ROBERT KOCH INSTITUT

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

15/05/2020 - UPDATED STATUS FOR GERMANY

Confirmed cases	Deaths	Deaths (%)	Recovered
173,152 (+913*)	**7,824** (+101*)	**4.5%**	**ca. 151,700****

**Change from previous day; **Estimate*

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

Summary (as of 15/05/2020, 12:00 AM)

- In total, 173,152 COVID-19 cases and 7,824 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 (345), Baden-Wuerttemberg (306), Saarland (271) and Hamburg (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, some associated with a high number of deaths. In addition, outbreaks in meat plant workers have been reported from 3 federal states.

Epidemiological Situation in Germany

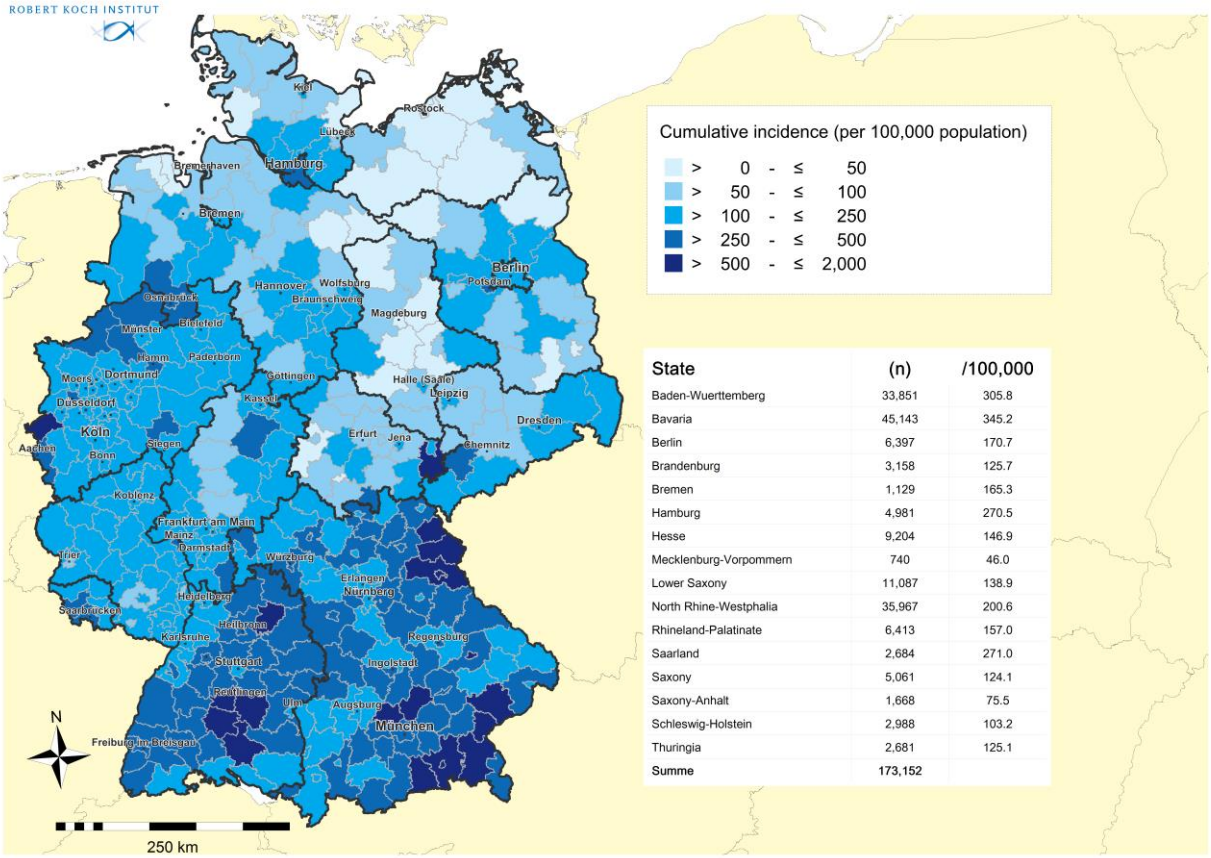
Geographical distribution of cases

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 173,152 (+913) laboratory-confirmed cases of coronavirus disease 2019 (COVID-19) have been electronically reported to and validated by the RKI, including 7,824 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 (15/05/2020, 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	33,851	181	306	1,628	14.7
Bavaria	45,143	163	345	2,260	17.3
Berlin	6,397	55	171	177	4.7
Brandenburg	3,158	23	126	148	5.9
Bremen	1,129	25	165	37	5.4
Hamburg	4,981	5	271	228	12.4
Hesse	9,204	35	147	429	6.8
Mecklenburg-Western Pomerania	740	1	46	20	1.2
Lower Saxony	11,087	84	139	534	6.7
North Rhine-Westphalia	35,967	226	201	1,493	8.3
Rhineland-Palatinate	6,413	31	157	213	5.2
Saarland	2,684	7	271	147	14.8
Saxony	5,061	30	124	195	4.8
Saxony-Anhalt	1,668	12	76	54	2.4
Schleswig-Holstein	2,988	6	103	126	4.3
Thuringia	2,681	29	125	135	6.3
Total	**173,152**	**913**	**208**	**7,824**	**9.4**

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



State	(n)	/100,000
Baden-Wuerttemberg	33,851	305.8
Bavaria	45,143	345.2
Berlin	6,397	170.7
Brandenburg	3,158	125.7
Bremen	1,129	165.3
Hamburg	4,981	270.5
Hesse	9,204	146.9
Mecklenburg-Vorpommern	740	46.0
Lower Saxony	11,087	138.9
North Rhine-Westphalia	35,967	200.6
Rhineland-Palatinate	6,413	157.0
Saarland	2,684	271.0
Saxony	5,061	124.1
Saxony-Anhalt	1,668	75.5
Schleswig-Holstein	2,988	103.2
Thuringia	2,681	125.1
Summe	173,152	

Figure 1: Number and cumulative incidence (per 100,000 population) of the 173,152 electronically reported COVID-19 cases in Germany by county and federal state (15/05/2020, 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 (54,869 cases).

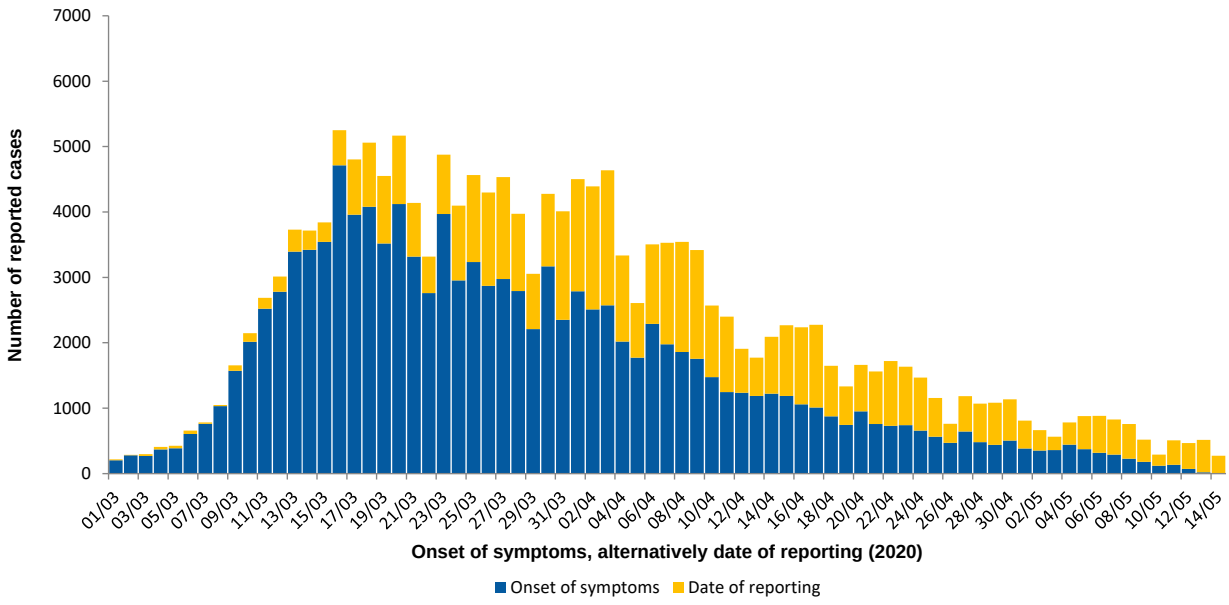


Figure 2: Number of electronically reported COVID-19 cases in Germany by date of symptom onset and by date of reporting from 01/03/2020 (15/05/2020, 12:00 AM).

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, 3,257 were children under 10 years of age (1.9%), 7,461 children and teenagers aged 10 to 19 years (4.3%), 74,481 persons aged 20 to 49 years (43%), 54,726 persons aged 50 to 69 years (32%), 28,144 persons aged 70 to 89 years (16%) and 4,956 persons aged 90 years and older (2.9%). The age is unknown in 127 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).

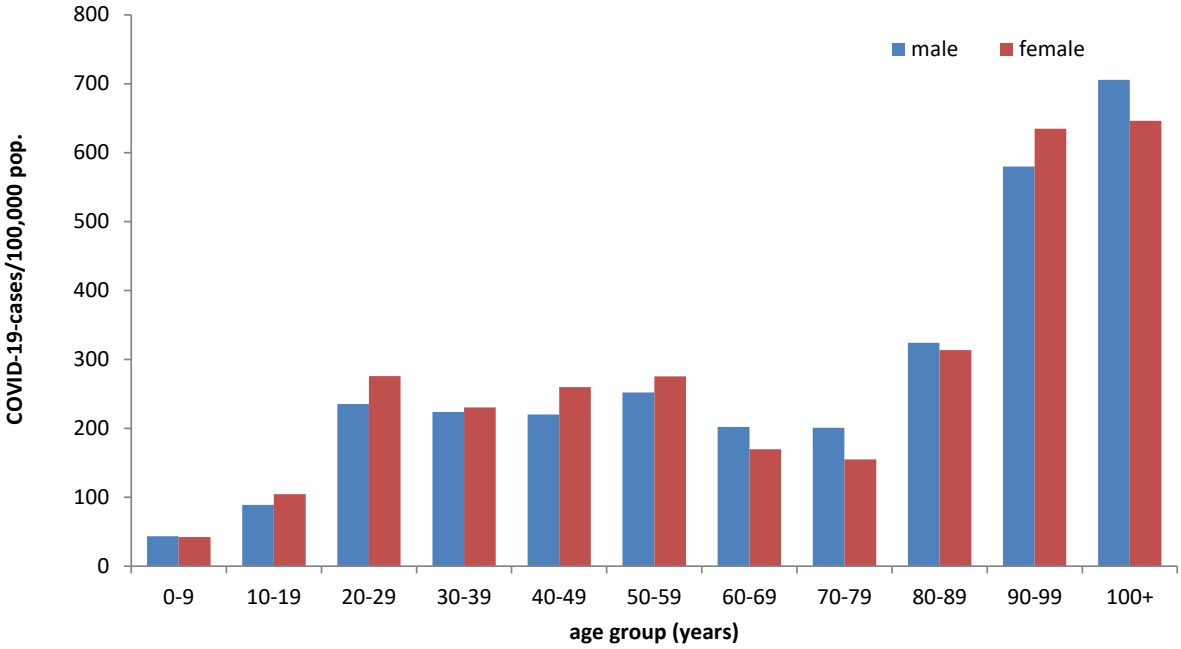


Figure 3: Electronically reported COVID-19 cases/100,000 population in Germany by age group and gender (n=172,658) for cases with information available (15/05/2020, 12:00 AM).

Clinical aspects

Information on symptoms is available for 144,221 (83%) of the notified cases. Common symptoms are cough (50%), fever (41%) and rhinorrhoea (21%). Pneumonia was reported in 4,189 cases (2.9%). Hospitalisation was reported for 25,591 (18%) of 144,004 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 1,259 of 8,469 cases (15%) recorded in the COVID-19 category.

Approximately 151,700 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, 7,824 COVID-19-related deaths have been reported in Germany (4.5% of all confirmed cases). Of these, 4,347 (56%) are men and 3,472 (44%) are women (see Table 2; gender was unknown in five cases). The median age was 82 years. Of all deaths, 6,754 (86%) were in people aged 70 years or older, but only 19% of all cases were in this age group. COVID-19 outbreaks continue to be reported in nursing homes and hospitals. In some of these outbreaks, the number of deaths is relatively high. 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.

Table 2: Number of notified COVID-19 deaths by age group and gender (Data available for 7,819 of notified deaths; 15/05/2020, 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	0	2	6	13	40	199	534	1,181	1,861	506	5
Female	1	0	2	6	14	66	185	570	1,668	917	43
Total	**1**	**2**	**8**	**19**	**54**	**265**	**719**	**1,751**	**3,529**	**1,423**	**48**

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 (172,238* cases, no data available for 53,796 cases; 15/05/2020, 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	2,669	1,836	499	1,700
	Occupation in facility	11,688	534	18	11,000
§ 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	1,907*	53	1	1,800
	Occupation in facility	2,273	107	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	14,470	3,284	2,919	9,700
	Occupation in facility	8,418	348	41	7,700
§ 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	1,984	131	55	1,300
Neither cared for, accommodated in nor working in a facility		75,033	13,580	2,946	68,400

*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

Until now, 11,688 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.

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.

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.

The reproduction number, R, is defined as the mean number of people infected by a case. 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 new cases and can indicate possible changes in trend. 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 in the case of a small number of new cases. 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 ended on the 10th of May 2020, so no reliable statement can be made about the number of new cases in the last 3 days.

The previously reported sensitive R-value can be estimated by using a moving 4-day average of the number of new cases estimated by nowcasting. It then compares the 4-day average value of the new cases on one day with the corresponding average value four days before. Because the new cases were infected 4 to 6 days before onset of illness, this means that they ocurred 8 to 13 days ago. The previous R-value, which is reported today, thus, maps the infection events occurring approximately one to two weeks ago. The current estimate is R= 0.80 (95% prediction interval: 0.67 – 0.97) and is based on electronically notified cases as of 15/05/2020, 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. Because the cases were infected 4 to 6 days before onset of illness, this means they ocurred 8 to 16 days ago. The 7-day R thus maps the

infection events of about one to a little more than two weeks ago. The 7-day R-value is estimated at 0.90 (95% predictation interval: 0.83 - 0.98) and is based on electronically notified cases as of 15/05/2020, 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)

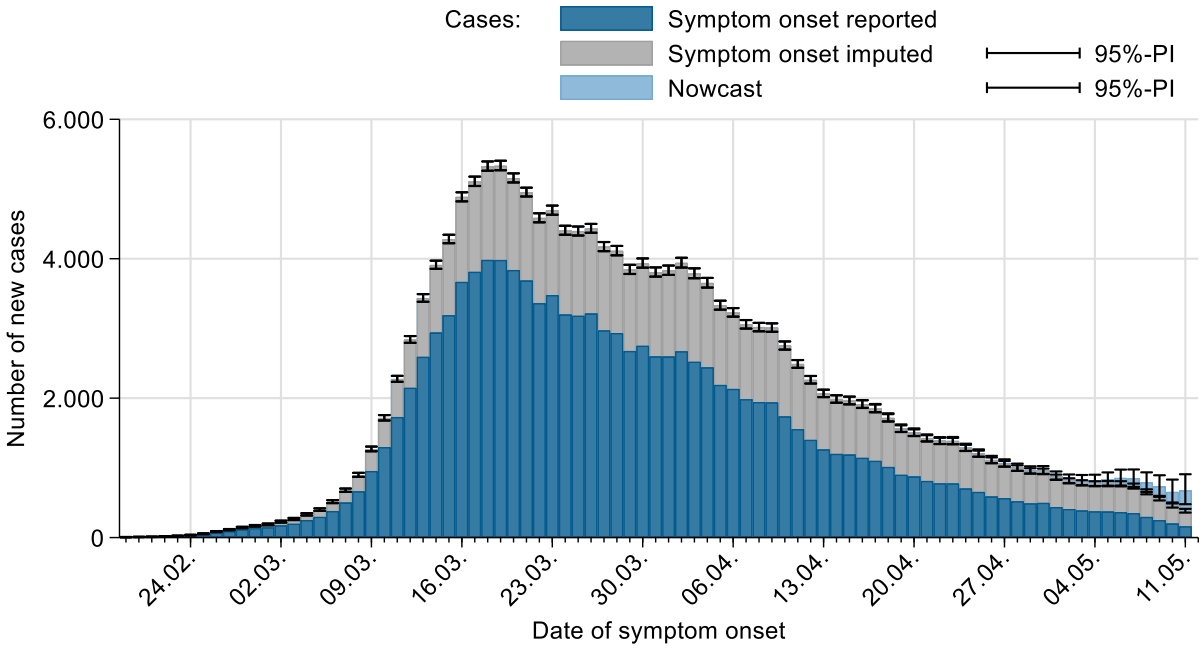


Figure 4: Display of cases with known onset of the disease (dark blue), estimated onset of the disease for cases where the onset of the disease has not beed reported (grey) and estimated course of already symptomatic cases (light blue) (as of 15/05/2020 12 AM, taking into account cases up to 10/05/2020).

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 15/05/2020, a total of 1,270 hospitals or departments reported to the DIVI registry. Overall, 32,464 intensive care beds were registered, of which 20,388 (63%) are occupied, and 12,076 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 (15/05/2020, 9:15 AM).

	Number of patients	Percentage	Change to previous day
Currently in ICU	1,294		-35
- of these: mechanically ventilated	838	65%	-54
Discharged from ICU	12,076		+483
- of these: deaths	3,475	29%	+306

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

Mortality surveillance

A total of 24 European countries provide the European EuroMOMO project (European monitoring of excess mortality for public health action) with official mortality data on a weekly basis. This allows for the recording and monitoring of excess mortality (regardless of the cause of death) (https://www.euromomo.eu/). In Germany, only regional systems have been established so far (since 2007 in Berlin and Hesse). The establishment of a nationwide monitoring system is planned from 2021 onwards. Daily mortality figures are also recorded on the website of the Federal Statistical Office, albeit with a certain time lag (data status 30/04/2020). A special evaluation on excess mortality is updated every two weeks:
https://www.destatis.de/DE/Themen/Querschnitt/Corona/Gesellschaft/bevoelkerung-sterbefaelle.html *(in German)*

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*)

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