

Monitoring Belgian COVID-19 infections in work sectors in 2022

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1 Introduction

The workplace is among the main activities for a large proportion of the population, and consequently a source of potential infection. Hence, it is often (up to 25%) reported in the contact centre database as one of the collectivities visited by the index case. It is important to monitor the incidence of COVID-19 by sector as it can help us to better understand causes of increased infection rates and it can offer us ways to reduce infections without jeopardising the continuity of these sectors/companies for the benefit of all, first and foremost the companies and their workers. In contrary to previous reports only one source of information on infection in work sectors will be used: the RSZ/ONSS data. Due to changed policy concerning testing and contact tracing in March 2022, insufficient incidence data is available from the IDEWE contact tracing.

1.1 RSZ/ONSS data

The RSZ/ONSS data analyses of COVID-19 infections in the working population were set up in the first place to allow for signal detection. The alerts consist of 2 or more cases in the same company as well as the identification of employment of an index case in a risk sector as defined by the regional contact tracing agencies (daily alerts are sent by the RSZ/ONSS to the regions). Aggregated data show the evolution over time of the incidence in the sectors. It helps to better understand the spread of the virus in the active population. The latter is of interest here.

Data description: RSZ-ONSS has been receiving information regarding positive COVID-19 cases from Sciensano since 8 September 2020. RSZ-ONSS links this information to workplace-related databases, at the level of the national number (NISS). The linkage is allowed during a period of 14 days, after which the information on positive cases is destroyed, while the aggregated output tables are stored. Linkage is done of positive cases with the NSSO Dimona database of active workers since 8 September 2020. This covers most of the workers, such as private and public sectors, interim employment and job students. Since 12 January 2021, additional linkage of positive cases with the ARZA-RGTI (Algemeen Repertorium van de Zelfstandige Arbeiders - Répertoire Général des Travailleurs Indépendants) database was allowed, which covers self-employed workers.

Each company is classified by sector of its main activity (as attributed by the RSZ-ONSS), which are identified by the NACE code. This standard code classifies workplaces into 21 main sectors and then in subcategories for which the specificity depends on the chosen granularity (which can have up to 943 subcategories). However, although some companies or self-employed workers may be active in more than one sector, only one NACE number associated with the main activity is used in the analysis. This limitation is particularly important to consider for employees within national education. Because a vast majority of schools provide both primary and secondary education, the employees will be registered as working in “Secondary education” even when in reality they are primary school teachers.

Further, since the link of the cases is only identified at the level of the company, no information is available on the type of the job of the index case (e.g., administrative work in metal industry will be registered under metal industry). Further, information on the exact employment location is not always available and/or accurate (e.g., information on telework or temporary unemployment is not available).

Finally, the actual source of infection (in particular: at the workplace or elsewhere) cannot be traced back from this database. Thus, the size and extent of the database allows us to obtain a clear and precise picture of the level of infection within a given sector, without link to the source and circumstances of infection.

2 Methodology

2.1 COVID-19 14-day incidence

The data provided by RSZ/ONSS will be shown per work sector. Work sectors are divided by NACE codes and grouped into 5 levels of detail, going from 21 sectors at level 1 to 943 sectors at level 5. The evolution of the 14-day incidence of positive COVID-19 cases among all employees registered in the same sector (number of cases per 100,000 employees) is presented for the 5 levels of work sectors. A 95% confidence interval (CI)

for the incidence is calculated on a logit transformation of the incidence, after which it is backtransformed to the original scale.

At each of the 5 levels of detail of the work sectors, the highest incidences in the last 14-day period are selected (6 – 19 December 2022) and presented together with the COVID-19 14-day incidence over all work sectors (~ 4.5 million individuals) and the COVID-19 14-day incidence in the general population (~ 11.5 million individuals) for reference.

Because the number of employees in some occupational sectors is low compared to others, the precision of the 14-day incidence is low in such small sectors. Therefore, we select the highest incidences for level 1 sectors with a minimum of 10,000 employees and self-employed workers. For level 2 and 3 sectors with a minimum of 5,000 employees and self-employed workers are selected, while for level 4 and level 5, sectors with a minimum of 3,000 and 1,500 employees, respectively, are selected.

Note that for 25% of the self-employed a sector is missing in the ARZA-RGTI data. Positive cases of self-employed worker with missing sector information are left out of the analysis. Linkage to occupational data shows that missing sector information is dispersed over many sectors, so that the impact of missing data is not affecting a single sector excessively. There will be a slight underestimation of the true incidence, but the ordering among sectors is likely not affected.

Finally, we cannot exclude varying testing preparedness and custom between sectors.

3 Results

This report is accompanied with an Excel sheet, listing all sectors and all NACE-BEL sectors for further examination.

3.1 Level 1 work sector

Of the 20 sectors at level 1, the sectors with a 14-day incidence on 19 December 2022 significantly above the working population average is Human health and social work activities (sector Q) (Table 1 and Figure 1). The 14-day incidences is plateauing in most sectors, except for the Human health and social work activities. The working population average is 27% smaller then the general population average.

14-day incidence of employees and self-employed at level 1

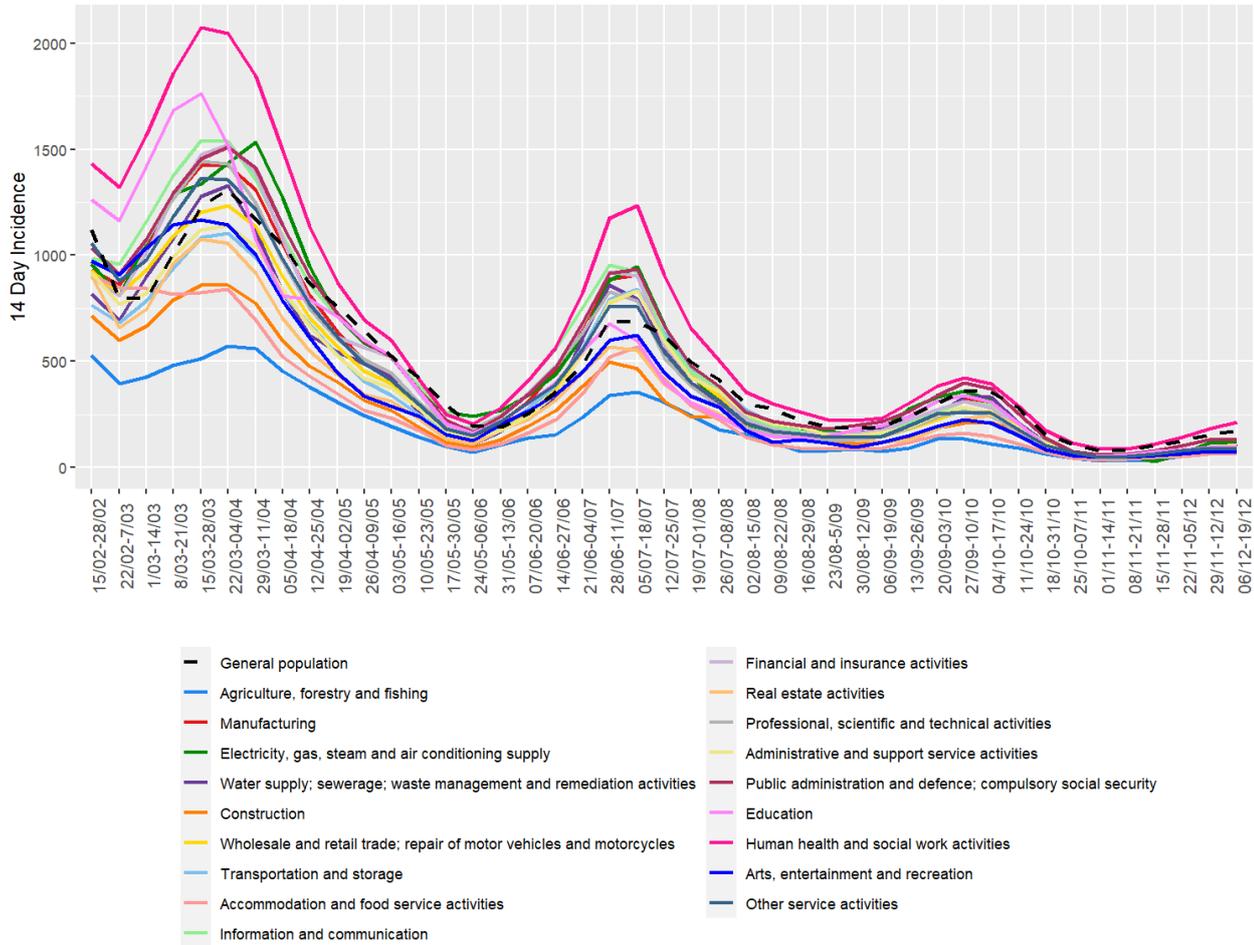


Figure 1: 14-Day incidence of COVID-19 infection of 20 sectors at Level 1 in both employees and self-employed workers

Table 1: 14-Day incidence of COVID-19 infection of 20 sectors at Level 1 on 19 December 2022

DESCRIPTION	NACE-code	Total number of workers	Incidence (95%CI) all workers	Incidence (95%CI) employees	Incidence (95%CI) self-employed	Percentage of self-employed workers
Human health and social work activities	Q	675701	214(203;225)	222(211;234)	123(97;157)	8.17
General population			171	171	171	
Public administration and defence; compulsory social security	O	554962	131(122;141)	131(122;141)		0.19
Working population		4660800	125(122;128)	125(122;128)		
Electricity, gas, steam and air conditioning supply	D	21239	113(76;169)	115(76;173)		6.17
Water supply; sewerage; waste management and remediation activities	E	40541	111(83;149)	107(79;145)		5.84
Administrative and support service activities	N	442857	105(96;115)	113(103;124)	66(50;87)	18.28
Transportation and storage	H	323077	104(93;116)	107(96;119)	74(48;113)	9.01
Education	P	709278	97(90;105)	98(91;106)	69(43;109)	3.82
Financial and insurance activities	K	158333	96(82;113)	110(93;130)	46(28;75)	22.36
Manufacturing	C	629474	95(88;103)	99(91;108)	60(44;82)	10.42
Wholesale and retail trade; repair of motor vehicles and motorcycles	G	845556	90(84;97)	96(89;104)	71(60;84)	22.77
Other service activities	S	159770	87(74;103)	92(73;115)	81(63;104)	49.59
Construction	F	384884	86(77;96)	100(88;114)	66(54;80)	40.89
Real estate activities	L	58750	80(60;106)	108(74;157)	59(38;91)	58.33
Professional, scientific and technical activities	M	406250	80(72;89)	92(80;106)	66(55;79)	46.36
Information and communication	J	192308	78(66;92)	84(70;101)	64(46;89)	29.21
Arts, entertainment and recreation	R	115068	73(59;90)	83(65;106)	55(36;84)	36.09
Accommodation and food service activities	I	339130	69(61;78)	73(63;84)	55(40;75)	22.19
Agriculture, forestry and fishing	A	82353	68(52;88)	57(35;92)	74(54;101)	64.99

3.2 Level 2 work sector

In the sectors at level 2 with a minimum of 5,000 workers, the sectors with a 14-day incidence on 19 December 2022 above the working population average are: Human health activities (sector 86) and Residential care activities (sector 87) (Table 2 and Figure 2).

14-Days incidence at Level 2 Employees and Self-employed

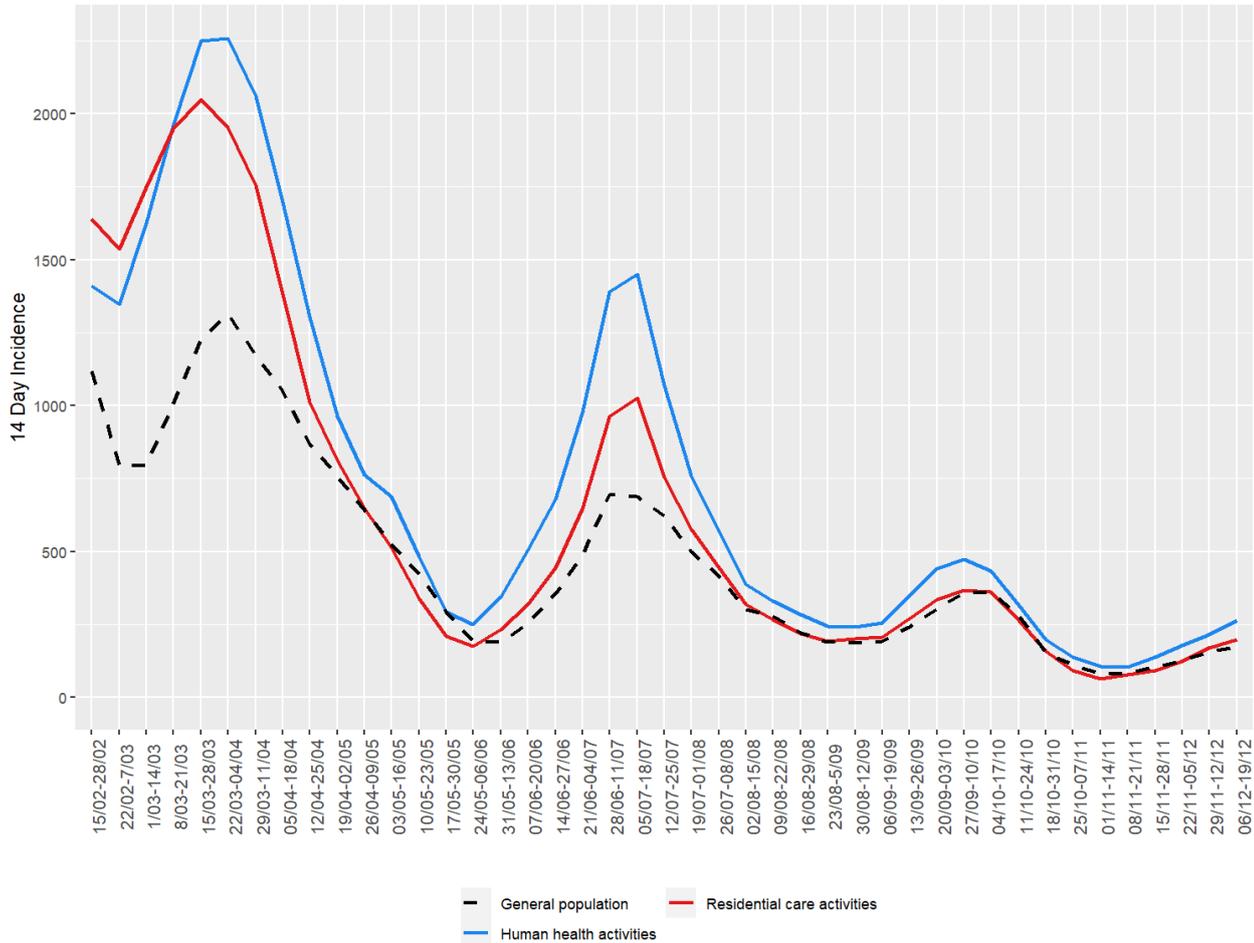


Figure 2: 14-Day incidence of COVID-19 infection in sectors with the highest incidence at Level 2 in both employees and self-employed workers

Table 2: 14-Day incidence of COVID-19 infection in sectors with the highest incidence at Level 2 on 19 December 2022

DESCRIPTION	NACE-code	Total number of workers	Incidence (95%CI) all workers	Incidence (95%CI) employees	Incidence (95%CI) self-employed	Percentage of self-employed workers
Human health activities	86	322433	263(246;281)	286(267;307)	128(99;165)	14.94
Residential care activities	87	182741	197(178;218)	198(179;220)	130(42;402)	1.29
General population			171	171	171	
Working population		4660800	125(122;128)	125(122;128)		

3.3 Level 3 work sector

In the sectors at level 3 with a minimum of 5,000 workers, the sectors with a 14-day incidence on 19 December 2022 significantly above the working population average are: Hospital activities (sector 861), Residential care activities (sector 873, 871), Construction of other civil engineering projects (sector 429), Other human health activities (sector 869), Social work activities without accommodation for the elderly and disabled (sector 881), Medical and dental practice activities (sector 862) and Administration of the State (sector 841) (Table 3 and Figure 3).

The incidences in education follow the trend in the working population except for the higher education, where incidences have been plateauing since the last 4 weeks. The incidences in the remaining education sectors attain incidences similar to or lower than the working population average (Figure 4). A comparison between primary and secondary schools is inaccurate based on the available data. Indeed, the NACE-BEL code for school employees is assigned to the main activity of the school. Hence, for schools offering both primary and secondary education, all employees are counted as secondary education employees. Employees under the NACE-BEL code primary education are employees in schools that offer only primary education.

14-Days incidence of top Level 3 Employees and Self-employed

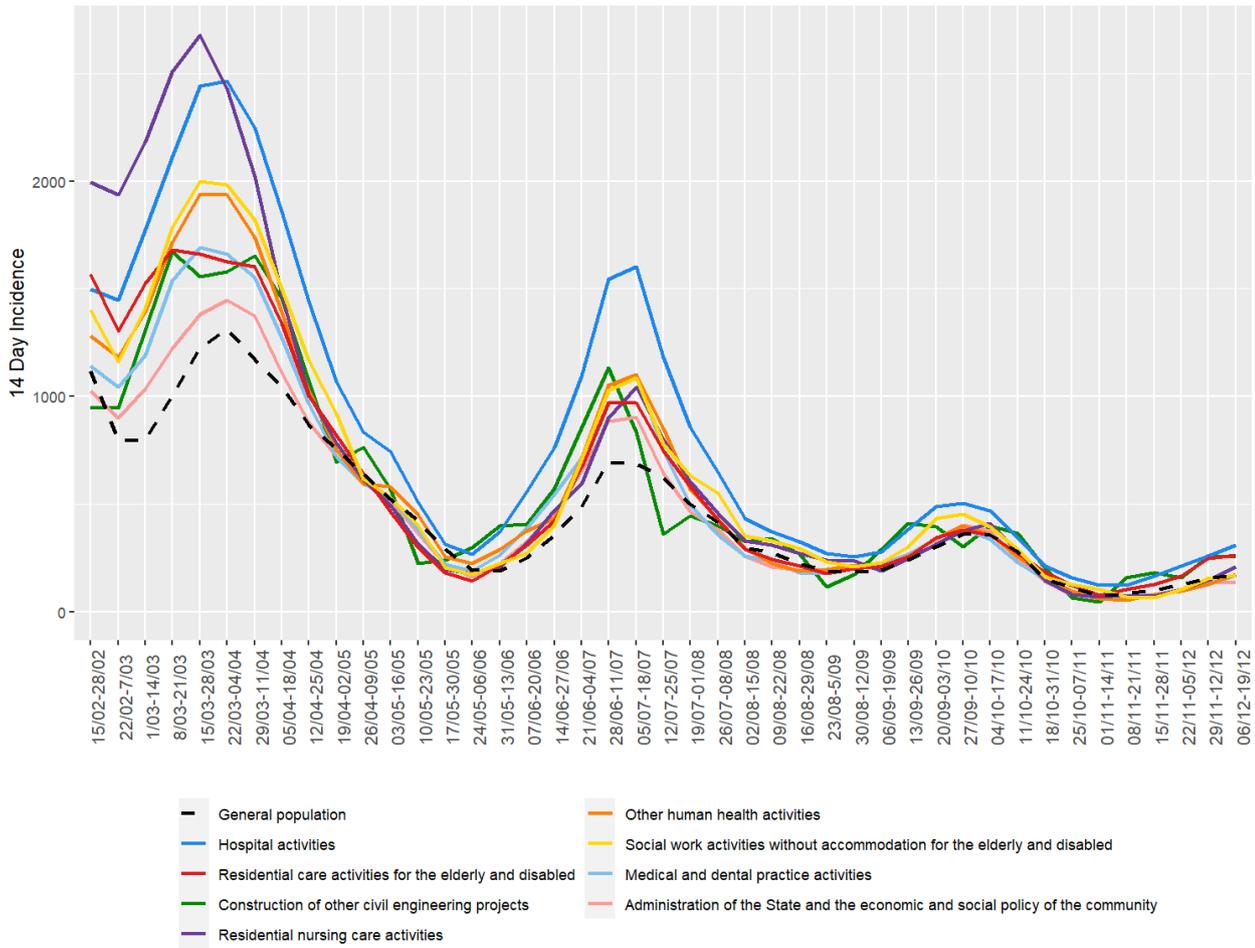


Figure 3: 14-Day incidence of COVID-19 infection in sectors with the highest incidence at Level 3 in both employees and self-employed

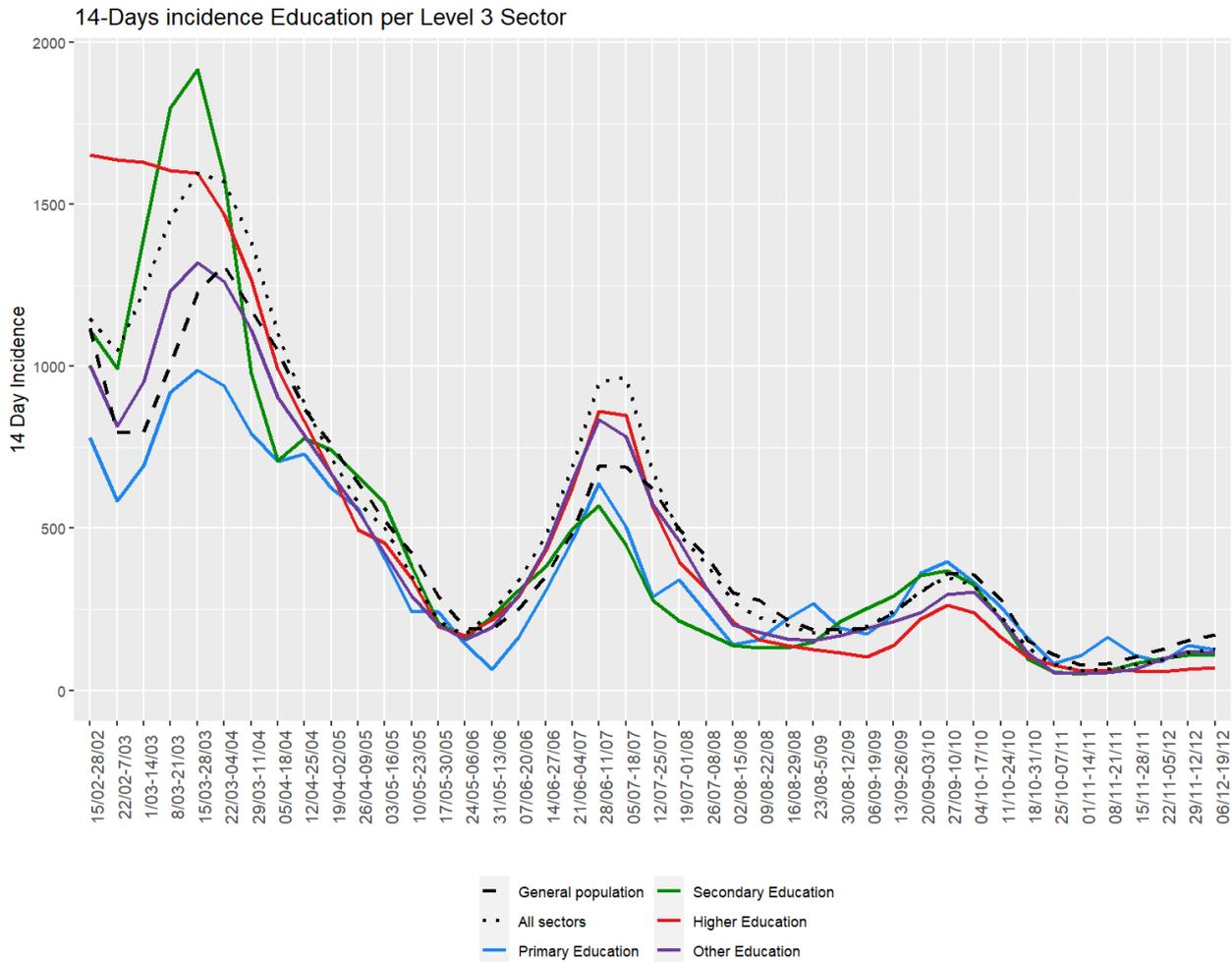


Figure 4: 14-Day incidence of COVID-19 infection in Education sectors at Level 3 in both employees and self-employed

Table 3: 14-Day incidence of COVID-19 infection in sectors with the highest incidence at Level 3 on 19 December 2022

DESCRIPTION	NACE-code	Total number of workers	Incidence (95%CI) all workers	Incidence (95%CI) employees	Incidence (95%CI) self-employed	Percentage of self-employed workers
Hospital activities	861	222903	310(288;334)	310(288;334)		0.32
Residential care activities for the elderly and disabled	873	68061	263(227;304)	263(227;305)		1.30
Construction of other civil engineering projects	429	6923	260(164;412)	270(168;434)		9.06
Residential nursing care activities	871	53333	210(175;253)	210(175;253)		0.76
Other human health activities	869	36782	174(136;222)	191(146;249)	117(63;217)	47.93
Social work activities without accommodation for the elderly and disabled	881	48538	171(138;212)	171(138;212)		1.09
General population			171	171	171	
Medical and dental practice activities	862	31953	169(129;221)	178(132;239)	139(75;258)	47.34
Administration of the State and the economic and social policy of the community	841	375887	141(129;154)	141(129;154)		0.17
Working population		4660800	125(122;128)	125(122;128)		

3.4 Level 4 work sector

In the sectors at level 4 with a minimum of 3,000 workers, the sectors with a 14-day incidence on 19 December 2022 significantly higher than the working population average are: Hospital activities (sector 8610), Construction of water projects (sector 4291), Residential care activities (sector 8730, 8710), General medical practice activities (sector 8621), Social work activities without accommodation for the elderly and disabled (sector 8810), Other human health activities (sector 8690) and General public administration activities (sector 8411) (Table 4 Figure 5).

14-Days incidence of top Level 4 Employees and Self-employed

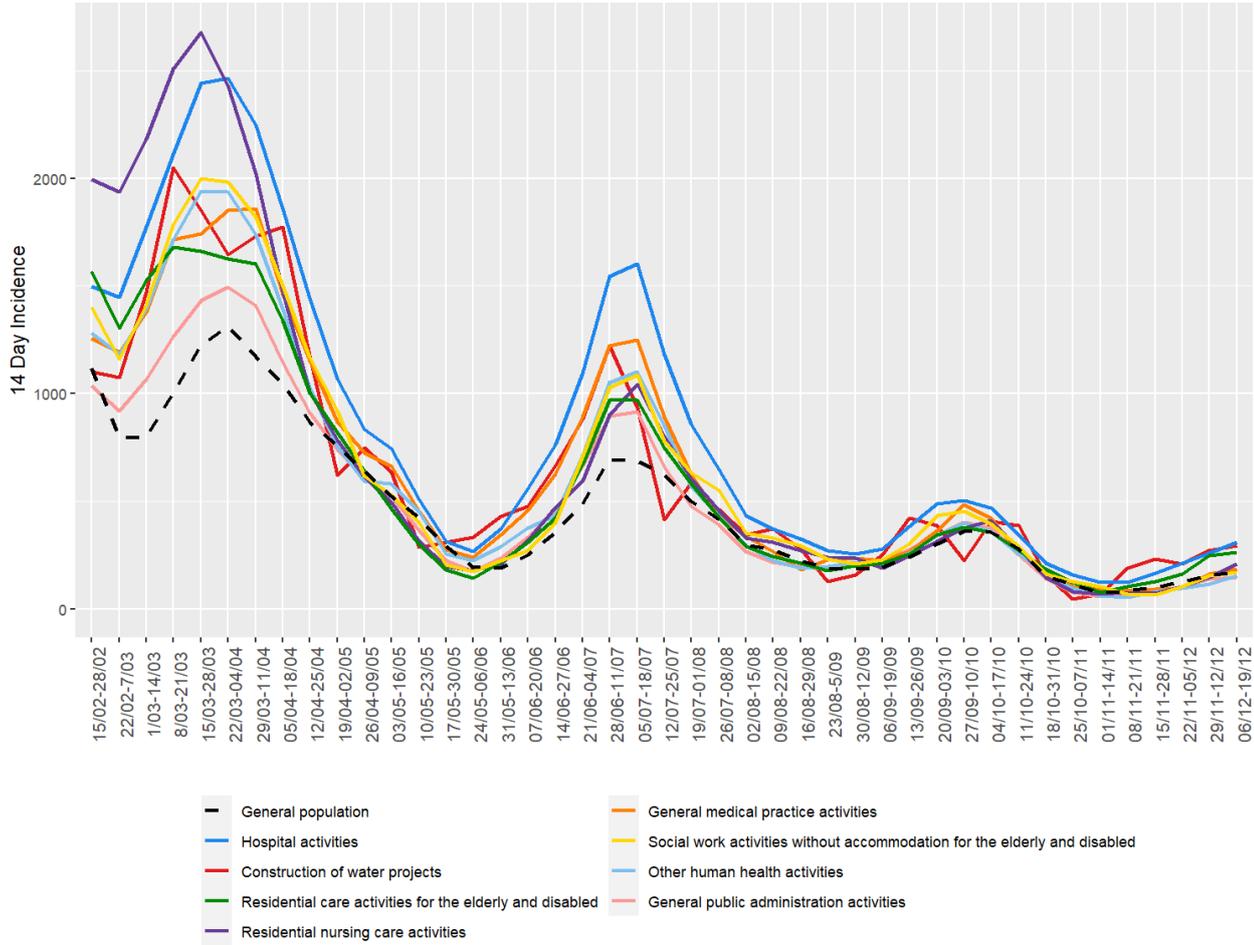


Figure 5: 14-Day incidence of COVID-19 infection in sectors with the highest incidence at Level 4 in both employees and self-employed

Table 4: 14-Day incidence of COVID-19 infection in sectors with the highest incidence at Level 4 on 19 December 2022

DESCRIPTION	NACE-code	Total number of workers	Incidence (95%CI) all workers	Incidence (95%CI) employees	Incidence (95%CI) self-employed	Percentage of self-employed workers
Hospital activities	8610	223226	310(288;334)	310(288;334)		0.32
Construction of water projects	4291	4422	294(171;506)	294(171;506)		7.11
Residential care activities for the elderly and disabled	8730	68441	263(227;304)	263(227;305)		1.30
Residential nursing care activities	8710	53810	210(175;252)	210(175;253)		0.76
General medical practice activities	8621	17297	185(131;261)	193(130;285)	161(77;337)	25.73
Social work activities without accommodation for the elderly and disabled	8810	48538	171(138;212)	171(138;212)		1.09
General population			171	171	171	
Other human health activities	8690	53846	156(126;193)	191(146;249)	117(82;167)	47.93
General public administration activities	8411	339865	148(136;162)	148(136;162)		0.12
Working population		4660800	125(122;128)	125(122;128)		

3.5 Level 5 work sector

In the sectors at level 5 with a minimum of 3,000 workers, the sectors with a 14-day incidence on 19 December 2022 significantly higher than the working population average are: Residential and non-residential care for the elderly (87302, 87301, 87101, 88101), General and psychiatric hospitals (sector 86101, 86104), Activities of medical laboratory (sector 86901), General medical practice activities (sector 86210), Public Centers for Social Welfare (O.C.M.W.) (sector 84115) and Municipal government (sector 84114) (Table 5 and Figure 6).

14-Days incidence of top 15 Level 5 Employees and Self-employed

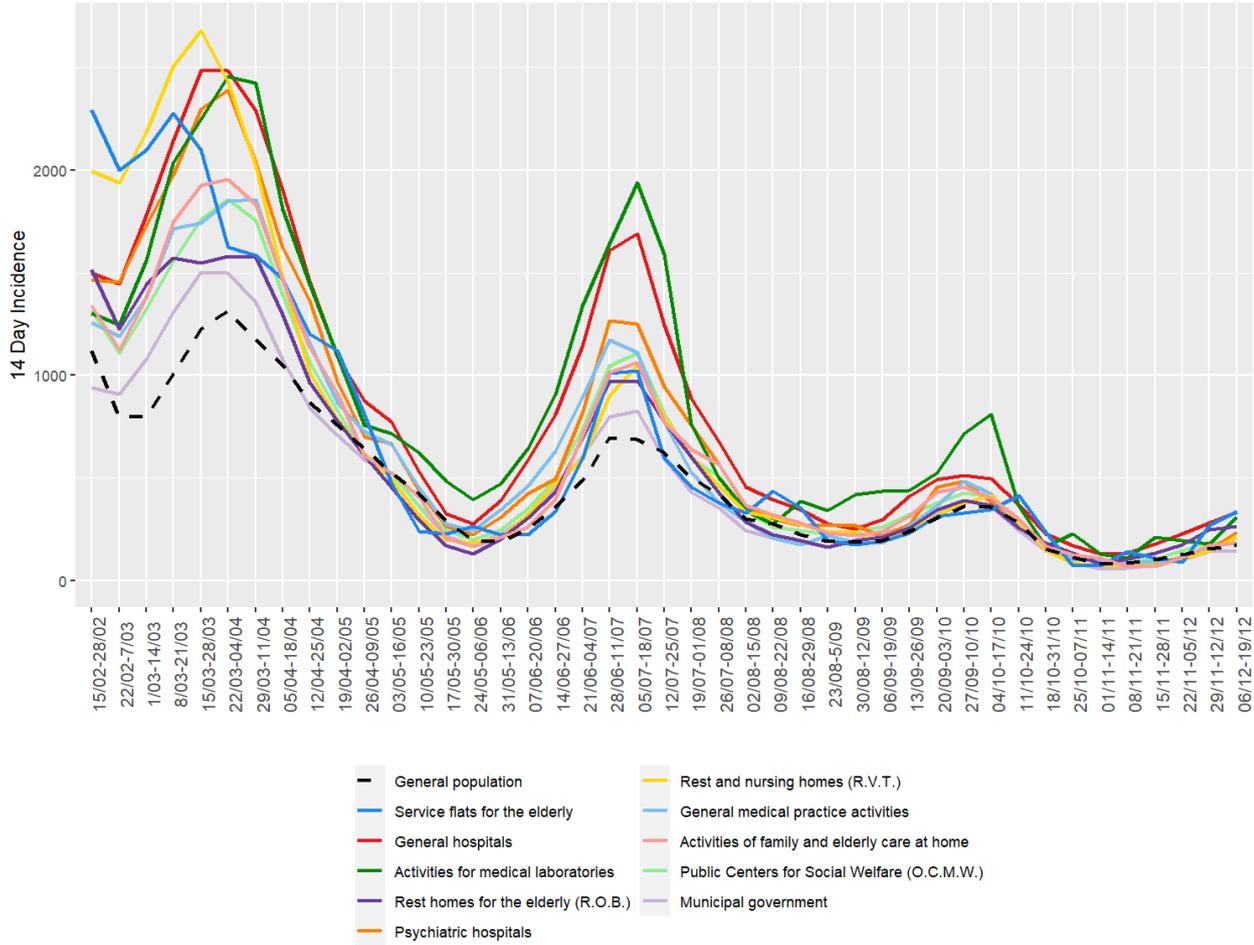


Figure 6: 14-Day incidence of COVID-19 infection in sectors with the highest incidence at Level 5 in both employees and self-employed

Table 5: 14-Day incidence of COVID-19 infection of sectors with the highest incidence at Level 5 on 19 December 2022

DESCRIPTION	NACE-code	Total number of workers	Incidence (95%CI) all workers	Incidence (95%CI) employees	Incidence (95%CI) self-employed	Percentage of self-employed workers
Service flats for the elderly	87302	5621	338(216;529)	338(216;529)		3.54
General hospitals	86101	179518	332(306;360)	332(306;360)		0.26
Activities for medical laboratories	86901	6189	307(196;481)	311(193;500)		11.69
Rest homes for the elderly (R.O.B.)	87301	59160	262(224;307)	261(223;306)		1.08
Psychiatric hospitals	86104	37179	234(190;289)	234(190;289)		0.32
Rest and nursing homes (R.V.T.)	87101	53555	211(175;254)	211(175;254)		0.73
General medical practice activities	86210	17297	185(131;261)	193(130;285)	161(77;337)	25.73
Activities of family and elderly care at home	88101	44809	183(147;227)	183(147;227)		0.85
Public Centers for Social Welfare (O.C.M.W.)	84115	85475	179(153;210)	178(152;209)		0.16
General population			171	171	171	
Municipal government	84114	152055	146(128;167)	146(128;167)		0.13
Working population		4660800	125(122;128)	125(122;128)		

Finally, when considering specifically the non-medical contact professions, we see that the incidence is lower than the working population average (Figure 7).

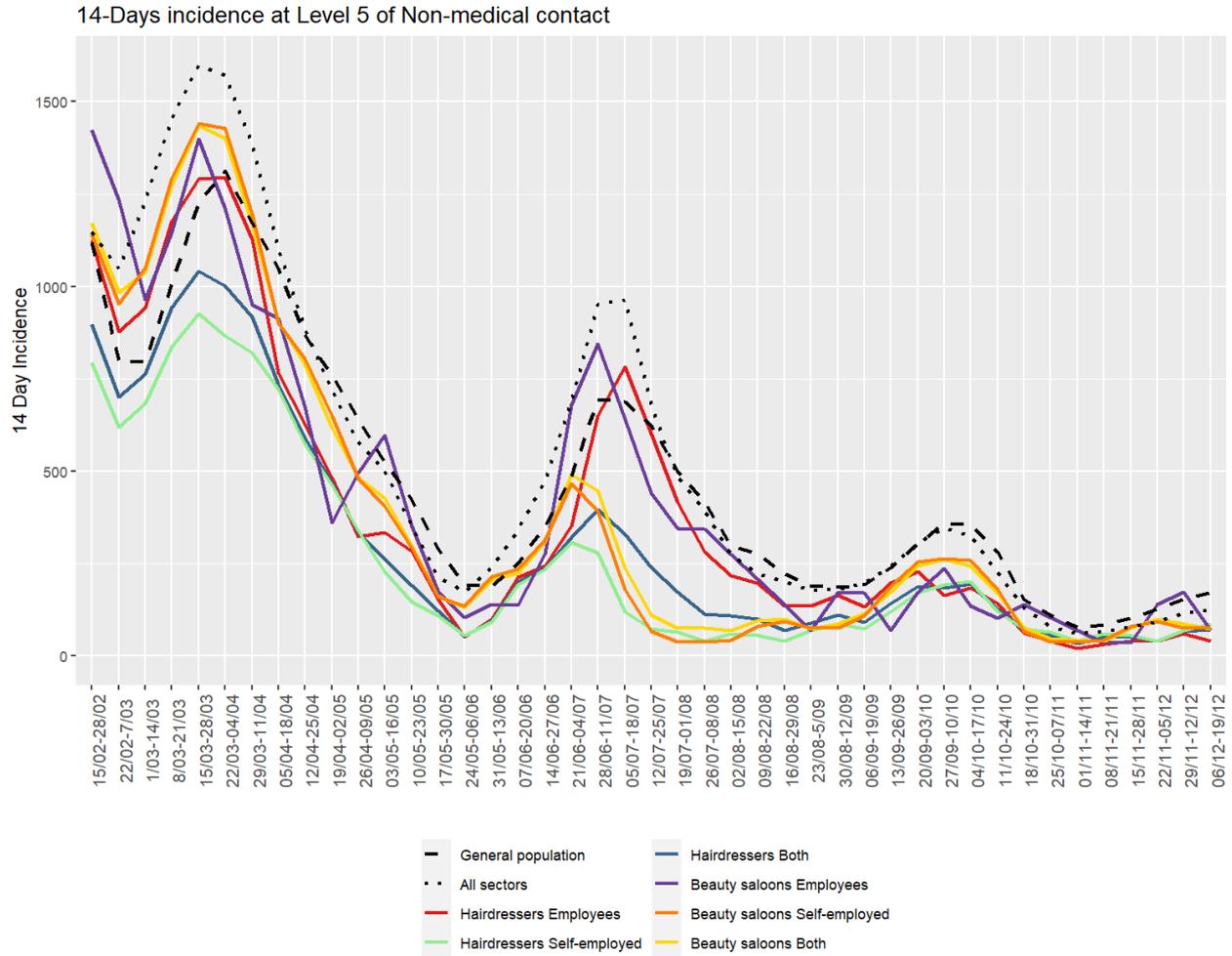


Figure 7: 14-Day incidence of COVID-19 infection at Level 5 of non-medical contact professions.

3.6 Additional analyses

3.6.1 Cross-level overview

When contemplating the 14-day incidences across NACE-BEL sectors, it is possible to gauge the contribution of each sub-level sector to the higher level incidence (Figure 8).

The 14-day incidence in the Human health and social work sector (sector Q) is elevated compared to the working and general population (Figure 8), which is mainly due to Hospital activities and residential care activities.

Although the 14-day incidence in Public administration and defence (sector O) and Construction (F) is similar or below the working population average, Public Centers for Social Welfare, Municipal government and construction of water projects show an increased incidence.

It is encouraging that the incidence in Education (P), Other service activities (sector S), Arts, entertainment and recreation (sector R), Accommodation and food service activities (sector I) and Transportation and storage (sector H) is similar to or below the general and working population average.

The sectors Manufacturing (sector C) and Wholesale and retail trade (sector G) are sectors with the highest number of sublevels. This results in large differences in 14-day incidences within the sector. It is encouraging that no sector shows an increased incidence in manufacturing, the retail and wholesale sector (Figure 8).

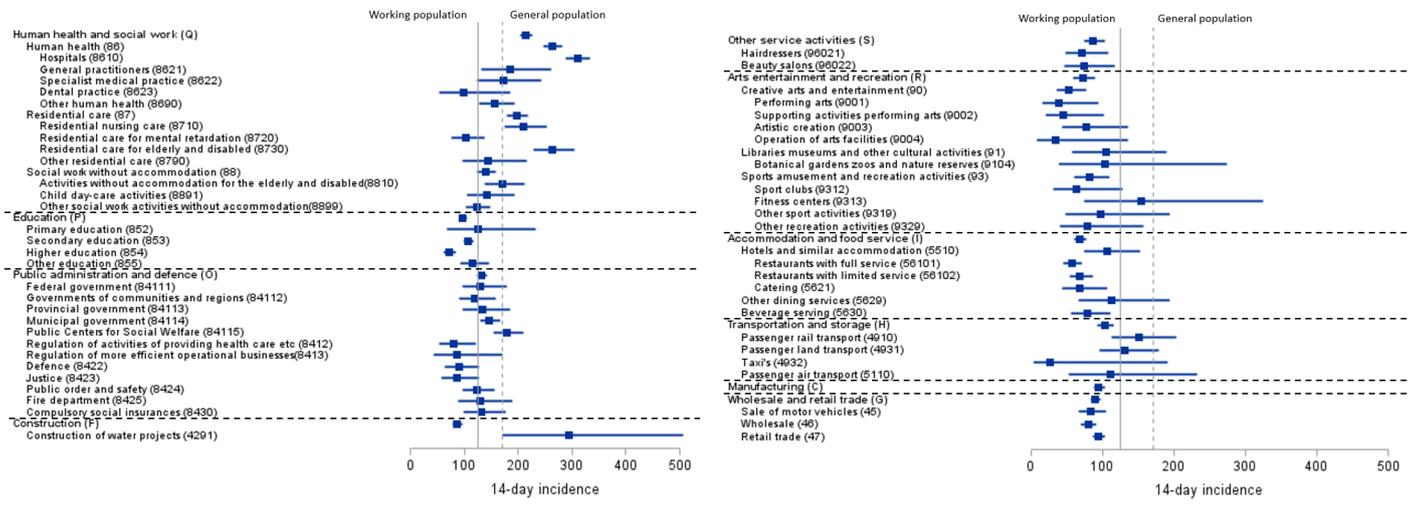


Figure 8: Forest plot of 14-Day incidence and 95% CI of selected sectors (S) on 19 December 2022 in both employees and self-employed.

4 Conclusion

Despite the limitations of the data, the RSZ/ONSS data demonstrates that the 14-day COVID-19 incidences in most sectors remain stable in the last 2 weeks, except for the health and social work sector, where the incidences continue to increase. The average incidence in the working population is 27% lower than the average incidence in the general population, suggesting that infections are less common in working adults than in children and the elderly. Although the changed testing procedure in schools and the general population may influence this comparison.

Vigilance is required in especially human health, residential care, social work and public administration sectors since they're not able to telework.

Although no conclusions can be drawn regarding the location of infection (workplace or elsewhere) nor the location of employment (at work, telework, or temporarily unemployed) of the employees in the RSZ/ONSS data, the contact tracing in the segments under surveillance by IDEWE showed that in the index cases, where this information was available, 7% indicated that the workplace was certainly the source of infection. Due to changed testing policy in March 2022, insufficient data is available from the contact tracing to provide accurate results.

It is important to carefully monitor the incidence of COVID-19 in all sectors, especially sectors with frequent high risk contacts with an increased incidence compared to the working population average. Hospital activities, residential and non-residential care for the elderly, activities of medical laboratory, general medical practice activities and municipal government all show an increased incidence compared to the working population average and require continuous careful attention.

For some sectors the reason for the higher incidences is not immediately obvious, such as Construction for water projects and Public Centers for Social Welfare. It would be worthwhile to evaluate the hygiene protocols and its practice in these sectors, although the changed testing procedure and low 14-day incidence in general may be partly responsible.

The incidence in non-medical contact professionals is below to the working and general population average.

It is encouraging to note that employees in other service activities, arts, entertainment and recreation, accommodation and food services, transportation and storage, manufacturing and wholesale and retail sectors are well protected, as they are often not able to telework.

Acknowledgments

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