

CORRESPONDENCE

Research Letter

Differences in COVID-19 Risk Between Occupational Groups and Employment Sectors in Germany

In employees in the health service and welfare work/nursing care sectors who are exposed to a significantly higher risk of infection compared to the general population as a result of their work activity, coronavirus disease 2019 (COVID-19) can be recognized as an occupational disease (OD) (1). However, the question arises as to whether increased risks of infection also exist in occupational groups other than those listed in the OD number 3101 information sheet (Box).

BOX

Definition of the occupational disease (OD) 3101

According to the list of occupational diseases annexed to the German Ordinance on Occupational Diseases, the OD 3101 covers “infectious diseases if the insured person works in the health service and welfare work sectors or in a laboratory or is to a similar extent particularly exposed to a risk of infection by another activity.” (1)

Methods

Based on the routine data of the German health insurance fund BARMER GEK for all employed insured persons aged between 15 and <65 years, age- and sex-specific COVID-19 incidence rates were calculated for the period from 1 January 2020 to 31 May 2020 (data as of: 15 June 2020). A person was counted as a COVID-19 case if one of the following ICD-10 diagnoses were recorded on the certificate of incapacity for work (“sick note”) or as a hospital diagnosis: U07.1, U07.2, U04.9, B34.2, and B97.2 (2). Given the higher level of validity of hospital diagnoses, a second analysis based solely on hospital diagnoses was performed.

The information about employment sector and occupation were obtained from the coded social security data (3). Analyses were performed on standardized incidence ratios (SIR) by employment sectors and occupational groups as well as by risk groups, using the grouping system proposed by the Collegium Ramazzini (4) which is based on the likelihood of occupational contact with an infected person. The risk groups 1 and 2 include occupations classed as „high risk” or “very high risk“. Those occupations covered by the OD 3101 definition were classified as risk group 3. All other employees were classified as risk group 0. Risk groups allocation considered only those combinations of employment sector and occupation in which, to our knowledge, people were working during the lockdown.

Results

Among the more than 4.1 million insured persons, altogether 15 167 cases of COVID-19 were identified of which 2890 were hospitalized (19.1 %). The ICD-10 codes U07.1 and U07.2, which have been applicable since April 2020, accounted for more than 90% of the diagnoses.

Taking into account the sick notes, women were nearly 40% more frequently diagnosed with COVID-19 than men. The frequency of severe disease requiring hospitalization increased in men with increasing age but not in women (Table 1).

TABLE 1

Cumulative incidence (1 January 2020–31 May 2020) of employees for COVID-19 by age and sex per 100 000 persons

Age group (years)	Diagnosis based on			
	Sick note/hospital		Hospital	
	Women	Men	Women	Men
15–19	481.6	367.2	72.0	32.6
20–24	417.7	291.9	47.9	36.0
25–29	347.2	233.8	54.7	44.3
30–34	308.4	228.6	61.7	39.6
35–39	353.2	248.5	64.2	47.6
40–44	403.8	263.5	66.6	55.4
45–49	496.4	302.1	66.9	67.0
50–54	474.3	349.0	66.5	91.7
55–59	480.4	403.6	71.0	124.0
60–64	426.9	410.0	89.9	146.3
15–64	419.6	304.1	67.1	72.4

The analysis by risk groups, created according to the classification of the Collegium Ramazzini, showed that among the OD 3101-relevant occupations the risks with regard to COVID-19 were highest for occupations in healthcare institutions and in the social welfare work/nursing care sector (Table 2). Likewise, in risk group 2, a significantly increased risk was found with SIR = 1.34 (95% confidence interval: [1.15; 1.55]). The SIRs in the subgroups showed great heterogeneity. The highest risks were found among persons with temporary employment through agencies as well as employees in the postal services and logistics sectors. More than half of the cases of disease among temporary employees were found in the postal services and logistics sectors.

An intra-sectoral comparison in hospitals and nursing care facilities found an increased disease risk among employees with frequent face-to-face contacts with patients or persons in need of nursing care compared to the remaining employees in this sector. In the hospital sector, the corresponding SIRs were calculated, based on hospital diagnoses, to be 2.10 [1.82; 2.41] and 1.40 [1.08; 1.79], respectively, and in the sector of nursing care for the elderly to be 1.95 [1.47; 2.54] and 1.18 [0.94; 1.48], respectively.

TABLE 2

Standardized incidence ratios for COVID-19 for specific risk groups

Risk group	Diagnosis based on					
	Sick note/hospital			Hospital		
	No. of cases	SIR	[95% CI]	No. of cases	SIR	[95% CI]
Risk group 1 (high risk)	200	1.16	[1.00; 1.33]	43	1.09	[0.79; 1.47]
Risk group 2 (very high risk)	661	0.96	[0.89; 1.03]	173	1.34	[1.15; 1.55]
Risk group 3 (OD 3101)	2863	2.40	[2.31; 2.49]	376	1.80	[1.62; 1.99]
Subgroups						
Employees in food production	55	0.99	[0.75; 1.29]	10	0.89	[0.43; 1.64]
Employees in the energy/water/waste water, cleaning sectors	136	0.86	[0.72; 1.02]	33	1.01	[0.69; 1.41]
Sale of food, beverages, drugstore products, etc.	323	0.94	[0.84; 1.05]	58	0.98	[0.74; 1.27]
Staff in local public transport and inter-city rail services	45	1.33	[0.97; 1.78]	9	1.09	[0.50; 2.06]
Employees in the postal services and logistics sectors	122	1.14	[0.95; 1.36]	33	1.53	[1.05; 2.15]
Security services, law enforcement services	101	1.42	[1.15; 1.72]	29	1.75	[1.17; 2.51]
Employees with patient contact in hospitals, medical practices	2260	2.38	[2.28; 2.48]	291	1.75	[1.56; 1.97]
Employees in the sector of providing and caring for the elderly	603	2.49	[2.29; 2.69]	85	2.00	[1.59; 2.47]
Employees in temporary agency work in the production/logistics sectors	79	0.84	[0.67; 1.05]	44	2.30	[1.67; 3.08]

OD, occupational disease; CI, confidence interval; SIR, standardized incidence ratio

Discussion

Our analysis showed that the risk of developing COVID-19 is highest in occupations in which employees have frequent face-to-face contacts with COVID-19 patients or potentially infected persons during their occupational activities. However, increased risks of disease were also observed in occupations with presumably cramped workplaces and suboptimal hygienic conditions. The high risks of disease among persons with temporary employment through agencies, calculated on the basis of hospital data, was particularly striking. In addition, the hospitalization rate among these temporary employees was with 55.7% almost three times as high as the average of all employed insured persons of BARMER in the age group 15 to <65 years. It would also be possible that there were more persons in this group who developed COVID-19, but were not seeking medical care for fear of losing their job.

The analysis did not yield any evidence that COVID-19 cases occurred in increased numbers, for example, in supermarkets or among local public transport staff. The occupational safety measures taken in these sectors were obviously adequate.

The interpretation of the results of our study should be primarily based on the analysis of hospital data. The fact that doctors were allowed to issue a certificate of incapacity for work after taking a patient’s medical history over the phone in the period from 9 March 2020 to 31 May 2020, but also the lack of test capacities during the first weeks of the pandemic, suggest that the validity of the sick note diagnoses was significantly lower compared to that of the hospital diagnoses. It should also be noted that persons insured with a statutory health insurance fund do not represent a random sample of the population. Doctors, for example, are underrepresented in this sample.

In order to reduce the risk of disease in the future, the new German SARS-CoV-2 Occupational Safety and Health Standard (5) must be implemented and stricter monitoring of compliance with the internal measures based on it must be ensured.

Matthias Möhner, Andreas Wolik

Fachbereich Arbeit und Gesundheit, Bundesanstalt für Arbeitsschutz und Arbeitsmedizin, Berlin, Germany (Möhner), Moehner.Matthias@baua.bund.de
 Institut für Gesundheitssystemforschung, BARMER Hauptverwaltung, Wuppertal, Germany (Wolik)

Conflict of interest

Andreas Wolik is an employee of the BARMER Institute for Health System Research (Institut für Gesundheitssystemforschung)..
 Matthias Möhner declares no conflict of interest.

Manuscript received on 14 July 2020; revised version accepted on 31 August 2020

Translated from the original German by Ralf Thoene, MD.

References

1. Bundesministerium für Arbeit: Bekanntmachung vom 1. 12. 2000: Merkblatt zur BK Nr. 3101: BARbBl 2001; 1/2001: 35.
2. BARMER: Raten der AU-Diagnosen akuter Atemwegserkrankungen bei BARMER-Versicherten. BARMER Institut für Gesundheitssystemforschung 2020. <https://www.bifg.de/daten-und-analysen/sonderanalysen/arbeitsunfaehigkeiten-atemwegserkrankungen-raten> (last accessed on 1 September 2020).
3. Bundesagentur für Arbeit (eds.): Klassifikation der Berufe 2010. Nürnberg: Bundesagentur für Arbeit; 2011.
4. Fellows of the Collegium Ramazzini: 24th Collegium Ramazzini Statement: Prevention of work-related infection in the COVID-19 pandemic. J Int J Occup Environ Med 2020; 62: e467–8.
5. Bundesministerium für Arbeit und Soziales: SARS-CoV-2-Arbeitsschutzregel. GMBI 2020: 484–95.

Cite this as:

Möhner M, Wolik A: Differences in COVID-19 risk between occupational groups and employment sectors in Germany. Dtsch Arztebl Int 2020; 117: 641–2.
 DOI: 10.3238/arztebl.2020.0641