

Monitoring Belgian COVID-19 infections in work sectors in 2021

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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. Two sources of information on infection in work sectors will be used in this report: the RSZ/ONSS data and the contact tracing data.

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.

1.2 Contact tracing

For companies affiliated with IDEWE, COVID-19 positive tested employees are reported to IDEWE starting from 22 July 2020. Of these index cases, contact tracing is performed of high and low-risk contact within the company. Subsequently, appropriate measures are taken within the company and by high-risk contacts to limit spread of the infection. Since 11 March 2021, index cases are asked about the work relatedness of their infection. At the start of the contact tracing, data were registered in a shared Excel file. From 29 October 2020 onwards, a ‘tracing application’ was used to register all notifications of index cases in companies under medical surveillance of IDEWE. Note that high and low-risk contacts are registered only for contacts in the company, contacts at home or in leisure time are not registered.

An index case can be any person present in the company. It can be an employee, but also an interim worker, an intern, etc. Importantly, for schools, the index case can also be a student. Of the index cases the employer information is retrieved via the INSZ number by IDEWE. Information of the employer is subsequently grouped by region and by customer segments. Although some customer segments are similar to the NACE code sectors, this is not true in general. IDEWE considers 10 customer segments based on the NACE codes of the companies, but these segments resemble only partially level 1 and 2. The segment classification is based on similarities in the needs of IDEWE’s customers and in the services IDEWE provides for them.

The incidences in the RSZ/ONSS sectors may differ from those in the contact tracing customer segments due to two aspects:

1. The RSZ/ONSS data concerns all employees and self-employed workers, while the contact tracing data concerns only companies under surveillance.
2. Similar named sectors and customer segments may contain different companies.

For instance, the NACE sector ‘education’ contains only information on positive cases among employees, while the contact tracing data also contain pupils. In schools, a considerable amount of index cases were pupils, especially since the onset of increased testing of children in January 2021. Finally, the contact tracing for the education segment is performed by regionally organised Student Guidance Centres (SGC). The organisation of the contact tracing by the SGC can vary from centre to centre and often only index cases with high-risk contacts are reported to IDEWE.

IDEWE has 9 regional offices that cover the surrounding areas and that are called after the city where they are located. Most Belgian provinces have one regional office, except Antwerp that is served by the regions Antwerpen, Mechelen and Turnhout, and Namur that serves all of Wallonia. The sole exception is Public transport. Companies belonging to this segment are not regionally divided.

Note that some larger companies have organised contact tracing by their internal prevention service. Data of these companies are however not included in this analysis, causing an underestimation of index cases in general. For some segments this underestimation might be more important than for others.

2 Methodology

2.1 RSZ/ONSS data

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 (19 October–1 November 2021) 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.

2.2 Contact tracing

In addition to the comparison of the 14-day incidence of index cases between customer segments under surveillance, also the 14-day incidence of index cases between regions are compared. The reported day is the last day of the 14-day period.

Since its initiation on 29 October 2020, the tracing application registers in a standardized manner, besides information on incidences, also information on high-risk and low-risk contacts of index cases. Per segment and per region, the mean number of high-risk contacts by the index case over the entire study period (29 October 2020–28 October 2021) and the four-weekly percentage of index cases with two or more high risk contacts are evaluated.

There might be an underreporting of high-risk contacts because the number of contacts for an index case is set equal to 0 by default by the application. For index cases, who for example could not be contacted or who refused to answer, the number of high and low-risk contacts is reported 0, which may not coincide with reality. The incidences reported by contact tracing depend on the testing willingness in sectors and accuracy in reporting high-risk contact.

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 21 sectors at level 1, the sectors with a 14-day incidence on 1 November 2021 significantly above the working population average are Education (sector P), Human health and social work activities (sector Q) and Public administration and defence (sector O) (Table 1 and Figure 1). The sharp increase in incidences in the last 3 weeks is present in all sectors.

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

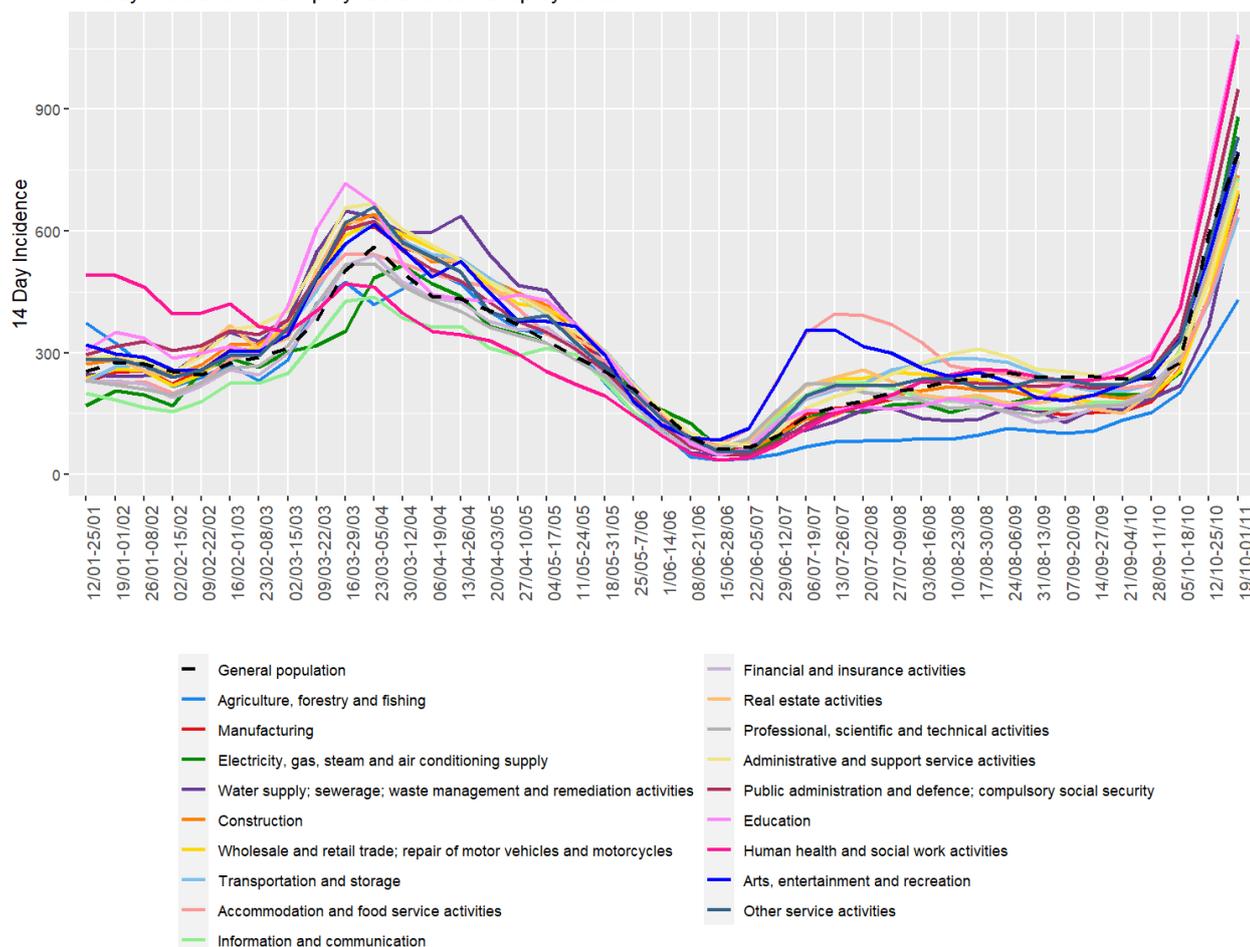


Figure 1: 14-Day incidence of COVID-19 infection of all 21 sectors at Level 1 in both employees and self-employed workers

Table 1: 14-Day incidence of COVID-19 infection of all 21 sectors at Level 1 on 1 November 2021

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
Education	P	604516	1085(1059;1111)	1080(1054;1107)	1192(1067;1331)	4.45
Human health and social work activities	Q	647989	1069(1044;1094)	1064(1038;1090)	1130(1044;1223)	8.52
Public administration and defence; compulsory social security	O	544479	951(926;977)	950(925;976)		0.20
Electricity, gas, steam and air conditioning supply	D	21404	883(766;1018)	891(770;1031)		6.18
Working population		4506032	862(854;871)	862(854;871)		
Other service activities	S	160144	833(790;879)	801(742;864)	866(803;933)	49.82
Arts, entertainment and recreation	R	109434	795(744;849)	740(679;807)	892(804;989)	37.34
Real estate activities	L	58616	795(726;870)	724(626;837)	847(755;951)	58.49
General population			791	791	791	
Professional, scientific and technical activities	M	392903	775(748;803)	716(681;753)	842(801;885)	47.87
Financial and insurance activities	K	159561	774(732;818)	755(708;805)	843(753;944)	22.26
Construction	F	381707	738(711;766)	676(643;710)	830(786;877)	41.17
Information and communication	J	184268	731(693;771)	718(673;765)	763(693;840)	30.21
Administrative and support service activities	N	439528	721(696;746)	702(675;730)	806(746;871)	18.51
Wholesale and retail trade; repair of motor vehicles and motorcycles	G	830571	700(682;718)	705(685;726)	681(645;719)	23.13
Water supply; sewerage; waste management and remediation activities	E	35931	693(612;784)	679(597;773)		6.61
Manufacturing	C	620845	686(666;707)	678(657;700)	757(693;827)	10.50
Accommodation and food service activities	I	325802	655(628;683)	636(606;668)	725(665;790)	22.83
Transportation and storage	H	309134	635(608;664)	638(609;668)	604(520;701)	9.37
Agriculture, forestry and fishing	A	92093	430(390;474)	309(259;369)	521(463;586)	58.73

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 1 November 2021 significantly higher than the working population average are: Education (sector 85), Programming and broadcasting activities (sector 60), Human health and residential care activities (sector 86, 87), Social work without accommodation (sector 88) and Public administration and defence (sector 84) (Table 2 and Figure 2).

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

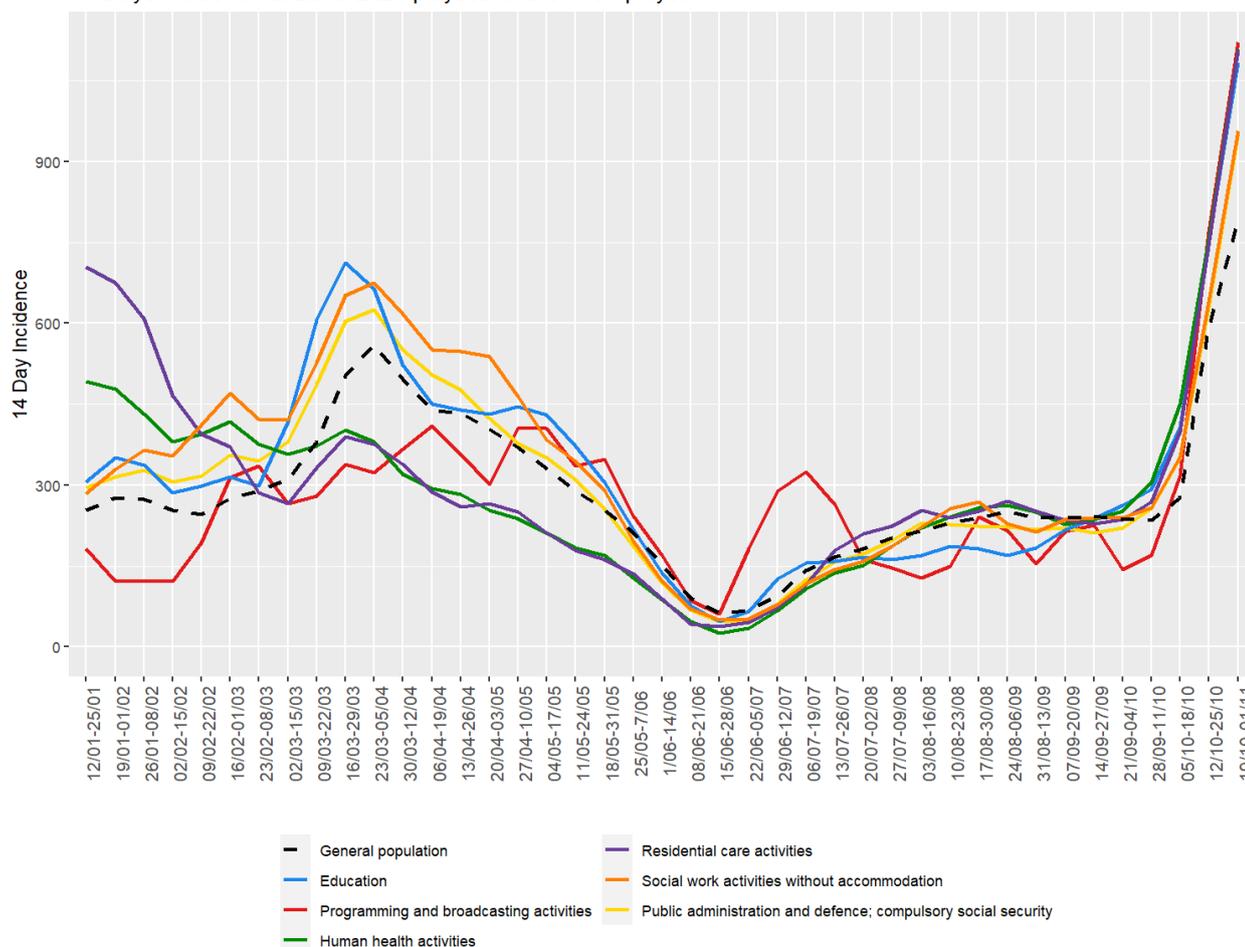


Figure 2: 14-Day incidence of COVID-19 infection in sectors with the highest incidence at Level 2 in both employees and self-employed workers

Table 2: 14-Day incidence of COVID-19 infection in sectors with the highest incidence at Level 2 on 1 November 2021

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
Education	85	604516	1085(1059;1111)	1080(1054;1107)	1192(1067;1331)	4.45
Programming and broadcasting activities	60	8831	1121(921;1363)	1118(914;1367)		4.85
Human health activities	86	313514	1110(1074;1147)	1109(1070;1149)	1115(1024;1214)	15.39
Residential care activities	87	166697	1108(1059;1159)	1113(1063;1165)	782(493;1238)	1.40
Social work activities without accommodation	88	168757	957(912;1005)	941(895;989)	1437(1152;1791)	3.24
Public administration and defence; compulsory social security	84	544479	951(926;977)	950(925;976)		0.20
Working population		4506032	862(854;871)	862(854;871)		
General population			791	791	791	

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 1 November 2021 significantly higher than the working population average are: Residential care (sector 879, 872, 873), Education (sector 853, 852, 855) (Figure 4), Health care (sector 869, 861, 862), Television programming and broadcasting activities (sector 602), Combined facilities support activities (sector 811), Provision of services to the community and administration of the state (sector 842, 841), Activities of other membership organisations (sector 949) and Other social work activities without accommodation (sector 889) (Table 3 and Figure 3).

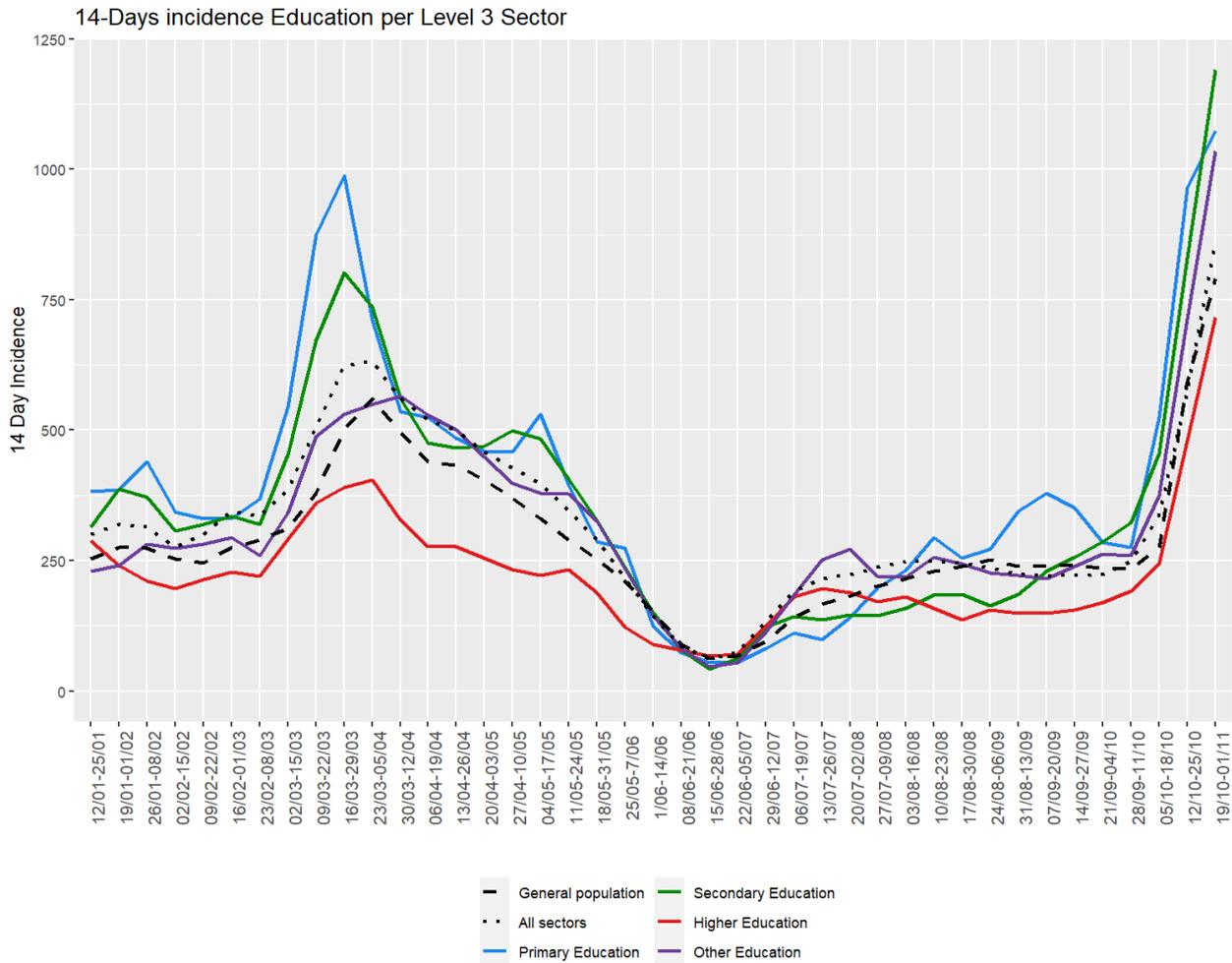


Figure 4: 14-Day incidence of COVID-19 infection in Education sectors at Level 3 in both employees and self-employed

Table 3: 14-Day incidence of COVID-19 infection in sectors with the highest incidence at Level 3 on 1 November 2021

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
Other residential care activities	879	16383	1349(1183;1538)	1367(1197;1560)		3.56
Residential care activities for mental retardation, mental health and substance abuse	872	41570	1287(1183;1400)	1301(1196;1416)		1.82
Secondary education	853	424517	1191(1159;1224)	1192(1160;1225)		0.20
Other human health activities	869	54195	1168(1081;1262)	1049(937;1174)	1300(1168;1446)	47.75
Television programming and broadcasting activities	602	8171	1126(919;1379)	1116(907;1372)		2.38
Hospital activities	861	214844	1125(1081;1170)	1125(1081;1171)		0.33
Combined facilities support activities	811	6110	1113(878;1409)		1124(700;1801)	24.75
Primary education	852	8186	1075(873;1323)	1060(851;1320)		9.01
Residential care activities for the elderly and disabled	873	68300	1041(968;1120)	1048(974;1128)		1.30
Other education	855	54976	1035(954;1123)	888(790;999)	1226(1094;1374)	44.00
Provision of services to the community as a whole	842	137062	1028(976;1083)	1028(976;1083)		0.11
Activities of other membership organisations	949	35242	1013(914;1123)	1014(908;1133)	1008(758;1339)	13.63
Other social work activities without accommodation	889	120247	973(919;1030)	951(897;1009)	1486(1187;1860)	4.23
Medical and dental practice activities	862	45181	965(879;1059)	1040(918;1178)	882(766;1016)	48.41
Administration of the State and the economic and social policy of the community	841	374273	929(899;960)	928(898;959)		0.17
Working population		4506032	862(854;871)	862(854;871)		
General population			791	791	791	

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 1 November 2021 significantly higher than the working population average are: Other retail sale not in stores, stalls or markets (sector 4799), Residential care (sector 8790, 8720, 8730), Child day-care (sector 8891), Education (sector 8551, 8531, 8520, 8559), Public order and safety activities (sector 8424), Fire service activities (sector 8425), Health care (sector 8621, 8690, 8610), Manufacture of air and spacecraft (sector 3030), Television and broadcasting activities (sector 6020), Combined facilities support activities (sector 8110), Services to air

transportation (sector 5223), Activities of other membership organisations (sector 9499) and General public administration activities (sector 8411) (Table 4 and Figure 5).

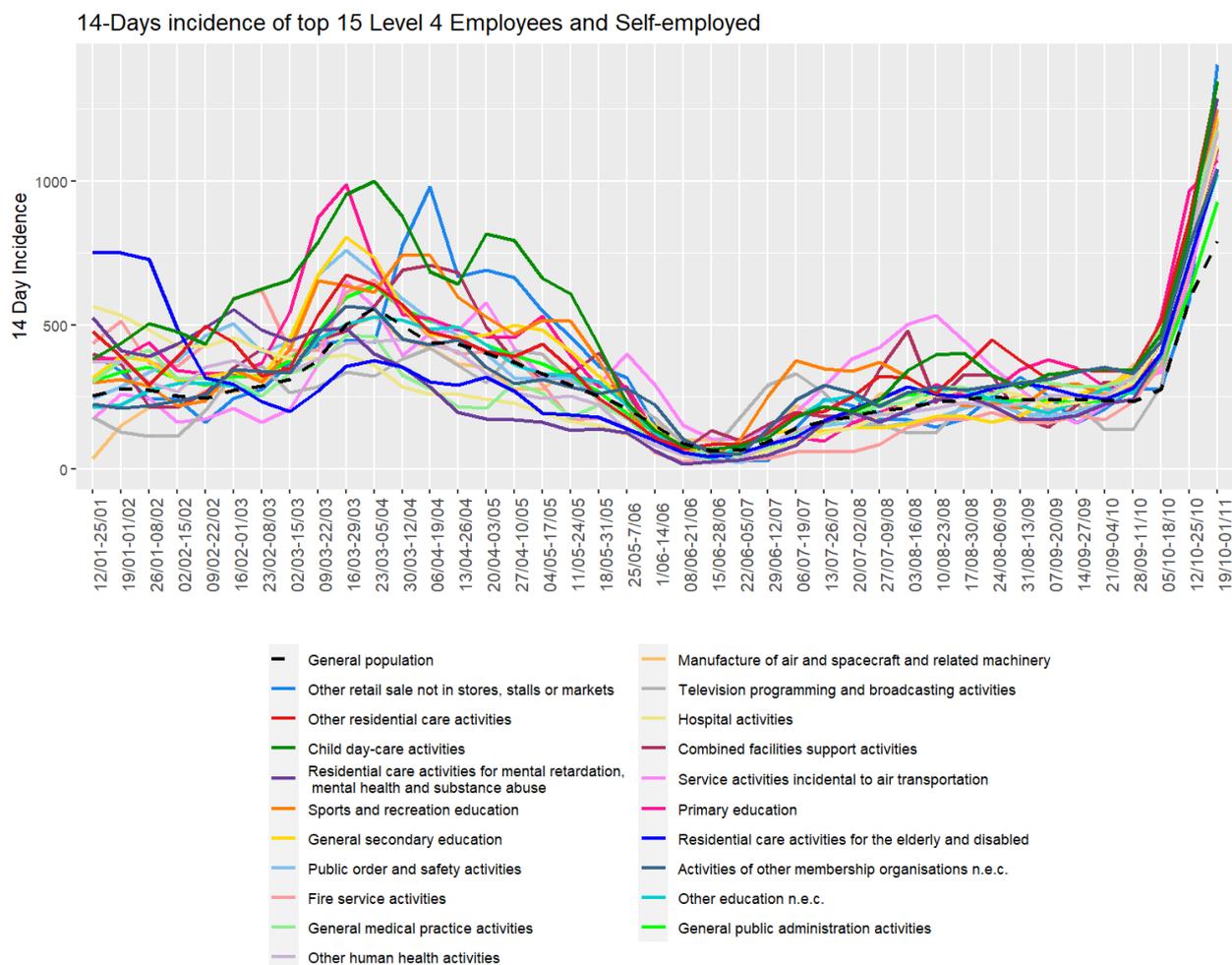


Figure 5: 14-Day incidence of COVID-19 infection in sectors with the highest incidence at Level 4 in both employees and self-employed

Table 4: 14-Day incidence of COVID-19 infection in sectors with the highest incidence at Level 4 on 1 November 2021

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
Other retail sale not in stores, stalls or markets	4799	4270	1405(1092;1805)		1500(1145;1963)	81.12
Other residential care activities	8790	16383	1349(1183;1538)	1367(1197;1560)		3.56
Child day-care activities	8891	28582	1347(1220;1487)	1310(1181;1453)	1901(1361;2649)	6.31
Residential care activities for mental retardation, mental health and substance abuse	8720	41570	1287(1183;1400)	1301(1196;1416)		1.82
Sports and recreation education	8551	9744	1252(1049;1493)		1216(1006;1469)	89.97
General secondary education	8531	402208	1223(1189;1257)	1224(1190;1258)		0.16
Public order and safety activities	8424	53657	1217(1128;1313)	1217(1128;1313)		0.18
Fire service activities	8425	18672	1205(1058;1372)	1205(1058;1372)		0.12
General medical practice activities	8621	16851	1175(1023;1349)	1128(957;1329)	1311(1013;1696)	26.34
Other human health activities	8690	54195	1168(1081;1262)	1049(937;1174)	1300(1168;1446)	47.75
Manufacture of air and spacecraft and related machinery	3030	5073	1163(902;1498)	1151(889;1489)		2.37
Television programming and broadcasting activities	6020	8171	1126(919;1379)	1116(907;1372)		2.38
Hospital activities	8610	214844	1125(1081;1170)	1125(1081;1171)		0.33
Combined facilities support activities	8110	6110	1113(878;1409)	1109(844;1456)	1124(700;1801)	24.75
Service activities incidental to air transportation	5223	7195	1098(882;1367)	1116(892;1395)		5.34
Primary education	8520	8186	1075(873;1323)	1060(851;1320)		9.01
Residential care activities for the elderly and disabled	8730	68300	1041(968;1120)	1048(974;1128)		1.30
Activities of other membership organisations n.e.c.	9499	27168	1038(924;1166)	1061(937;1202)	908(659;1251)	15.14
Other education n.e.c.	8559	38184	1024(928;1130)	902(793;1026)	1263(1084;1471)	34.12
General public administration activities	8411	344397	928(897;961)	927(896;960)		0.12
Working population		4506032	862(854;871)	862(854;871)		
General population			791	791	791	

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 1 November 2021 significantly higher than the working population average are: Mental health activities (sector 86904, 87201, 87202), Other retail sale not in stores, stalls or markets (sector 47990), Residential youth care (sector 87901), Nurseries and crèches (sector 88911), Secondary education (sector 85319, 85311), Other human health care (sector 86909), Sports and recreation education (sector 85510), Police and fire service (sector 84242, 84250, 84241), Outpatient rehabilitation activities (sector 86905), General medical practice (sector 86210), Youth work associations (sector 94991), Manufacture of air and spacecraft (sector 30300), General hospitals (sector 86101), Other education (sector 85599) and Television programming and broadcasting (sector 60200) (Table 5 and Figure 6).

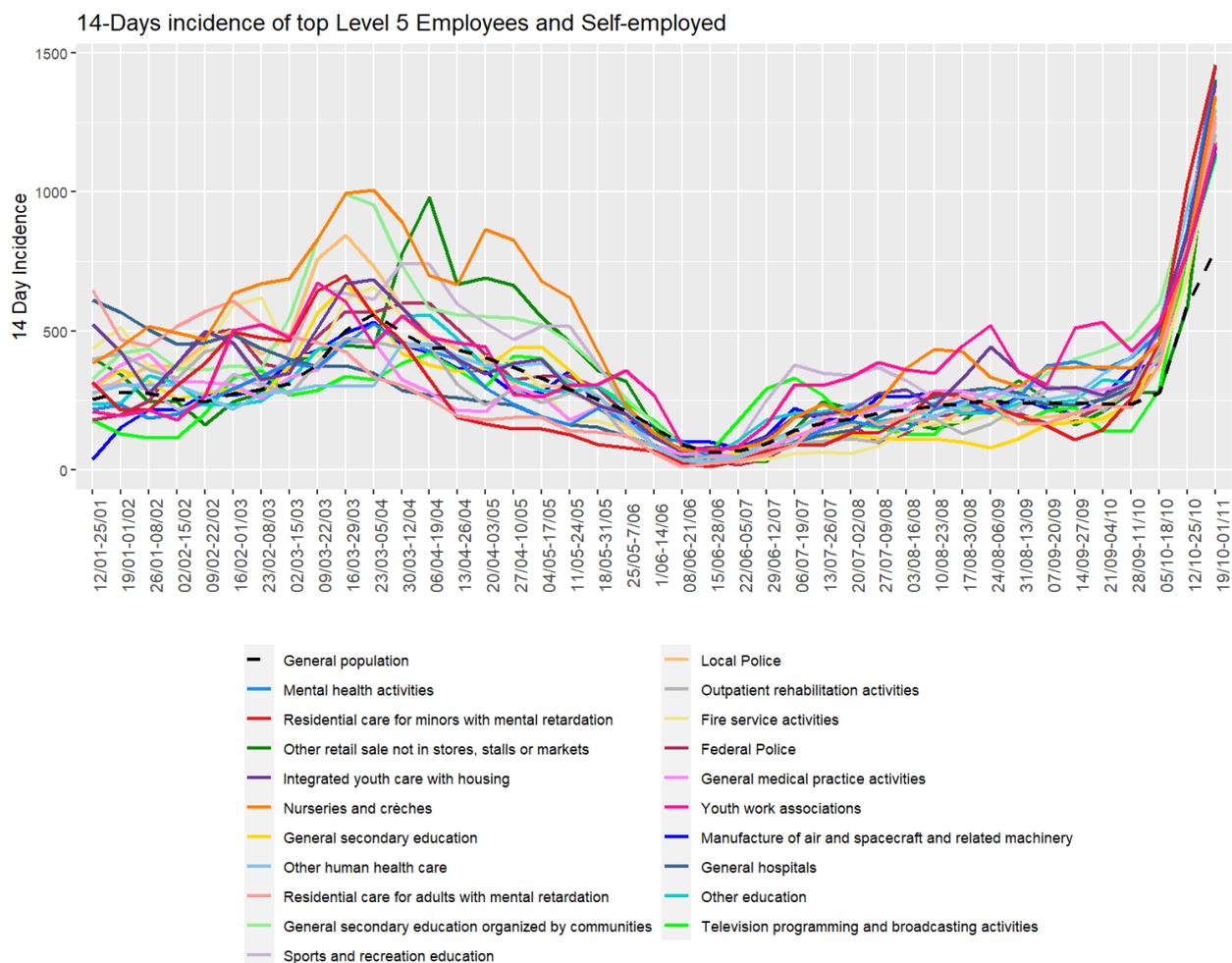


Figure 6: 14-Day incidence of COVID-19 infection in sectors with the highest incidence at Level 5 in both employees and self-employed

Table 5: 14-Day incidence of COVID-19 infection of sectors with the highest incidence at Level 5 on 1 November 2021

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
Mental health activities	86904	6923	1459(1202;1770)	1430(1076;1898)	1486(1140;1935)	53.65
Residential care for minors with mental retardation	87201	8935	1455(1226;1725)	1455(1226;1725)		1.27
Other retail sale not in stores, stalls or markets	47990	4270	1405(1092;1805)		1500(1145;1963)	81.12
Residential youth care	87901	12662	1390(1200;1609)	1414(1220;1639)		2.84
Nurseries and crèches	88911	25167	1347(1212;1497)	1312(1174;1466)	1855(1300;2641)	6.48
General secondary education	85319	206759	1302(1254;1352)	1302(1254;1352)		0.02
Other human health care	86909	11103	1297(1103;1525)		1297(1096;1534)	93.18
Residential care for adults with mental retardation	87202	27373	1275(1149;1415)	1286(1158;1428)		1.72
General secondary education organized by communities	85311	159602	1255(1202;1311)	1255(1202;1311)		0.01
Sports and recreation education	85510	9744	1252(1049;1493)		1216(1006;1469)	89.97
Local Police	84242	36511	1238(1130;1357)	1237(1129;1356)		0.11
Outpatient rehabilitation activities	86905	10818	1211(1021;1435)		1250(1036;1507)	80.34
Fire service activities	84250	18672	1205(1058;1372)	1205(1058;1372)		0.12
Federal Police	84241	17034	1180(1028;1354)	1180(1028;1354)		0.00
General medical practice activities	86210	16851	1175(1023;1349)	1128(957;1329)		26.34
Youth work associations	94991	5111	1174(913;1509)	1223(945;1582)		8.93
Manufacture of air and spacecraft and related machinery	30300	5073	1163(902;1498)	1151(889;1489)		2.37
General hospitals	86101	176708	1142(1094;1193)	1140(1091;1191)		0.26
Other education	85599	13228	1134(967;1329)	798(555;1146)	1262(1057;1506)	72.72
Television programming and broadcasting activities	60200	8171	1126(919;1379)	1116(907;1372)		2.38
Working population		4506032	862(854;871)	862(854;871)		
General population			791	791	791	

Finally, when considering specifically the non-medical contact professions, such as hairdressers and beauty saloons, we see a that the incidence in non-medical contact professions employees and self-employed follow the increasing trend (Figure 7).

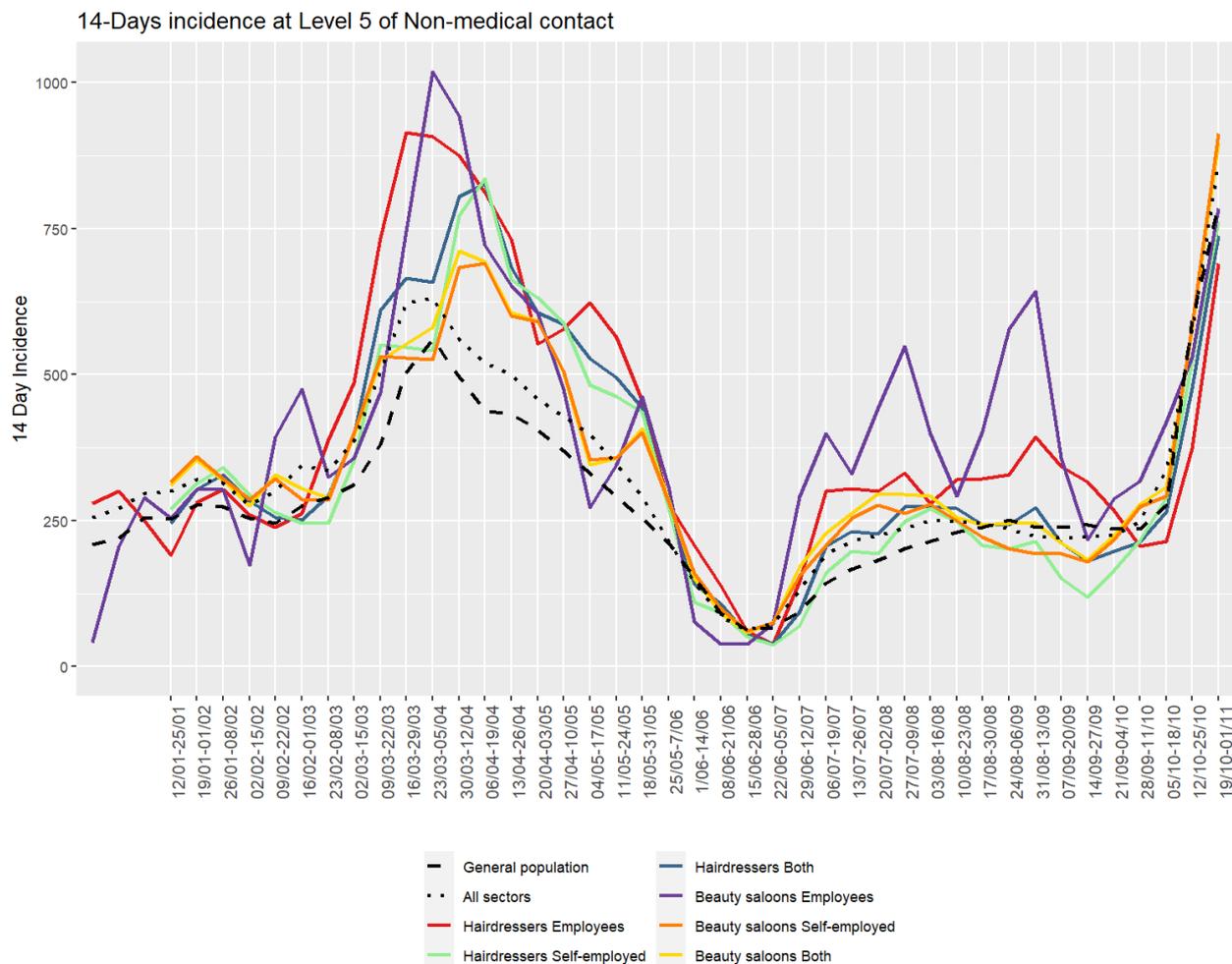


Figure 7: 14-Day incidence of COVID-19 infection at Level 5 of non-medical contact professions.

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 Education (sector P) is markedly elevated compared to the working and general population, mainly due to Primary and Secondary education (Figure 8).

Also, the incidence in the Human health and social work sector (sector Q) and Public administration and defence (sector O) is increased compared to the working and general population average. Elevated incidences are present in almost all subsectors of Human health (sector 86) and Residential care (Sector 87), additional to Child day-care activities (sector 8891). Additionally, elevated incidences are present in General public administration (sector 8411), Public order and safety (sector 8424) and Fire service (sector 8425) (Figure 8).

Although the 14-day incidence in Arts, entertainment and recreation (sector R) and Other service activities (sector S), is around the working population average, individual subsectors show an increased incidence. Youth work associations (sector 94991) and Other associations (sector 94999) show increased incidences compared to the working population.

The incidence in Transportation and storage (sector H) and Accommodation and food service activities (sector I) is significantly below the working population average, although the incidence in the Services to air transport (sector 5223), shows increased incidences compared to the working population.

The sectors Manufacturing (sector C) and Wholesale and retail trade (sector G) are sectors with the highest number of sublevels. In all manufacturing sectors the incidence is below or close to the working and population average, except for the manufacture of air and spacecraft machinery (sector 3030). In all subsectors of Sale of motor vehicles (sector 45) Wholesale (sector 46) and Retail sale (sector 47), the incidence is similar or below the working population average, except for the Other retail sale not in stores, stalls or markets (sector 4799) (Figure 8).

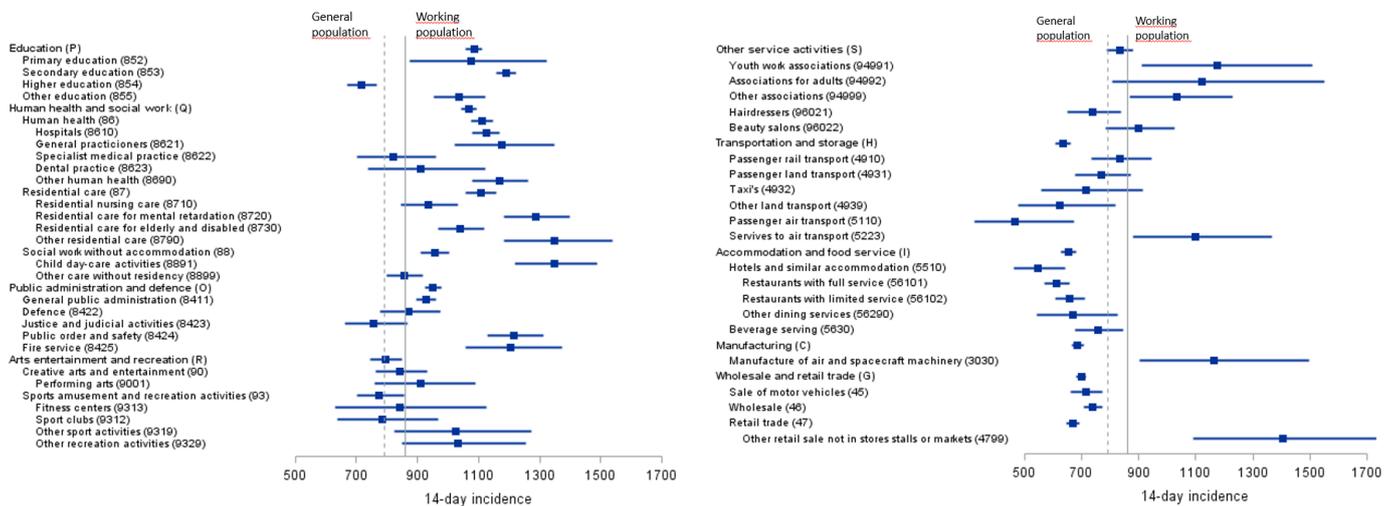


Figure 8: Forest plot of 14-Day incidence and 95% CI of selected sectors on 4 October 2021 in both employees and self-employed.

3.7 Contact tracing

In 2020–2021 about 800,000 employees are under medical surveillance of IDEWE. Among these, 24,382 COVID-19 index cases were registered between 22 July 2020 (week 30) and 28 October 2021, for whom the customer segment, region and the registration date are known for 24,080 index cases.

Since October the 14-day incidence is rising rapidly to 244 in 14 days per 100.000 on 26 October (Figure 9). The increase is highest in the education segment (769 index cases per 100,000) and is present in all regions. The regions with the highest incidences are Turnhout (473 cases per 100,000) and Hasselt (362 cases per 100,000).

Note that two factors, mentioned above, may cause bias in the figures: employees of some large companies are not included and beside employees, external persons are also registered as an index case. Especially students and pupils may influence the figures of Education.

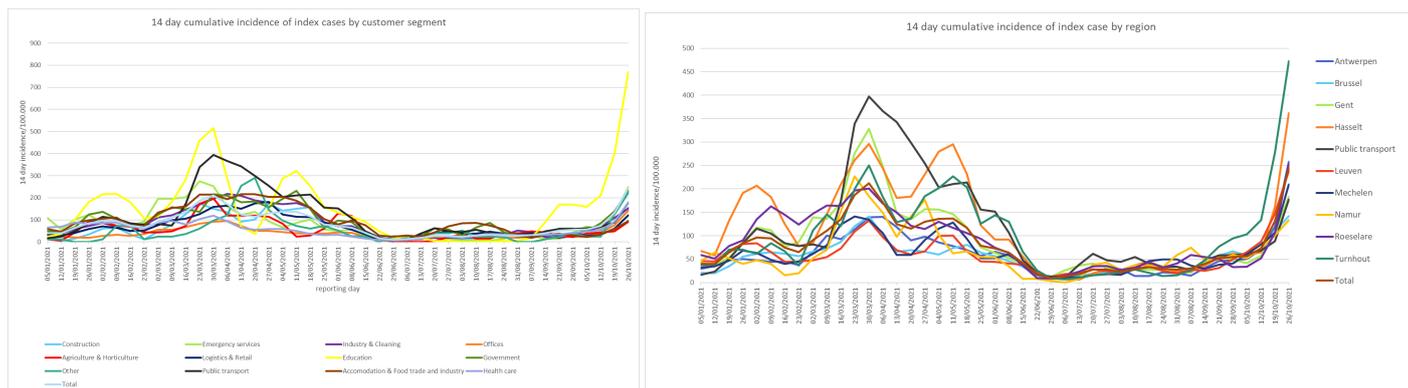


Figure 9: 14-Day incidence of index cases by segments under surveillance (left) and by region (right)

Since the establishment of the tracing app on 29 October 2020, there are 18,116 index cases of whom high-risk contacts were recorded. Of 17,969 index cases, the customer segment and region is known. The mean number of high-risk contacts in segment Education, Emergency services Public Transport and Government is above 1, while in the Hasselt region a higher mean number of high-risk contacts is reported in the period 29 October 2020–28 October 2021 (Figures 10).

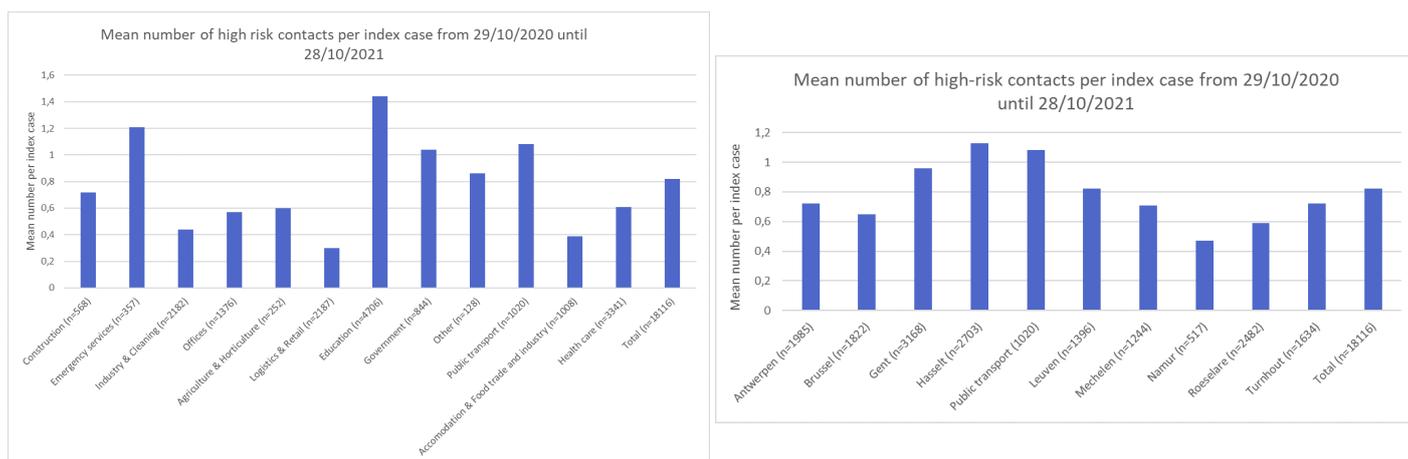


Figure 10: The mean number of high-risk contacts per index case by segments under surveillance (left) and by region (right)

The number of high-risk contacts per index case varies from 0 to 62, with more than 99% being lower than 10 high-risk contacts. Sixty-nine percent had 0 high risk contacts. A sole high number of high-risk contact for an index will influence the mean number for a segment importantly, especially when groups are small. To avoid extremely high numbers of contacts influencing results, we report the percentage of index cases who had two or more high-risk contacts per four weeks.

The percentage of index cases with two or more high-risk contacts is strongly increasing in all segments and in all regions in the most recent period (29 September– 28 October 2021), reflecting the changed behavior on the work floor, after alleviation of mitigation measures (Figure 11).

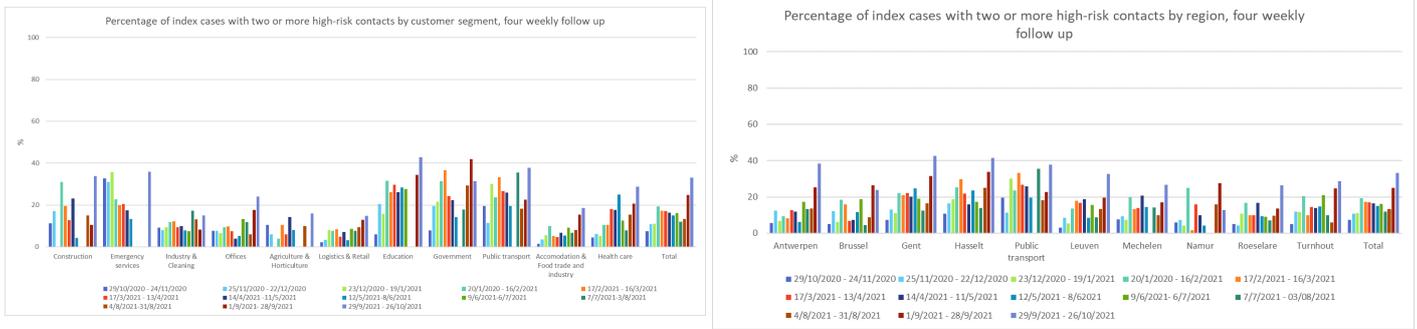


Figure 11: Four weekly percentage of index cases with two or more high-risk contacts by segments under surveillance (left) and by region (right)

Since 11 March 2021, index cases are asked if they contracted COVID-19 during work and if they did, which were the circumstances or the source of the infection. Note that pupils and other external index cases were left out of the following analyses.

From 9,041 index cases, we have information about perceived work relatedness of the source of infection. While 39% of the index cases does not know whether the infection took place at work, 19% responded that they were certainly or probably infected at work (Figure 12 left). From 2,725 (30%) of the index cases that answered they were certainly, probably, or possibly infected at work, further information was obtained on how the infection took place (Figure 12 right). A majority of the index cases (62%) indicates to know the source of infection at work.

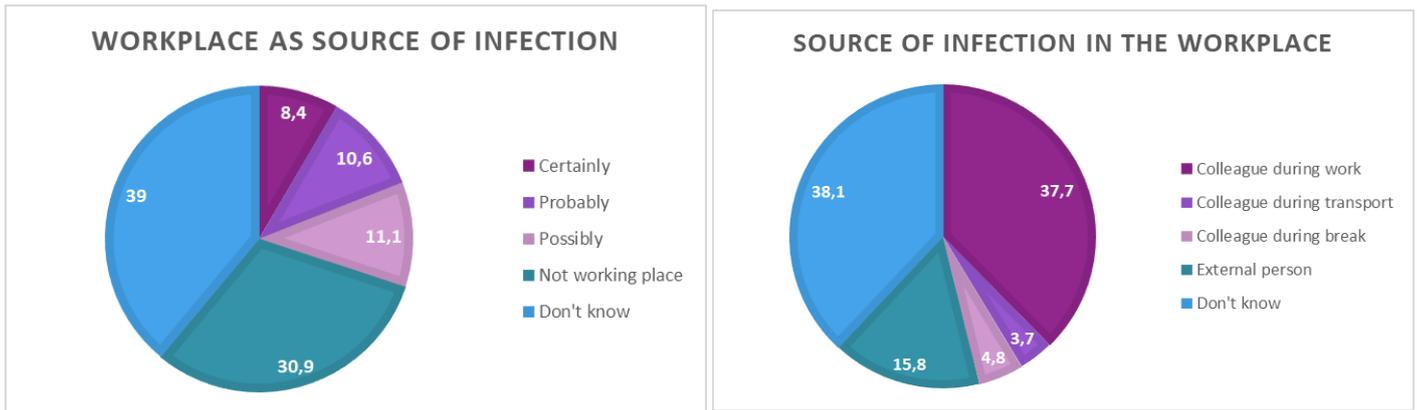


Figure 12: Distribution of the probability and source of infection at work by index case

In the education segment 37% of the cases are attributable to pupils (Figure 13 left). The interpretation of these data should be undertaken, however, with caution. Index cases in schools, both pupils and teachers, are reported to IDEWE by CLBs and schools in order to reach high-risk contacts among teachers and provide them with prescriptions for PCR tests and quarantine. The working method is, however, not the same for all CLBs and schools and therefore notification of index cases may differ between CLBs and regions. Moreover, index cases with only low risk contacts are often not reported to our service, because they do not need prescriptions for tests or quarantine. This might lead to an underestimation of index cases among pupils and teachers. Note that pupils are tested on a larger scale since January 2021.

Since the tracing app came in use, the social security number of most index cases is registered. Age is calculated from the social security number and is available for most index cases. In contrast to the previous school year 2020, the majority of the index cases (80%) in school year 2021 is aged under 12 years (and unvaccinated) (Figure 13 right). Note that some type of schools might be over- or underrepresented in comparison to the Belgian school landscape, as a result of which the proportion of age groups might not be representative for the Belgian school population. Before 20 January 2021, biweekly numbers of cases are too small to allow for an interpretation, as well as the period 31 March–13 April 2021 and 9 June–6 July 2021.

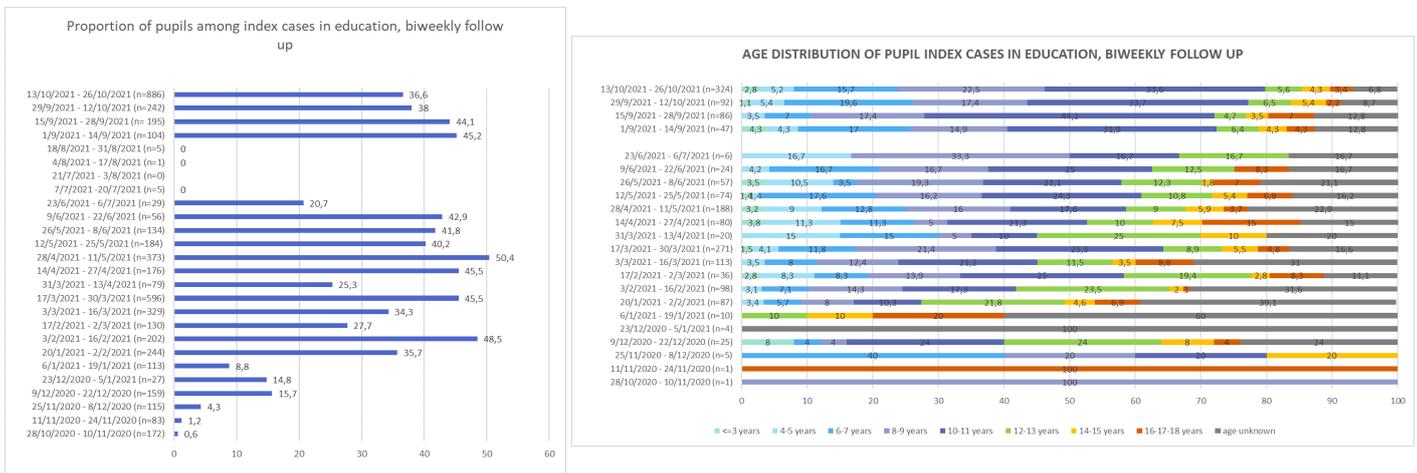


Figure 13: The evolution of index cases of pupils in school (left) and their age distribution (right).

Since 7 June 2021, the vaccination status of index cases is registered, with the type of vaccine if applicable. Because of the large number of index cases since October 2021, it is no longer possible to check the vaccination status of index cases in Vaccinnet. Therefore, self-reported vaccination data are reported and vaccine-effectiveness is no longer calculated, as self-reported data are incomplete and possibly incorrect.

From 3,705 adult index cases we had information about their vaccination status: 2,752 were partially or completely vaccinated (1,742 Cominarty, 496 Vaxzevria, 156 Moderna and 178 Johnson % Johnson and 162 did not know the type of vaccine.) (Figure 14 left). With a vaccination coverage in the working population of 85% since September 2021 (data derived from Sciensano), it is important to evaluate these breakthrough index cases. Vaccination coverage of the population changed rapidly from June until September and is reaching a plateau since that time. The amount of index cases who received only one dose or who became infected within 15 days after their last vaccination dose made up the majority of vaccinated cases until August 2021 and drops to 1% in October 2021. As a consequence most index cases are expected to be fully vaccinated (Figure 14 left).

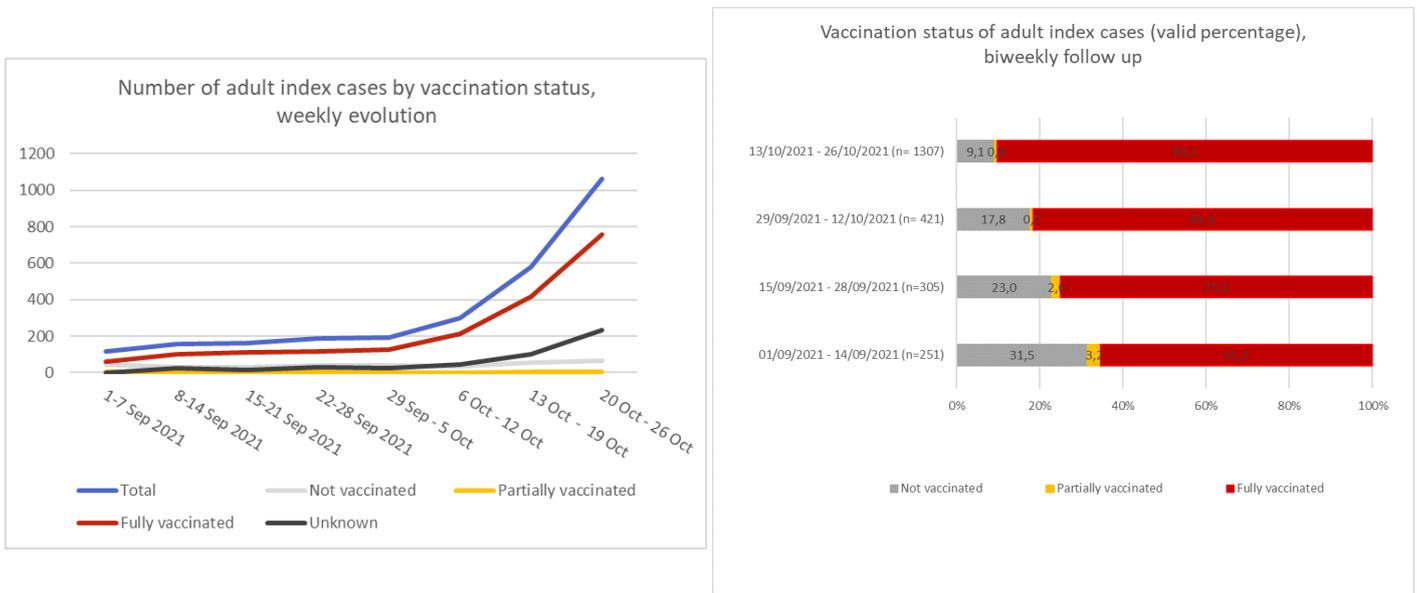


Figure 14: The weekly evolution of index cases and their vaccination status (left) and biweekly evolution of the self-reported vaccination status of index cases (right).

4 Conclusion

Despite the limitations of the data, both the contact tracing as the RSZ/ONSS data demonstrates a sharp increase of the 14-day COVID-19 incidences in the last 3 weeks in most sectors, well above the incidences seen in the March-May wave in 2021. The highest incidences are present in education, health care and residential care, Public order and safety and the fire service. As a result of the increase in these large sectors, the incidence in the general population is below the incidence in the working population, despite a large proportion of

incidences in the general population is coming from children. Vigilance is required in sectors with close contact to young children, and in those sectors where workers are exposed to high-risk close physical proximity, and where climate conditions are difficult to control.

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 shows that in the index cases, where this information was available, 8% indicated that the workplace was certainly the source of infection.

It is clear that in most sectors at level 1 the 14-day incidence follows the sharply increasing pattern that is observed in the working population. The contact tracing shows a larger increase in incidences in the education segment since the start of the school year, likely due to the presence of cases in children in the contact tracing, while the RSZ data concerns only employees.

With an increased circulation of the delta variant of concern of SARS-CoV-2, it is important to carefully monitor incidence of COVID-19 in the sectors with high-risk, multiple close physical proximity, especially with younger, not yet vaccinated individuals. Youth work associations, Other associations, Primary and secondary education, Nurseries and crèches, Health care and Residential care sectors, all show higher incidences and require careful attention. Especially in the context of increased high-risk contacts, as shown by the contact tracing.

In sectors with multiple close physical proximity under increasing circulation of SARS-CoV-2 it may be worthwhile to re-evaluate hygiene protocols, as incidences are increased compared to the working population average in Public order and safety, Fire services and General public administration.

For some sectors the reason for the higher incidences is not immediately obvious, such as Television programming and broadcasting activities, Services to air transport, Manufacture of air and spacecraft machinery and Other retail sale not in stores, stalls or markets. It would be worthwhile to evaluate the hygiene protocols and its practice in these sectors.

It is encouraging to note that employees in most manufacturing, retail and wholesale sectors are well protected, as they are often not able to telework. Also, the hygiene protocols in sports, amusement and recreation (sector R), Transportation (sector H) and accommodation and food service (sector I) seem to protect employees sufficiently under current increased circulation of SARS-CoV-2.

Finally, despite the high degree of vaccination, COVID-19 infection remains possible. Continuous monitoring of breakthrough infections and especially protection against hospitalization is warranted.

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