ROBERT KOCH INSTITUT

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

16/05/2020 - UPDATED STATUS FOR GERMANY

Confirmed cases	Deaths	Deaths (%)	Recovered
173,772	**7,881**	**4.5%**	**ca. 152,600****
(+620*)	(+57*)		

*Change from previous day; **Estimate

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

Summary (as of 16/05/2020, 12:00 AM)

- In total, 173,772 COVID-19 cases and 7,881 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 (347), Baden-Wuerttemberg (306), Hamburg (272) and Saarland (271).
- 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 reported in nursing homes and hospitals, e.g in the district of Greiz and Sonneberg in Thuringia.
- In addition, COVID-19 outbreaks among meat plant workers have been reported in several federal states, among others in North Rhine-Westphalia and Bavaria.
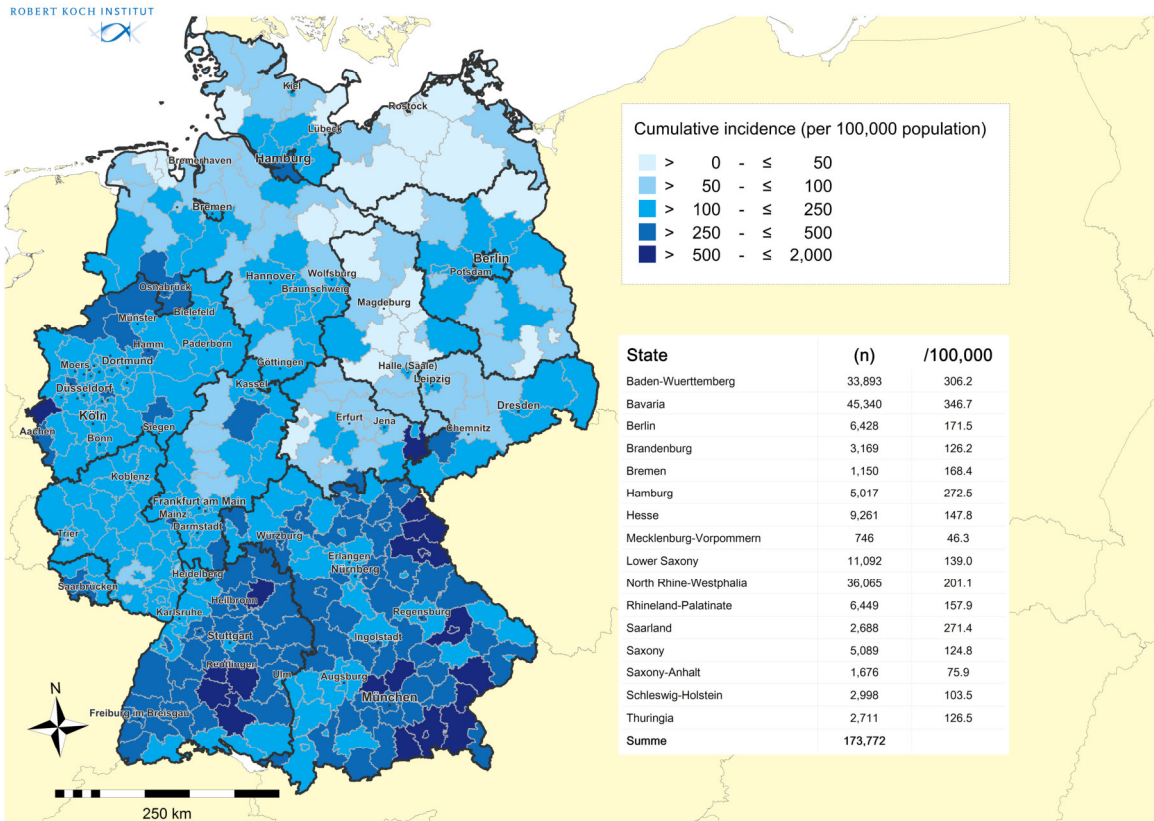
Epidemiological Situation in Germany

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 173,772 (+620) laboratory-confirmed cases of coronavirus disease 2019 (COVID-19) have been electronically reported to and validated by the RKI, including 7,881 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 (16/05/2020, 12:00 AM).

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	33,893	42	306	1,644	14.9
Bavaria	45,340	197	347	2,273	17.4
Berlin	6,428	31	171	181	4.8
Brandenburg	3,169	11	126	149	5.9
Bremen	1,150	21	168	37	5.4
Hamburg	5,017	36	272	231	12.5
Hesse	9,261	57	148	432	6.9
Mecklenburg-Western Pomerania	746	6	46	20	1.2
Lower Saxony	11,092	5	139	535	6.7
North Rhine-Westphalia	36,065	98	201	1,500	8.4
Rhineland-Palatinate	6,449	36	158	216	5.3
Saarland	2,688	4	271	149	15.0
Saxony	5,089	28	125	197	4.8
Saxony-Anhalt	1,676	8	76	54	2.4
Schleswig-Holstein	2,998	10	103	126	4.3
Thuringia	2,711	30	126	137	6.4
Total	**173,772**	**620**	**209**	**7,881**	**9.5**

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

State	(n)	/100,000
Baden-Wuerttemberg	33,893	306.2
Bavaria	45,340	346.7
Berlin	6,428	171.5
Brandenburg	3,169	126.2
Bremen	1,150	168.4
Hamburg	5,017	272.5
Hesse	9,261	147.8
Mecklenburg-Vorpommern	746	46.3
Lower Saxony	11,092	139.0
North Rhine-Westphalia	36,065	201.1
Rhineland-Palatinate	6,449	157.9
Saarland	2,688	271.4
Saxony	5,089	124.8
Saxony-Anhalt	1,676	75.9
Schleswig-Holstein	2,998	103.5
Thuringia	2,711	126.5
Summe	**173,772**	

Figure 1: Number and cumulative incidence (per 100,000 population) of the 173,772 electronically reported COVID-19 cases in Germany by county and federal state (16/05/2020, 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 (54,890 cases).
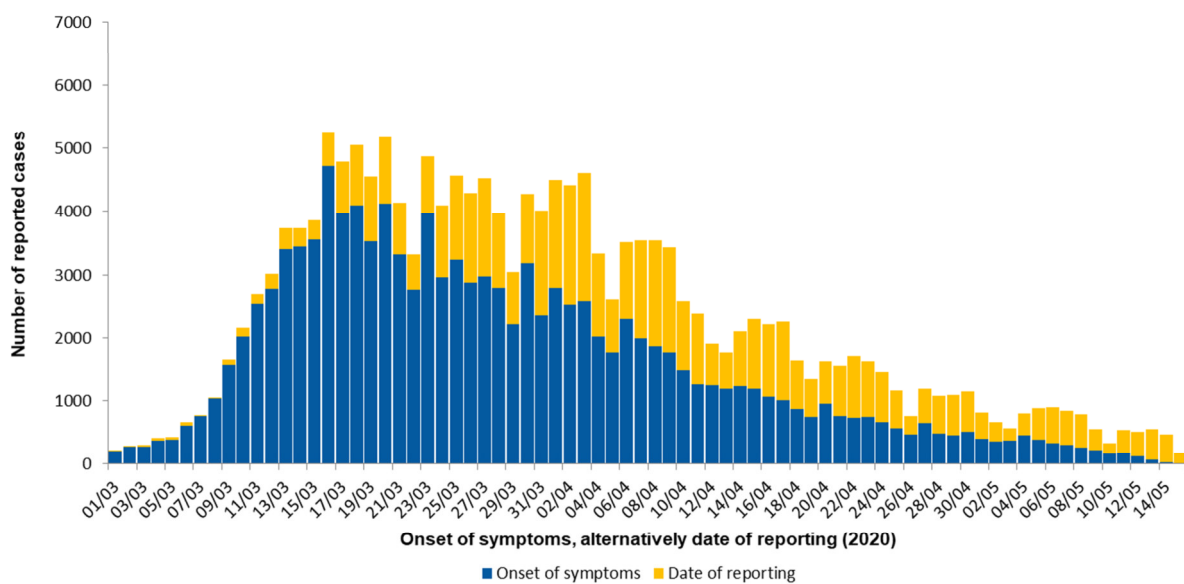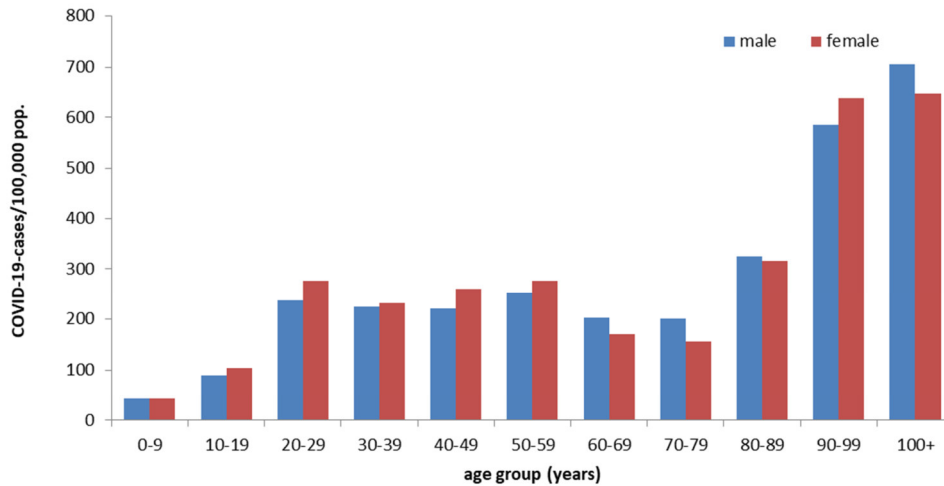

Figure 2: Number of electronically reported COVID-19 cases in Germany by date of symptom onset and by date of reporting from 01/03/2020 (16/05/2020, 12:00 AM).

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, 3,271 were children under 10 years of age (1.9%), 7,489 children and teenagers aged 10 to 19 years (4.3%), 74,771 persons aged 20 to 49 years (43%), 54,873 persons aged 50 to 69 years (32%), 28.260 persons aged 70 to 89 years (16%) and 4,982 persons aged 90 years and older (2.9%). The age is unknown in 126 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 Figure 3).

Figure 3: Electronically reported COVID-19 cases/100,000 population in Germany by age group and gender (n=173,287) for cases with information available (16/05/2020, 12:00 AM).

Clinical aspects

Information on symptoms is available for 145,063 (83%) of the notified cases. Common symptoms are cough (49%), fever (41%) and rhinorrhoea (21%). Pneumonia was reported in 4,239 cases (2.9%). Hospitalisation was reported for 25,736 (18%) of 144,839 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 1,317 of 8,851 cases (15%) recorded in the COVID-19 category.

Approximately 152,600 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.

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	40	201	537	1,191	1,868	509	5
Female	1		2	6	15	68	187	573	1,680	928	44
Total	1	2	8	19	55	269	724	1,764	3,548	1,437	49

Table 2: Number of notified COVID-19 deaths by age group and gender (Data available for 7,876 of notified deaths; 16/05/2020, 12:00 AM)

In total, 7,881 COVID-19-related deaths have been reported in Germany (4.5% of all confirmed cases). Of these, 4,372 (56%) are men and 3,504 (44%) are women (see **Fehler! Verweisquelle konnte nicht gefunden werden.**; gender was unknown in five cases). The median age was 82 years. Of all deaths, 6,801 (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 who were less than 20 years of age have been reported to the RKI. For all three cases, pre-existing conditions were reported.

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

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 31% 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 (172,859* cases, no data available for 53,435 cases; 16/05/2020, 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	2,693	1,852	498	1,800
	Occupation in facility	11,780	537	18	11,100
§ 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	1,934*	54	1	1,800
	Occupation in facility	2,293	109	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	14,624	3,325	2,951	9,800
	Occupation in facility	8,499	353	42	7,800
§ 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	2,023	131	55	1,300
Neither cared for, accommodated in nor working in a facility		75,578	13,674	2,970	68,900

*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

Until now, 11,780 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, 18 persons died.

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. 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.

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

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.

Due to a COVID-19 outbreak in a meat processing plant in the district of Coesfeld in North Rhine-Westphalia, the 7-day incidence per 100,000 inhabitants amounts to over 60 cases. The lifting of selected lock down measures was postponed to the 18/05/2020. The plant is now closed until the 17/05/2020. A Covid-19 outbreak among meat plant workers occurred in the district of Straubing-Bogen in Bavaria. Corresponding measures, such as screening of all personnel and contact tracing were carried out.

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.
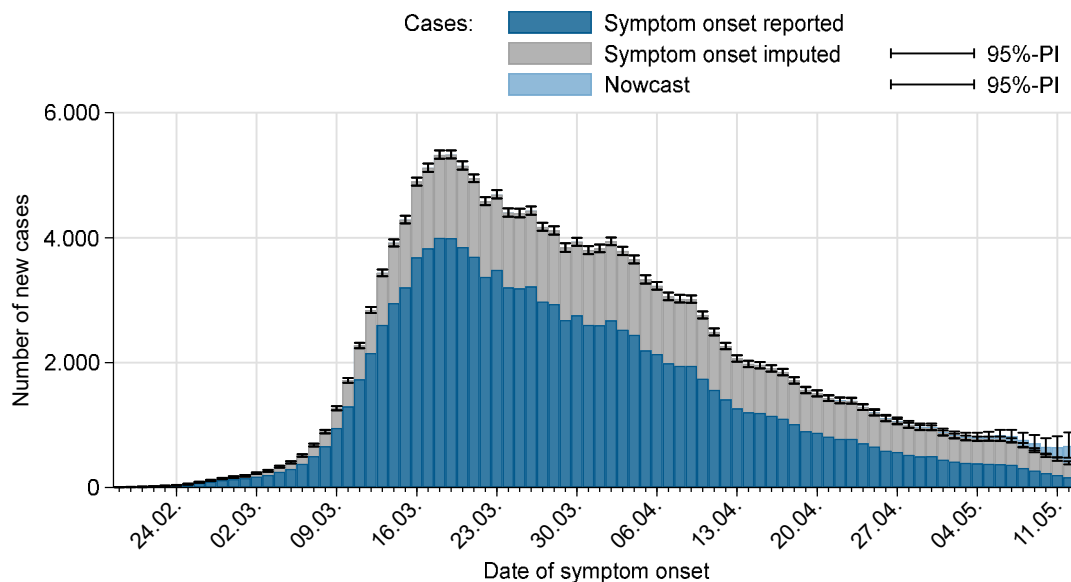
Figure 4: Display of cases with known onset of the disease (dark blue), estimated onset of the disease for cases where the onset of the disease has not beed reported (grey) and estimated course of already symptomatic cases (light blue) (as of 16/05/2020 12 AM, taking into account cases up to 12/05/2020).

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 and can indicate a possible change of tendency. However, this value is 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 low. In addition to this sensitive R-value, the RKI therefore now provides a second more stable 7-day R-value, which refers to a longer period of time and is therefore subject to less short-term fluctuations.

Both R-values are estimated on the basis of nowcasting. The nowcasting ends on the date of 4 days ago (today ended on the 12th of May 2020), as no reliable prediction can be made about the number of new cases in the last 3 days.

The so far reported sensitive R-value can be estimated by using a moving 4-day average of the number of new cases with symptoms estimated by nowcasting. It compares the 4-day mean of new symptomatic cases on one day with the corresponding mean 4 days before.

Thus, taking also into account that the time of 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= 0.88 (95% prediction interval: 0.72 − 1.05) and is based on electronically notified cases as of 16/05/2020, 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 slithly later course of infection of about one to a little more than two weeks ago. The 7-day R-value is estimated at 0.89 (95% predictation interval: 0.81 - 0.97) and is based on electronically notified cases as of 16/05/2020, 12:00 AM.

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 16/05/2020, a total of 1,271 hospitals or departments reported to the DIVI registry. Overall, 32,539 intensive care beds were registered, of which 20,498 (63%) are occupied, and 12,041 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 (16/05/2020, 9:15 AM).

	Number of patients	Percentage	Change to previous day
Currently in ICU	1,203		-91
- of these: mechanically ventilated	821	68%	-17
Discharged from ICU	12,205		+129
- of these: deaths	3,494	29%	+19

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

- (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.
- In public spaces, a distance of 1.5 metres to other indivduals must be maintained https://www.bundesregierung.de/breg-de/themen/coronavirus/besprechung-der-bundeskanzlerin-mit-den-regierungschefinnen-und-regierungschefs-der-laender-1733248 *(in German)*
- 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*)

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