

CORRESPONDENCE

Research Letter

The Effects of the COVID-19 Pandemic and Lockdown on Routine Hospital Care for Other Illnesses

The COVID-19 pandemic continues to present enormous challenges to all healthcare systems. The number of patients with COVID-19 per se, as well as the measures taken to contain and control the pandemic have had far-reaching consequences for patient care. Reports from all parts of the world have confirmed a clear reduction in the numbers of medical emergencies seen in hospitals. We report on the extent of the altered healthcare reality in 310 hospitals of the Quality Medicine Initiative (*Initiative Qualitätsmedizin—IQM*) during the lockdown.

Method

We analyzed claims data from 310 IQM hospitals, which made their data available on a voluntary basis immediately after the

study period. The data were worked up by 3M in accordance with routine practice in the IQM, adhering to the current version of the German In-Patient Quality Indicators (GIQI) from the hospitals' billing datasets according to §21 of Germany's Hospital Reimbursement Act (*Krankenhausentgeltgesetz, KHEntgG*), which contains structured data on the International Classification of Diseases (ICD), the German coding system for operations and procedures (*Operationen- und Prozedurenschlüssel, OPS*), age, sex, and reason for admission/discharge (1, 2).

Furthermore, we evaluated the codes U07.1 for COVID-19 with confirmed SARS-CoV-2 and U07.2 for clinically suspected COVID-19 without confirmation of the virus.

TABLE

Case numbers and mean inpatient length of stay (LOS) in days for the different study periods*

	13 March – 19 April 2019		13 March – 19 April 2020		
	Case no.	Ø LOS days	Case no.	Ø LOS days	
Total	514 284	5.8	294 622	5.0	57.3 %
01.1 – Myocardial infarction (MI)	6491	7.2	4292	5.5	66.1 %
03.11 – Coronary artery catheterization in MI	5170	6.9	3567	5.3	69.0 %
03.121 – Coronary artery catheterization WITHOUT MI	12 198	5.5	6202	4.5	50.8 %
04.1 – Cardiac arrhythmia	14 138	4.1	7240	3.6	51.2 %
05.1 – Pacemaker	4043	7.8	2490	5.5	61.6 %
06.1 – Catheter ablation	2983	3.7	1335	3.7	44.8 %
07.1 – Cardiac surgery	3762	14.3	2162	10.6	57.5 %
09.1 – Stroke	8360	10.5	5981	7.4	71.5 %
10.1 – Transient ischemic attack (TIA)	2939	4.5	1859	3.8	63.3 %
11.1 – Epilepsy	3442	5.9	2183	4.5	63.4 %
13.1 – Geriatric early rehabilitation	8975	21.5	2961	19.2	33.0 %
14.1 – Pneumonia	11 061	8.8	10 572	8.4	95.6 %
15.1 – Chronic obstructive pulmonary disease	6695	7.9	2946	6.9	44.0 %
16.1 – Lung cancer, inpatient treatment	5705	7.3	3949	5.7	69.2 %
17.1.1 – Lung/bronchial resection	958	13.5	695	9.8	72.5 %
18.1 – Cholecystectomy in gallstones	4140	4.6	2064	4.7	49.9 %
19.1 – Herniotomy without visceral surgery	5679	2.2	1447	2.2	25.5 %
20.1 – Thyroid resection	1417	3.8	498	3.4	35.1 %
21.1 – Colorectal cancer	3964	9.8	2528	7.1	63.8 %
21.3 – Colorectal resection	2968	18.0	1607	12.3	54.1 %
22.1 – Stomach cancer, inpatient treatment	1203	8.3	822	6.1	68.3 %
24.1 – Complex esophageal interventions	100	31.6	59	17.9	59.0 %
25.1 – Pancreatic interventions	335	27.1	195	15.8	58.2 %
27.1 – Aortic interventions	764	14.0	404	9.7	52.9 %
28.1 – Surgery of the pelvic/leg arteries	2087	16.5	1004	11.2	48.1 %
32.1 – Birth	18 909	3.9	17 330	3.3	91.6 %
37.1 – Breast cancer	3884	5.2	2958	4.4	76.2 %
38.1 – Breast resection and reconstruction	3390	4.3	2447	4.0	72.2 %
41.1 – Hip endoprosthesis - first-time implant	4401	8.9	955	7.6	21.7 %
43.1 – Knee endoprosthesis - first-time implant	4305	8.5	711	7.6	16.5 %
46.1 – Neck of femur fracture	2012	13.9	1527	11.1	75.9 %
46.2 – Pertrochanteric femoral fractures	1781	14.4	1445	10.9	81.1 %
47.1 – Spinal/spinal cord surgery	8788	10.0	4023	7.7	45.8 %
49.1 – Polytrauma	533	21.1	352	11.2	66.0 %
51.1 – Bladder malignancy	3526	5.4	2686	4.5	76.2 %
53.1 – Prostate cancer	2659	6.2	1858	5.5	69.9 %
56.1 – Mechanical ventilation >24 hours	6926	23.2	4425	13.3	63.9 %
57.1 – Sepsis (HD)	4095	11.3	1712	9.0	41.8 %

* Percentage changes relate to the comparison with the same period in the preceding year. The individual indicators are representative indicators taken from the default GIQI of the IQM (1, 2). The numbering of the indicators was maintained in accordance with the valid IQM handbook of definitions; concrete inclusions and exclusions are listed there.

3M also acts as data trustee/custodian and interpretation center in the standard interpretation of data from IQM hospitals, which means that all aspects of data protection are ensured by 3M for the present analysis. All participating hospitals receive the analysis that is pertinent to them and have consented to the use of the aggregated data.

In Germany in the time period from 1 January 2020 to 12 March 2020 no restrictions had been imposed on public life, whereas from 13 March 2020 to 19 April 2020 a multitude of regulations restricted public life and routine healthcare services in order to contain the pandemic. These two periods were each compared with the corresponding periods in the previous year. Percentages relate to case numbers in 2020 compared with the relevant period in 2019.

Results

Our analysis includes 310 IQM hospitals with 1 283 190 inpatients in the year up to 19 April 2020. The following hospitals run by different organizations participated (the numbers of patients included are listed in parentheses): 12 university hospitals (158 282), 50 non-profit hospitals (165 458), 103 public service hospitals (460 201), and 145 private hospitals (499 249). Apart from the 12 university hospitals, the care levels were: 25 specialist hospitals (25 672), 238 hospitals providing basic and standard care (797 840), and 35 hospitals providing maximum care (301 396).

During the study period, 16 614 patients with COVID-19 were treated, in whom confirmed viral infection was coded in 5837 and clinically suspected COVID-19 in 10 777.

In the time before the lockdown, the number of cases in 2020 was hardly any different to the same period of 2019 (985 491 versus 990 153). The table shows case numbers and length of inpatient stay of patients for the lockdown period compared with the previous year, with selected relevant and representative GIQI indicators listed. During the lockdown, hospital cases in 2020 were 57.3% of those of the same period in the previous year. To point out a limitation: a few hospitals that admitted many patients with COVID-19 ceased admissions of non-COVID patients.

Discussion

The present analysis of routine data shows the extent of the COVID-19 pandemic in a number of hospitals run by different organizations and across different care levels.

During the lockdown period, numbers of patients across all care services provided on an inpatient basis fell substantially. This observation is self explanatory for elective medical procedures as relevant regulations had been introduced. However, the notable reduction in emergency procedures—for example, for myocardial infarction or stroke—and time critical interventions in oncology is not self-explanatory. This phenomenon has also been described for other parts of the world, and the assumption is that many patients avoid seeking out healthcare even in emergencies because of a fear of infection. According to reports from

California, resuscitation attempts outside the hospital setting have increased notably because emergency patients set the rescue chain in motion too late (3). It is also possible that because of the contact restrictions the incidence of emergency cases fell because other infectious diseases or other triggers of cardiac, circulatory, or pulmonary disorders were less common. Similarly, diagnostic evaluations that were not carried out because of closed practices and hospital areas may have resulted in fewer admissions even for urgent indications. Healthcare researchers will need to analyze the precise reasons for and consequences of this observation for healthcare quality as a whole. We are fully aware that the present analysis of 310 IQM hospitals is not representative for the healthcare situation in the whole of Germany as this would require the analysis of claims data from all hospitals. This research letter shows, however, that routine data can be used to analyze what is happening in healthcare services in a reliable manner and in a timely fashion so as to provide further direction for pandemic control measures.

What is striking is that the coding was based on confirmed viral infection in only 36% of inpatients with COVID-19. Even if confirmed cases of COVID-19 with nasopharyngeal swabs testing negative on polymerase chain reaction have been described in up to 30% (4), the likely reason for this is that COVID coding has thus far not been handled in a consistent and uniform manner. This finding will have to be analyzed in detail before reliable COVID-19 analyses can be undertaken using routine data. Since such analyses would exceed the scope of the research letter format we will report on this separately.

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Conflict of interest statement

Jens Schick has personal relations with Sana Kliniken AG, a private healthcare provider. The remaining authors declare that no conflict of interest exists.

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