases in Germany according to age group and reporting week reveals a noticable increase in the proportion of cases among persons over 70 years of age in weeks 12 to 15 (Figure 4). The increase can be explained to a large extent by the occurrence of outbreaks in retirement and nursing homes aw well as hospitals. Since week 18, the percentage in this age group has decreased somewhat.

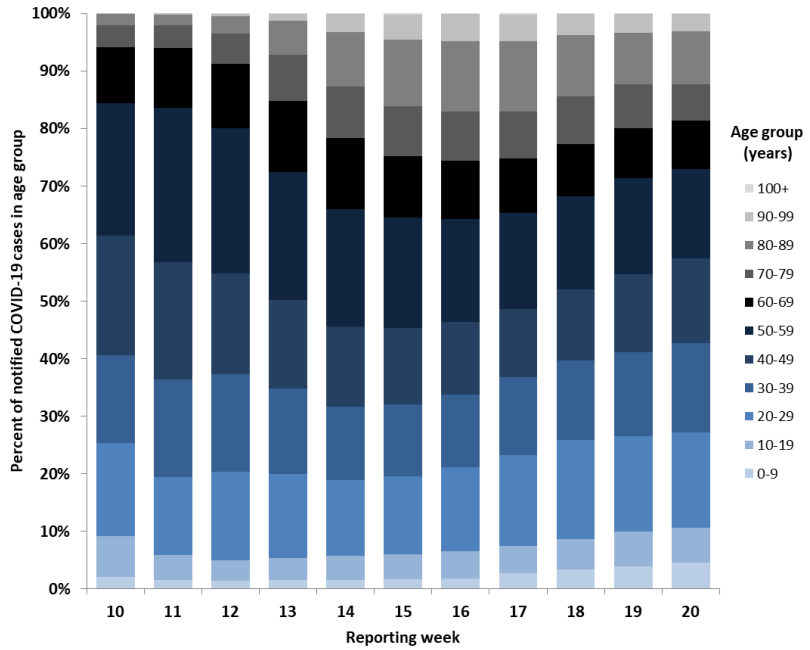

Figure 4: Percent of notified Covid-19 cases by age group and reporting week (n=174,675 cases with respective data in the weeks 10 to 20 as of 19/05/2020 12 AM).

Clinical aspects

Information on symptoms is available for 146,423 (84%) of the notified cases. Common symptoms are cough (49%), fever (41%) and rhinorrhoea (21%). Pneumonia was reported in 4,310 cases (2.9%). Hospitalisation was reported for 26,040 (18%) of 146,274 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, similar to other reported infectious diseases. Since then, loss of smell and taste can also be entered as symptoms. At least one of these two symptoms were reported in 1,445 of 9,671 cases (15%) recorded in the COVID-19 category.

Approximately 155,700 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, 8,007 COVID-19-related deaths have been reported in Germany (4.5% of all confirmed cases). Of these, 4,438 (55%) are men and 3,564 (45%) are women (see Table 2; gender was unknown in five cases). The median age was 82 years. Of all deaths, 6,904 (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.

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 4).

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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, 11,963 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 4: Notified COVID-19-cases according to possible occupation, accommodation or care in facilities relevant for transmission of infectious diseases (174.281* cases, no data available for 53,298 cases; 19/05/2020, 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	2,720	1,875	508	1,900
	Occupation in facility	11,963	546	19	11,400
§ 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	1,971*	55	1	1,800
	Occupation in facility	2,326	112	7	2,200
§ 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	14,936	3,399	3,007	10,200
	Occupation in facility	8,606	361	42	8,000
§ 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	2,087	138	55	1,500
Neither cared for, accommodated in nor working in a facility		76,374	13,852	3,023	70,200

*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 Strauing/Straubing-Bogen in Bavaria (7-day incidence is currently at 54 and 48 cases per 100,000 inhabitants, repectively). Control measures were implemented, including screening of all staff and contact tracing.

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Another COVID-19 outbreak occurred in a meat processing plant in the district of Coesfeld in North Rhine-Westphalia, where the 7-day incidence is currently at 26 cases per 100,000 inhabitants. The lifting of selected lock down measures was postponed to the 18/05/2020. The plant was closed until the 18/05/2020.

A further outbreak has been reported among workers of a meat processing plant in the district of Osnabrück (>90 positive among 278 workers tested thus far), many of whom were hired by the same subcontractor that hired workers for the plant in Coesfeld. 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, as of 18/05/2020, >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 25 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 5 shows the result of this analysis.

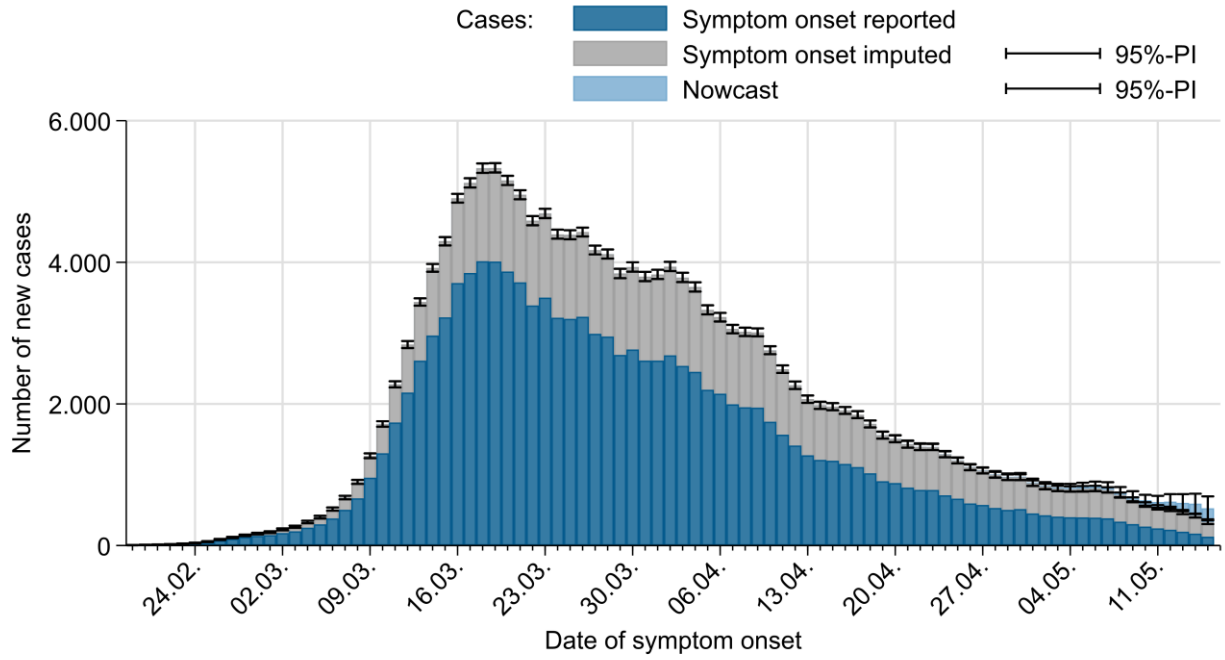

Figure 5: Display of cases with known onset of the disease (dark blue), estimated onset of the disease for cases where the onset of the disease has not beed reported (grey) and estimated course of already symptomatic cases (light blue) (as of 19/05/2020 12 AM, taking into account cases up to 15/05/2020).

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 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= 0.86 (95% prediction interval: 0.73 – 1.02) and is based on electronically notified cases as of 19/05/2020, 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 0.81 (95% predictation interval: 0.75 - 0.89) and is based on electronically notified cases as of 19/05/2020, 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-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 19/05/2020, a total of 1,271 hospitals or departments reported to the DIVI registry. Overall, 32,177 intensive care beds were registered, of which 19,972 (62%) are occupied, and 12,205 beds (38%) are currently available. The number of COVID-19 cases treated in participating hospitals is shown in Table 5.

Table 5: COVID-19 patients requiring intensive care (ICU) recorded in the DIVI register (19/05/2020, 9:15 AM).

	Number of patients	Percentage	Change to previous day
Currently in ICU	1,115		-18
- of these: mechanically ventilated	716	64%	-31
Discharged from ICU	12,249		-81
- of these: deaths	3,289	27%	-212

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

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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