

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 (16– 29 August 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 sector with a 14-day incidence on 29 August 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 continue to decrease in all sectors. The working population average is slightly lower (9%) than the general population average.

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

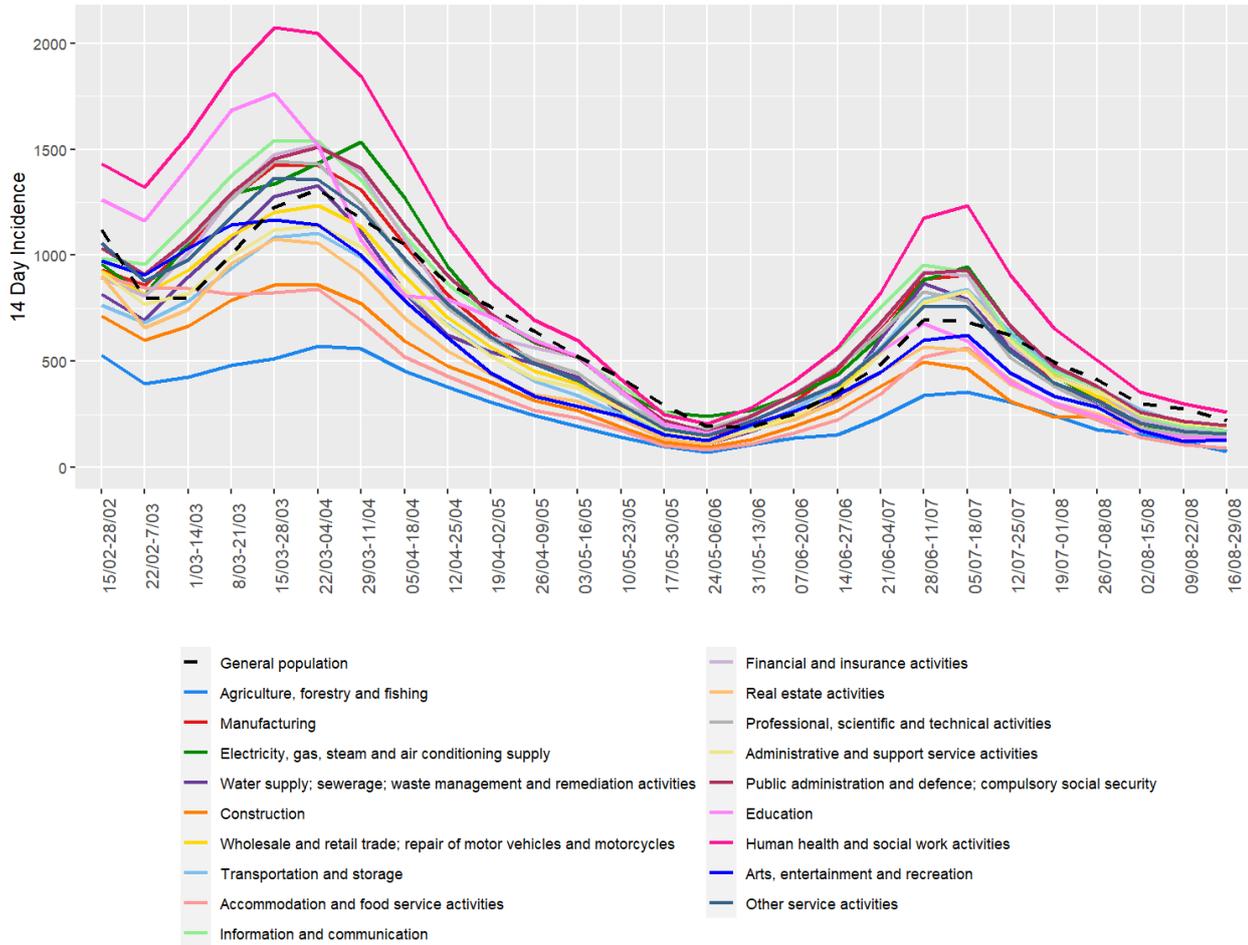


Figure 1: 14-Day incidence of COVID-19 infection of 20 sectors at Level 1 in both employees and self-employed workers

Table 1: 14-Day incidence of COVID-19 infection of 20 sectors at Level 1 on 29 August 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	688417	259(247;271)	270(258;283)	132(105;167)	8.04
General population			221	221	221	
Working population		4622277	202(198;206)	202(198;206)		
Public administration and defence; compulsory social security	O	577387	199(188;211)	199(188;211)		0.18
Manufacturing	C	635385	195(184;206)	205(194;217)	103(81;131)	10.25
Administrative and support service activities	N	445503	189(177;202)	203(189;218)	123(101;150)	18.23
Electricity, gas, steam and air conditioning supply	D	21264	174(126;240)	175(126;244)		6.20
Transportation and storage	H	317647	170(156;185)	177(162;193)	95(65;138)	9.12
Information and communication	J	187647	170(152;190)	179(158;203)	149(120;185)	29.63
Water supply; sewerage; waste management and remediation activities	E	39024	164(128;209)	169(132;217)		6.08
Wholesale and retail trade; repair of motor vehicles and motorcycles	G	859146	164(156;173)	182(172;192)	101(88;116)	22.48
Other service activities	S	162500	160(142;181)	178(152;209)	141(117;170)	49.35
Financial and insurance activities	K	159236	157(139;178)	183(161;208)	66(44;99)	22.29
Construction	F	385065	154(142;167)	191(174;210)	98(84;115)	40.84
Professional, scientific and technical activities	M	399306	144(133;156)	168(152;186)	116(101;133)	46.99
Education	P	626619	139(130;149)	141(132;151)	103(71;150)	4.28
Real estate activities	L	59259	135(108;168)	204(155;268)	83(57;120)	57.85
Arts, entertainment and recreation	R	116667	132(113;155)	142(118;171)	113(84;151)	34.85
Accommodation and food service activities	I	359341	91(82;101)	94(83;106)	79(61;103)	20.70
Agriculture, forestry and fishing	A	10000	74(59;93)	47(31;71)	99(75;130)	52.58

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 29 August 2022 above the working population average are: Human health activities (sector 86), Manufacturing of basic metals (sector 24) and Social work activities without accommodation (sector 88) (Table 2 and Figure 2).

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

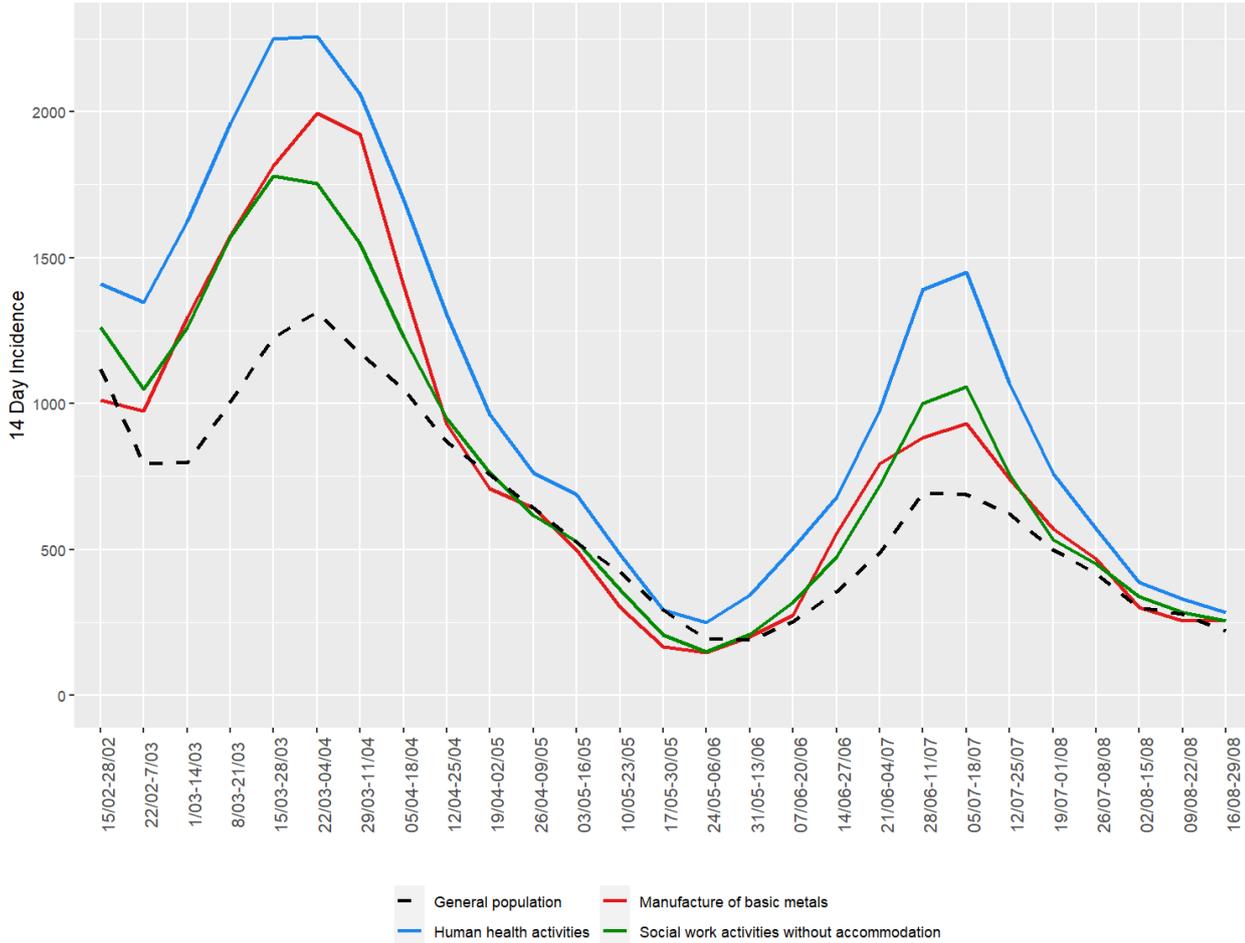


Figure 2: 14-Day incidence of COVID-19 infection in sectors with the highest incidence at Level 2 in both employees and self-employed workers

Table 2: 14-Day incidence of COVID-19 infection in sectors with the highest incidence at Level 2 on 29 August 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	328169	284(266;303)	310(290;331)	127(99;164)	14.69
Manufacture of basic metals	24	25483	259(204;330)	259(204;330)		2.91
Social work activities without accommodation	88	172656	256(233;281)	258(235;283)	184(99;342)	3.17
General population			221	221	221	
Working population		4622277	202(198;206)	202(198;206)		

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 29 August 2022 significantly above the working population average are: Manufacture of medical and dental instruments (sector 325), Hospital activities (sector 861), Social work activities without accommodation (sector 881, 889), Warehousing and storage (sector 521) and Residential nursing care activities (sector 871) (Table 3 and Figure 3).

The incidences in education continue to decrease similar to the incidence of the working and general 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

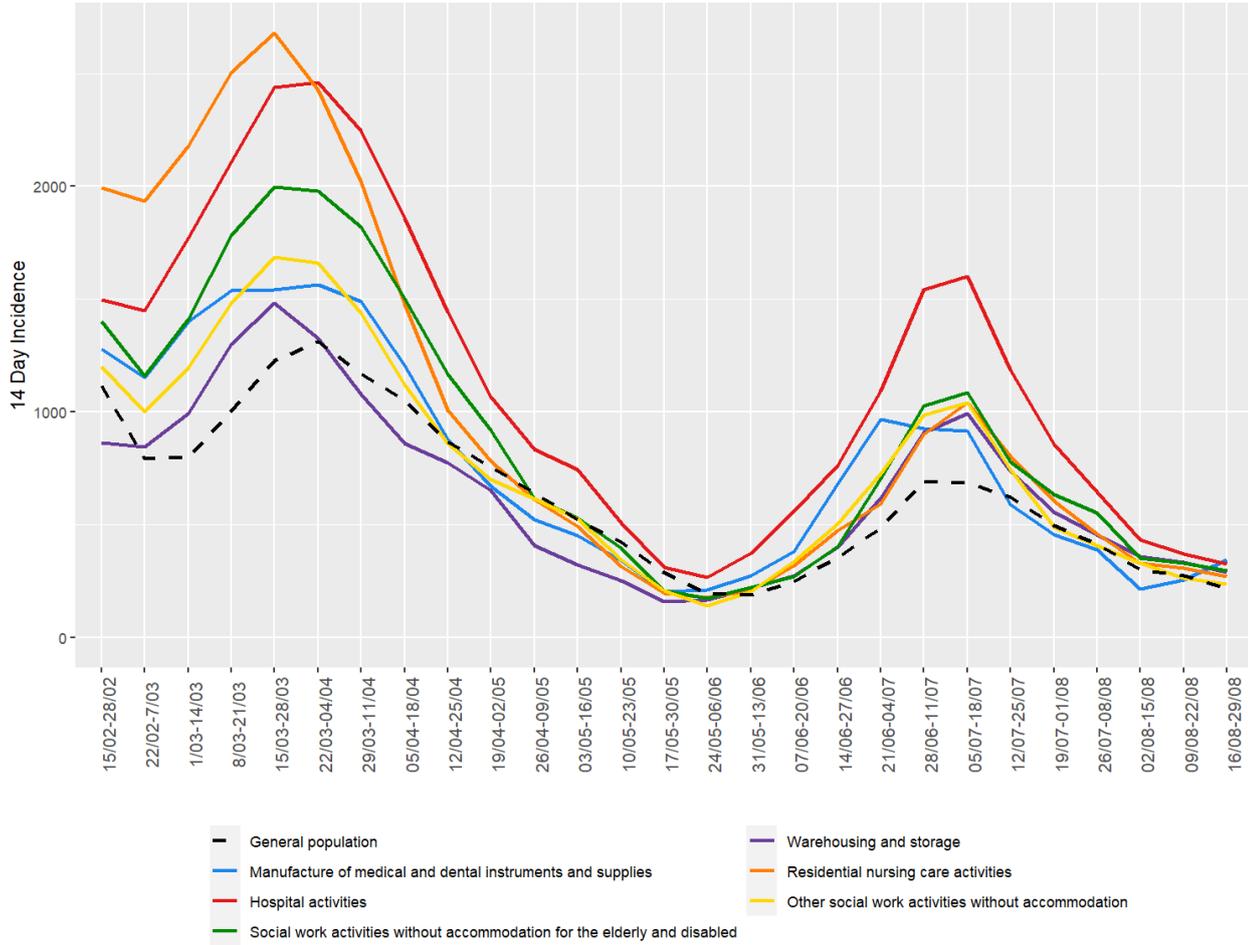


Figure 3: 14-Day incidence of COVID-19 infection in sectors with the highest incidence at Level 3 in both employees and self-employed

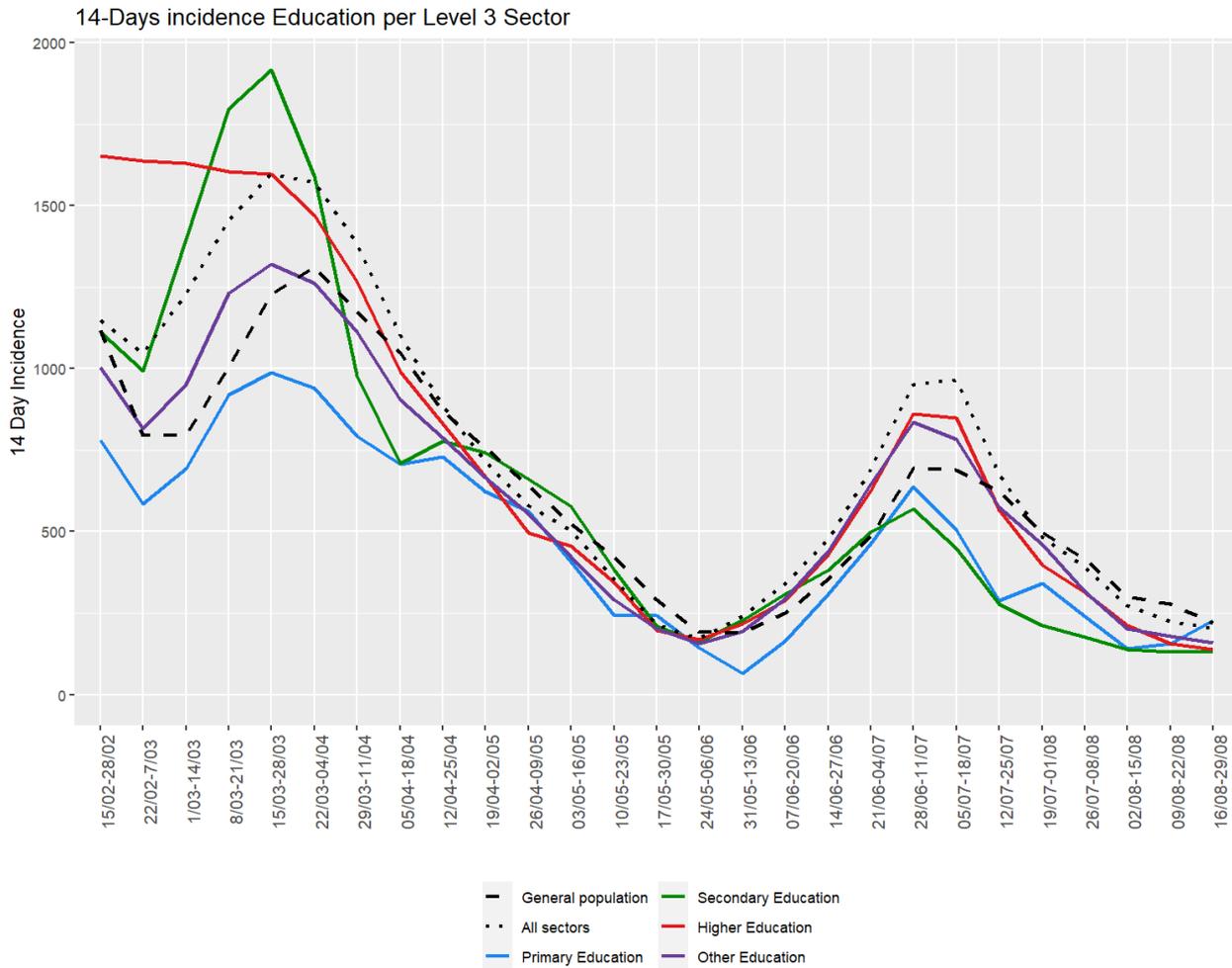


Figure 4: 14-Day incidence of COVID-19 infection in Education sectors at Level 3 in both employees and self-employed

Table 3: 14-Day incidence of COVID-19 infection in sectors with the highest incidence at Level 3 on 29 August 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
Manufacture of medical and dental instruments and supplies	325	5780	346(223;536)	346(223;536)		21.79
Hospital activities	861	228221	326(303;350)	326(303;350)		0.31
Social work activities without accommodation for the elderly and disabled	881	48986	296(252;348)	295(250;347)		1.08
Warehousing and storage	521	37024	289(239;349)	289(239;349)		2.86
Residential nursing care activities	871	55882	272(232;319)	270(230;317)		0.73
Other social work activities without accommodation	889	123750	240(214;269)	244(217;274)	158(79;316)	4.12
General population			221	221	221	
Working population		4622277	202(198;206)	202(198;206)		

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 29 August 2022 significantly higher than the working population average are: Operation of historical sites and buildings (sector 9103), Wholesale of metals (sector 4672), Manufacturing sectors (sector 3250, 1082), Hospital activities (sector 8610), Social work activities without accommodation (sector 8899, 8810), Warehousing and storage (sector 5210) and Residential nursing care activities (sector 8710) (Table 4 Figure 5).

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

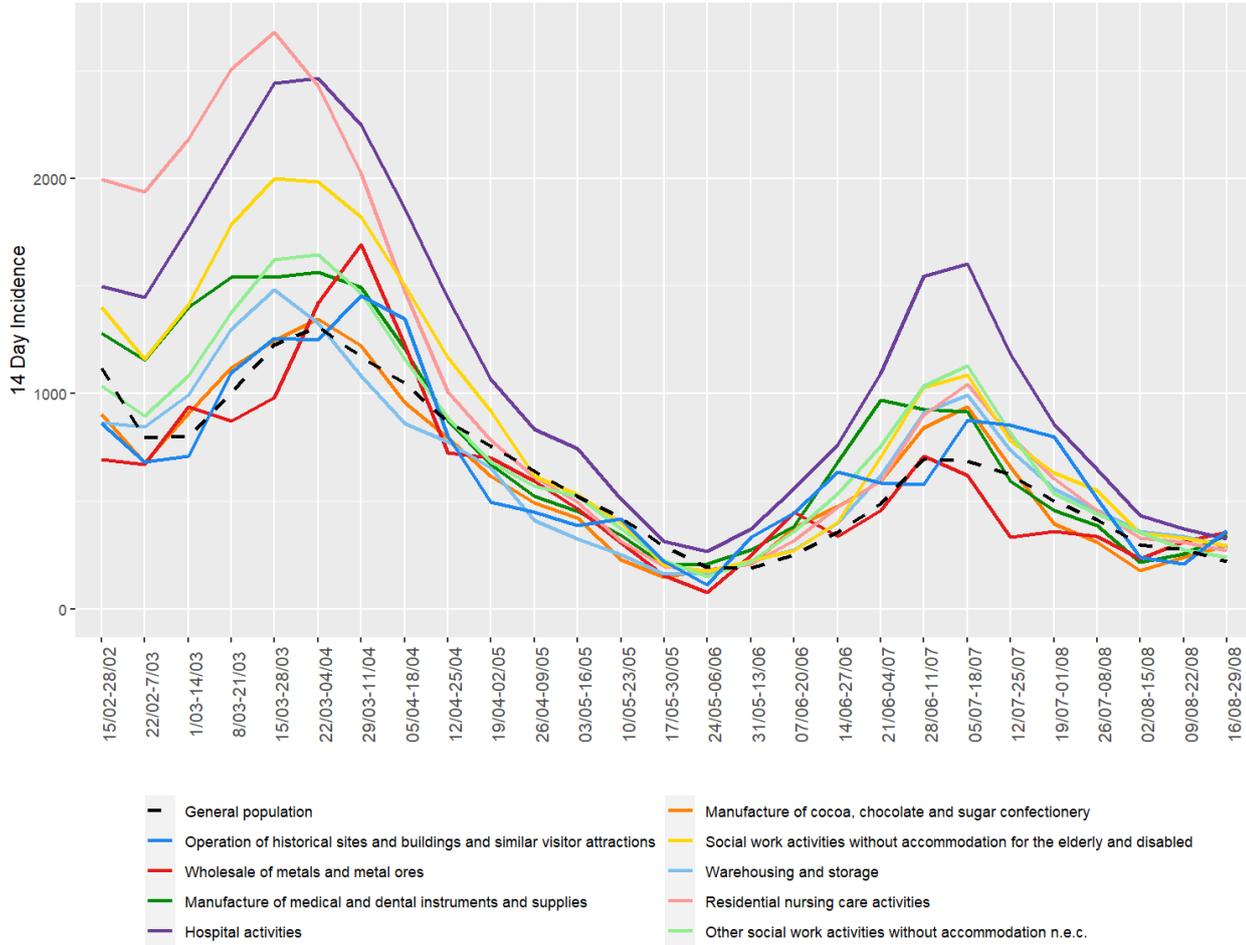


Figure 5: 14-Day incidence of COVID-19 infection in sectors with the highest incidence at Level 4 in both employees and self-employed

Table 4: 14-Day incidence of COVID-19 infection in sectors with the highest incidence at Level 4 on 29 August 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
Operation of historical sites and buildings and similar visitor attractions	9103	3279	366(208;643)			12.56
Wholesale of metals and metal ores	4672	4469	358(219;584)	385(232;638)		12.85
Manufacture of medical and dental instruments and supplies	3250	5780	346(223;536)	346(223;536)		21.79
Hospital activities	8610	228221	326(303;350)	326(303;350)		0.31
Manufacture of cocoa, chocolate and sugar confectionery	1082	12838	296(215;407)	276(196;388)		6.69
Social work activities without accommodation for the elderly and disabled	8810	48986	296(252;348)	295(250;347)		1.08
Warehousing and storage	5210	37024	289(239;349)	289(239;349)		2.86
Residential nursing care activities	8710	55882	272(232;319)	270(230;317)		0.73
Other social work activities without accommodation n.e.c.	8899	93333	240(211;274)	242(212;276)	178(80;396)	3.62
General population			221	221	221	
Working population		4622277	202(198;206)	202(198;206)		

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 29 August 2022 significantly higher than the working population average are: Activities of medical laboratories (secto 86901), Operation of historical sites and buildings (sector 91030), Wholesale of metals (sector 46720), Service flats for the elderly (sector 87302), Manufacturing sectors (sector 32500, 10820), General and psychiatric hospitals (sector 86101, 86104), Warehousing and storage (sector 52100), Activities of family and elderly care at home (sector 88101), Sheltered workshops (sector 88995), Rest and care homes (sector 87101) and Public Centres for Social Welfare (OCMW) (sector 84115) (Table 5 and Figure 6).

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

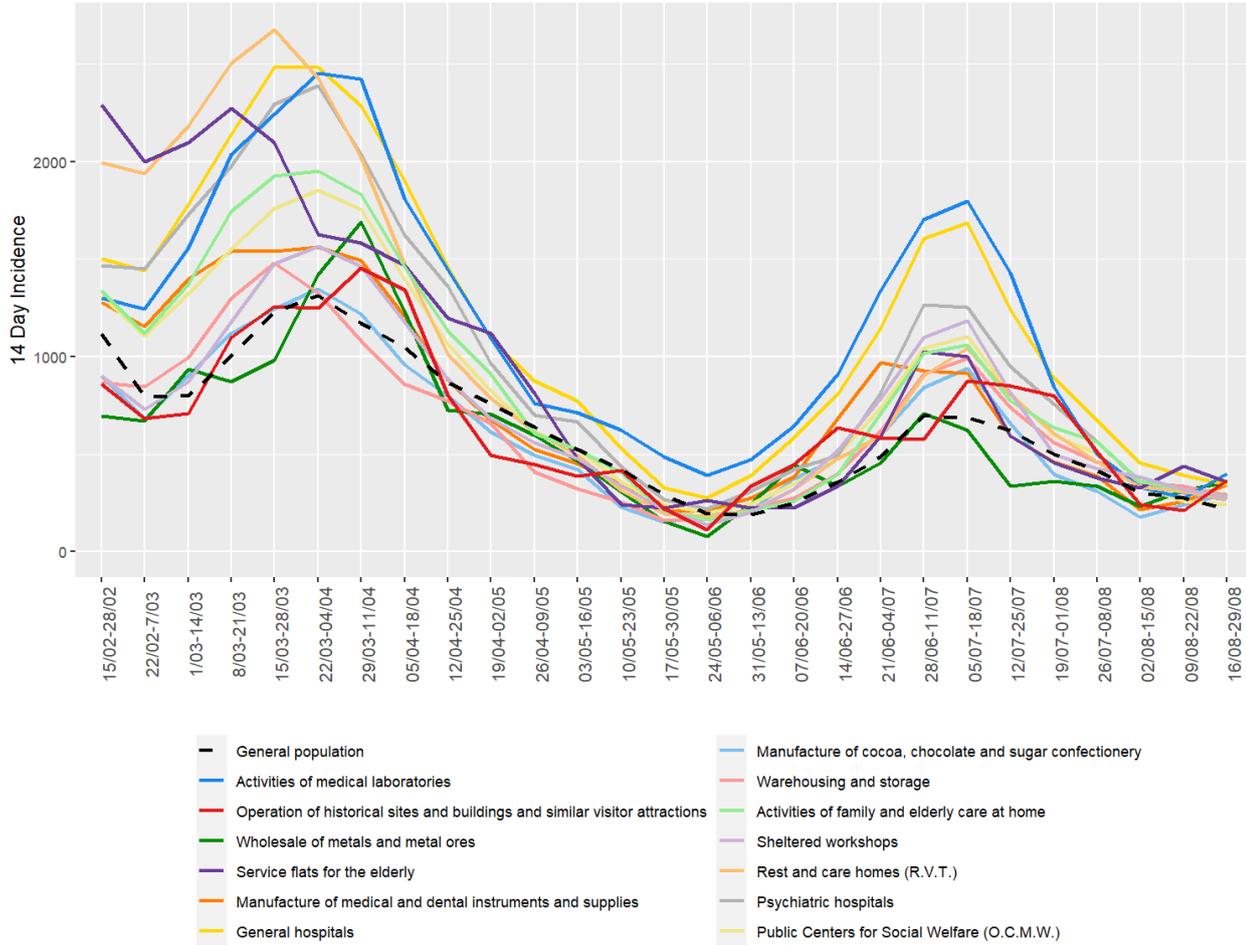


Figure 6: 14-Day incidence of COVID-19 infection in sectors with the highest incidence at Level 5 in both employees and self-employed

Table 5: 14-Day incidence of COVID-19 infection of sectors with the highest incidence at Level 5 on 29 August 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
Activities of medical laboratories	86901	5764	399(265;600)	399(265;600)		11.24
Operation of historical sites and buildings and similar visitor attractions	91030	3279	366(208;643)			12.56
Wholesale of metals and metal ores	46720	4469	358(219;584)	385(232;638)		12.85
Service flats for the elderly	87302	5882	357(233;547)	352(227;545)		3.51
Manufacture of medical and dental instruments and supplies	32500	5780	346(223;536)	346(223;536)		21.79
General hospitals	86101	182849	344(318;372)	344(318;372)		0.25
Manufacture of cocoa, chocolate and sugar confectionery	10820	12838	296(215;407)	276(196;388)		6.69
Warehousing and storage	52100	37024	289(239;349)	289(239;349)		2.86
Activities of family and elderly care at home	88101	45000	280(235;333)	280(235;334)		0.85
Sheltered workshops	88995	49819	277(234;327)	277(234;327)		1.02
Rest and care homes (R.V.T.)	87101	55882	272(232;319)	270(230;317)		0.70
Psychiatric hospitals	86104	37970	266(219;323)	266(219;323)		0.31
Public Centers for Social Welfare (O.C.M.W.)	84115	87603	242(212;277)	242(212;277)		0.15
General population			221	221	221	
Working population		4622277	202(198;206)	202(198;206)		

Finally, when considering specifically the non-medical contact professions, we see that the incidence in the beauty saloons is higher compared to the incidence in the hairdressers, both remain below the working and general population average (Figure 7).

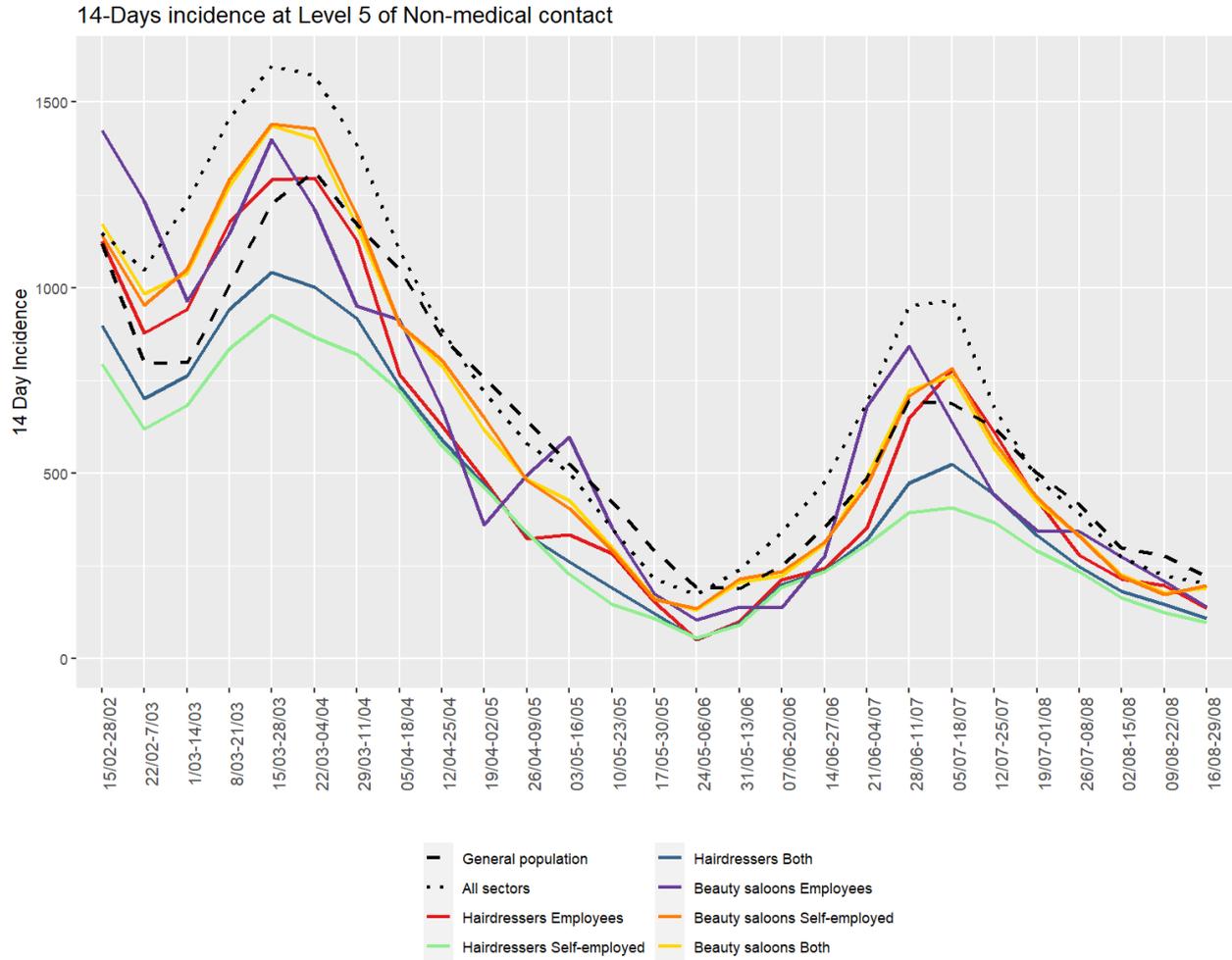


Figure 7: 14-Day incidence of COVID-19 infection at Level 5 of non-medical contact professions.

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 caused by the hospitals, residential care and social work without accommodation subsectors.

Although the 14-day incidence in Public administration and defence (sector O), Arts, entertainment and recreation (sector R) and Transportation and storage (sector H) is around or below the working population average, individual subsectors show an increased incidence compared to the working population, such as OCMW (sector 84115), Operation of historical sites and buildings (sector 9103) and Warehousing and storage (sector 5210).

It is encouraging that the incidence in Other service activities (sector S), Accommodation and food service activities (sector I) and Education (sector P) 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 only a few sectors in the manufacturing and wholesale sector show an increased incidence and none in the retail sale sector (Figure 8).

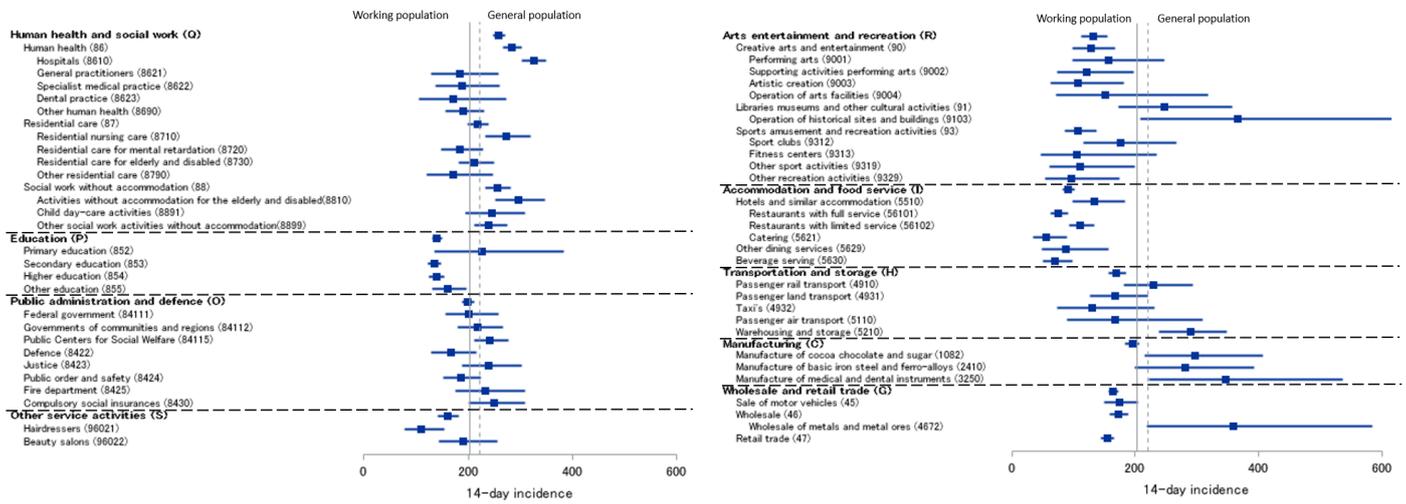


Figure 8: Forest plot of 14-Day incidence and 95% CI of selected sectors on 29 August 2022 in both employees and self-employed.

4 Conclusion

Despite the limitations of the data, the RSZ/ONSS data demonstrates a continuous decrease in the 14-day COVID-19 incidences in all sectors. The highest incidences are still present in the health and residential care sector. The average incidence in the working population is slightly lower (9%) than the average incidence in the general population, suggesting that infections are equally 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 care, social work without accommodation, public centres for social welfare and some manufacturing and wholesale sectors all show an increased incidence compared to the general population average and require continuous careful attention.

For some sectors the reason for the higher incidences is not immediately obvious, such as Warehousing and storage and Operation of historical sites and buildings. It would be worthwhile to evaluate the hygiene protocols and its practice in these sectors.

The incidence in non-medical contact professionals is below or equal to the working and general population average, with slightly higher incidences in beauty saloons compared to hairdressers.

It is encouraging to note that employees in accommodation and food services, education other service activities and retail sectors are well protected, as they are often not able to telework.

Despite the high degree of vaccination, COVID-19 infection remains possible. Continuous monitoring of breakthrough infections, despite primo and booster vaccination, is warranted and additional booster vaccination for high risk employees in the health and residential care sector should be considered.

Acknowledgments

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