

# 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. 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 (28 December 2021 – 11 January 2022) and presented together with the COVID-19 14-day incidence over all work sectors ( $\sim 4.5$  million individuals) and the COVID-19 14-day incidence in the general population ( $\sim 11.5$  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 2020–6 January 2022) 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 20 sectors at level 1, the sectors with a 14-day incidence on 11 January 2022 significantly above the working population average are Arts, entertainment and recreation (sector R), Information and communication (sector J), Professional, scientific and technical activities (sector M) and Accommodation and food service activities (Table 1 and Figure 1). The 14-day incidences sharply increases again with an average 14-day incidence in the working population that is almost twice the average in the general population.

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

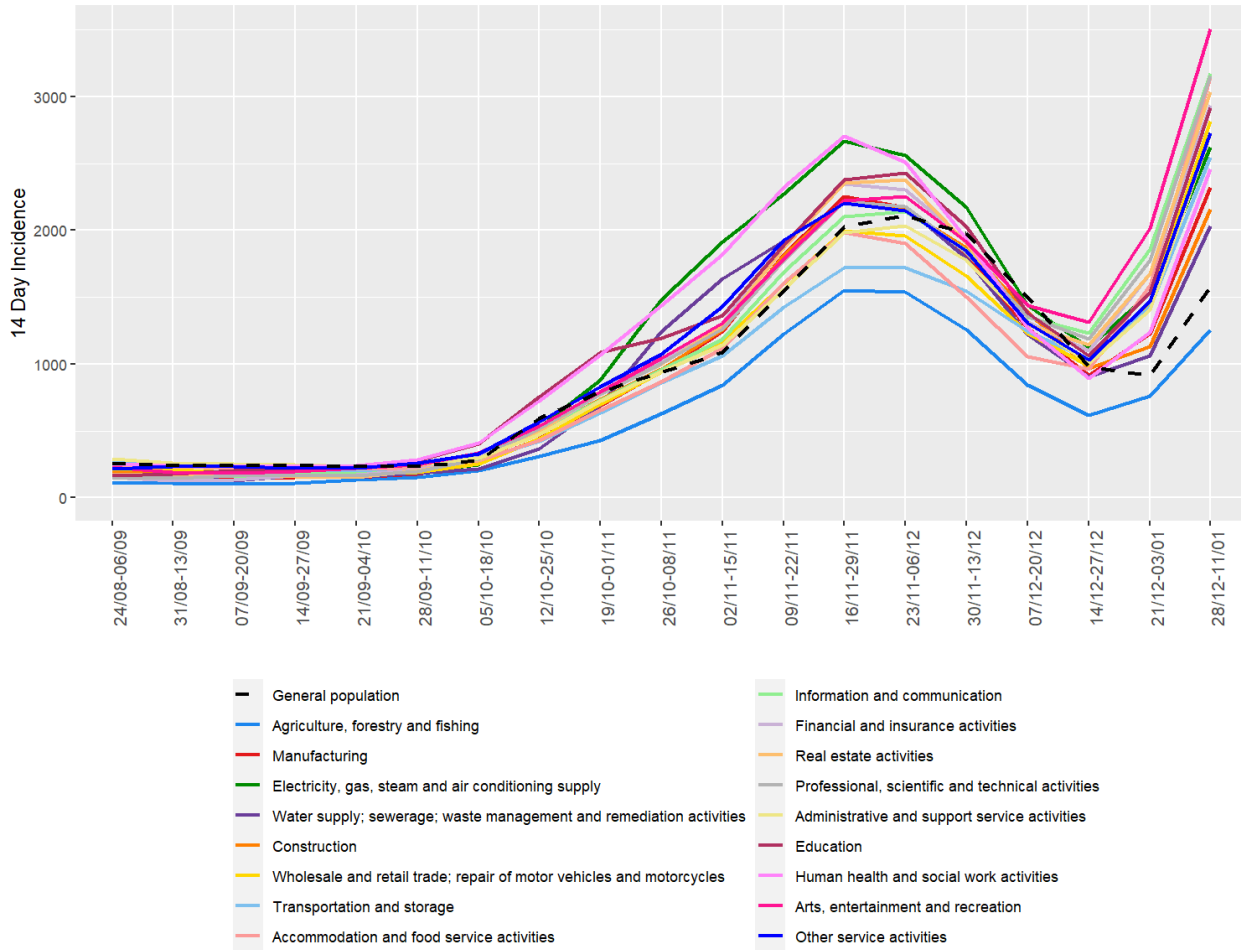


Figure 1: 14-Day incidence of COVID-19 infection of 20 sectors at Level 1 in both employees and self-employed workers

Table 1: 14-Day incidence of COVID-19 infection of 20 sectors at Level 1 on 11 January 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
Arts, entertainment and recreation	R	99743	3505(3393;3621)	3942(3789;4101)	2849(2690;3017)	41.36
Information and communication	J	184741	3172(3093;3253)	3356(3260;3455)	2730(2596;2870)	30.11
Professional, scientific and technical activities	M	396355	3155(3101;3210)	3475(3398;3554)	2792(2718;2868)	47.57
Accommodation and food service activities	I	293253	3142(3079;3206)	3454(3379;3531)	2158(2053;2268)	25.18
Real estate activities	L	58775	3037(2901;3179)	3320(3105;3549)	2828(2656;3010)	58.42
Financial and insurance activities	K	160797	2936(2855;3020)	3052(2958;3149)	2523(2364;2692)	22.20
<b>Working population</b>		<b>4586294</b>	<b>2933(2918;2948)</b>	<b>2933(2918;2948)</b>		
Education	P	718288	2920(2881;2959)	2922(2883;2962)	2854(2659;3063)	3.76
Wholesale and retail trade; repair of motor vehicles and motorcycles	G	850053	2817(2782;2852)	3003(2962;3044)	2164(2099;2231)	22.74
Other service activities	S	161127	2732(2654;2813)	3107(2991;3227)	2336(2232;2444)	49.61
Administrative and support service activities	N	441557	2724(2676;2772)	2774(2721;2828)	2495(2389;2606)	18.42
Electricity, gas, steam and air conditioning supply	D	21418	2624(2418;2847)	2627(2415;2857)		6.18
Transportation and storage	H	313344	2548(2493;2604)	2584(2526;2643)	2183(2020;2359)	9.28
Human health and social work activities	Q	663917	2461(2424;2499)	2486(2447;2525)	2178(2058;2305)	8.40
Manufacturing	C	623355	2325(2288;2363)	2335(2296;2375)	2235(2124;2352)	10.46
Public administration and defence; compulsory social security	O	574120	2245(2207;2284)	2246(2208;2285)		0.19
Construction	F	381140	2158(2112;2205)	2209(2149;2270)	2082(2012;2155)	41.27
Water supply; sewerage; waste management and remediation activities	E	36252	2033(1893;2183)	2045(1900;2201)		6.57
<b>General population</b>			<b>1574</b>	<b>1574</b>	<b>1574</b>	
Agriculture, forestry and fishing	A	78708	1254(1179;1334)	1241(1114;1383)	1260(1168;1359)	67.71

### 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 11 January 2022 significantly higher than the working population average are: Air transport (sector 51), Motion picture, video and television activities (sector 59, 60), Creative, arts and entertainment activities (sector 90), Sports activities (sector 93), Office activities (sector 73, 69, 63, 70, 82, 78, 62, 71), Manufacture of wearing apparel (sector 14), Security and investigation activities (sector 80), Activities of membership organisations (sector 94) and Food and beverage service activities (sector 56) (Table 2 and Figure 2).

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

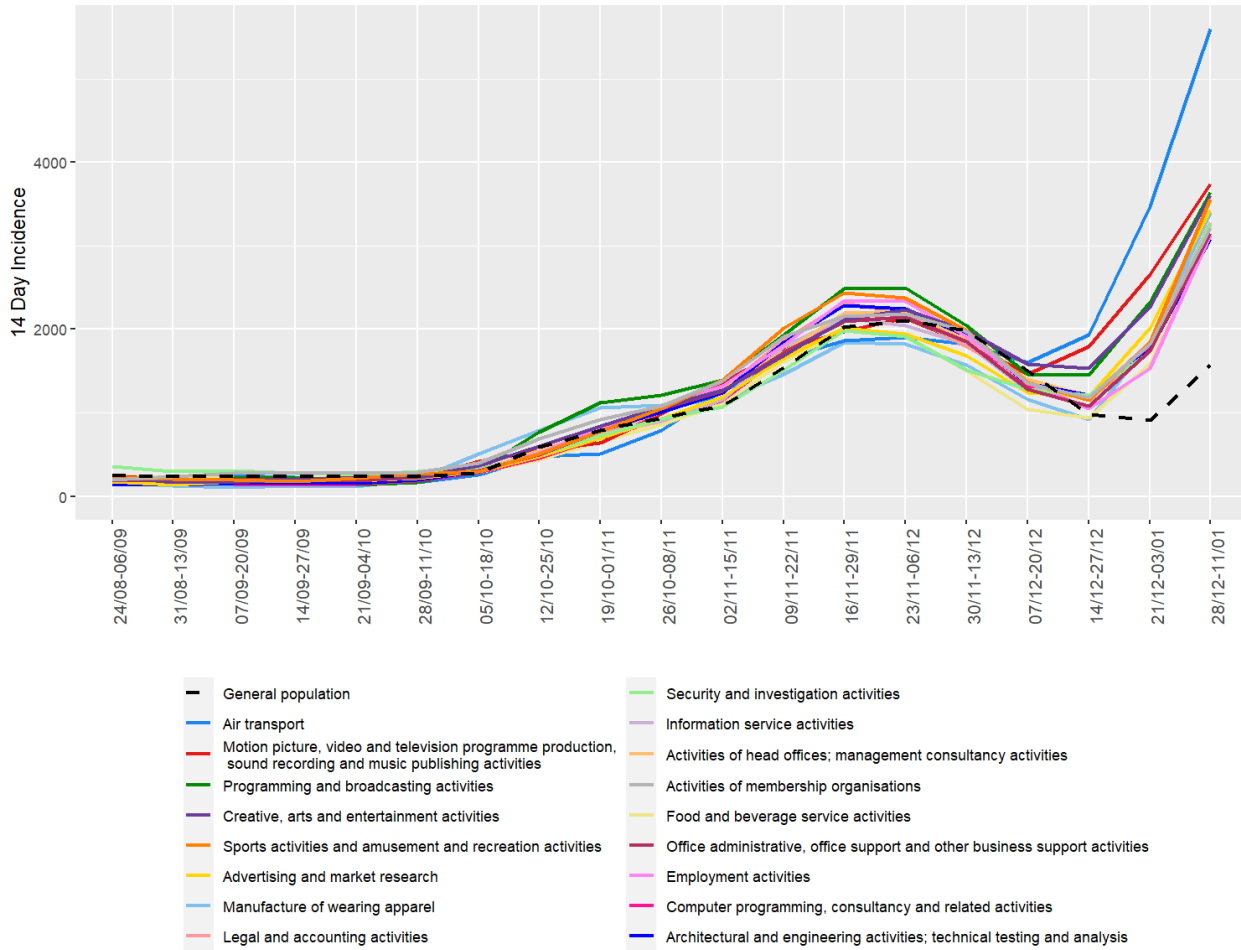


Figure 2: 14-Day incidence of COVID-19 infection in sectors with the highest incidence at Level 2 in both employees and self-employed workers

Table 2: 14-Day incidence of COVID-19 infection in sectors with the highest incidence at Level 2 on 11 January 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
Air transport	51	6701	5596(5070;6172)	5805(5250;6414)		7.24
Motion picture, video and television programme production, sound recording and music publishing activities	59	14160	3743(3443;4069)	4072(3671;4514)	3253(2822;3747)	42.13
Programming and broadcasting activities	60	8766	3639(3267;4052)	3681(3298;4107)		4.90
Creative, arts and entertainment activities	90	40934	3596(3420;3781)	4298(4034;4579)	2835(2612;3077)	50.21
Sports activities and amusement and recreation activities	93	46147	3556(3391;3729)	4064(3834;4307)	2856(2631;3100)	43.03
Advertising and market research	73	30933	3430(3233;3639)	4122(3832;4433)	2599(2348;2876)	46.03
Manufacture of wearing apparel	14	5350	3402(2948;3923)		3675(2991;4508)	44.82
Legal and accounting activities	69	77876	3277(3154;3404)	3372(3204;3548)	3164(2987;3352)	46.13
Security and investigation activities	80	21531	3265(3036;3511)	3309(3072;3563)		5.23
Information service activities	63	18377	3254(3007;3521)	3433(3100;3801)	3021(2667;3420)	43.50
Activities of head offices; management consultancy activities	70	138256	3223(3131;3317)	3923(3773;4079)	2657(2545;2773)	55.63
Activities of membership organisations	94	59115	3209(3070;3354)	3363(3208;3526)	2423(2135;2749)	16.79
Food and beverage service activities	56	259225	3149(3082;3217)	3477(3396;3559)	2170(2061;2285)	26.23
Office administrative, office support and other business support activities	82	74714	3148(3025;3276)	3477(3306;3657)	2728(2557;2910)	44.17
Employment activities	78	81458	3128(3011;3250)	3147(3027;3272)	2648(2138;3276)	3.82
Computer programming, consultancy and related activities	62	113034	3115(3015;3218)	3384(3258;3515)	2554(2397;2721)	33.01
Architectural and engineering activities; technical testing and analysis	71	89708	3080(2969;3195)	3160(3016;3311)	2960(2789;3141)	40.31
<b>Working population</b>		<b>4586294</b>	<b>2933(2918;2948)</b>	<b>2933(2918;2948)</b>		
<b>General population</b>			<b>1574</b>	<b>1574</b>	<b>1574</b>	

### 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 11 January 2022 significantly higher than the working population average are: Passenger air transport (sector 511), Activities of call centres (sector 822), Motion picture, television and broadcasting (sector 591, 602), Sports activities (sector 931), Residential care (sector 879), Advertising, real estate, Financial services, management consultancy, data processing, accounting, legal, design, employment, architectural, engineering and computer activities (sector 731, 683, 661, 649, 631, 692, 702, 691, 741, 782, 711, 620), Creative, arts and entertainment

(sector 900), Organisation of conventions and trade shows (sector 823), Other membership organisations (sector 949), Horeca (sector 551, 563, 561), Wireless telecommunication (sector 612), Retail trade (sector 477, 479), Private security (sector 801) and Amusement and recreation (sector 932), Design activities (sector 741) (Figure 4) (Table 3 and Figure 3).

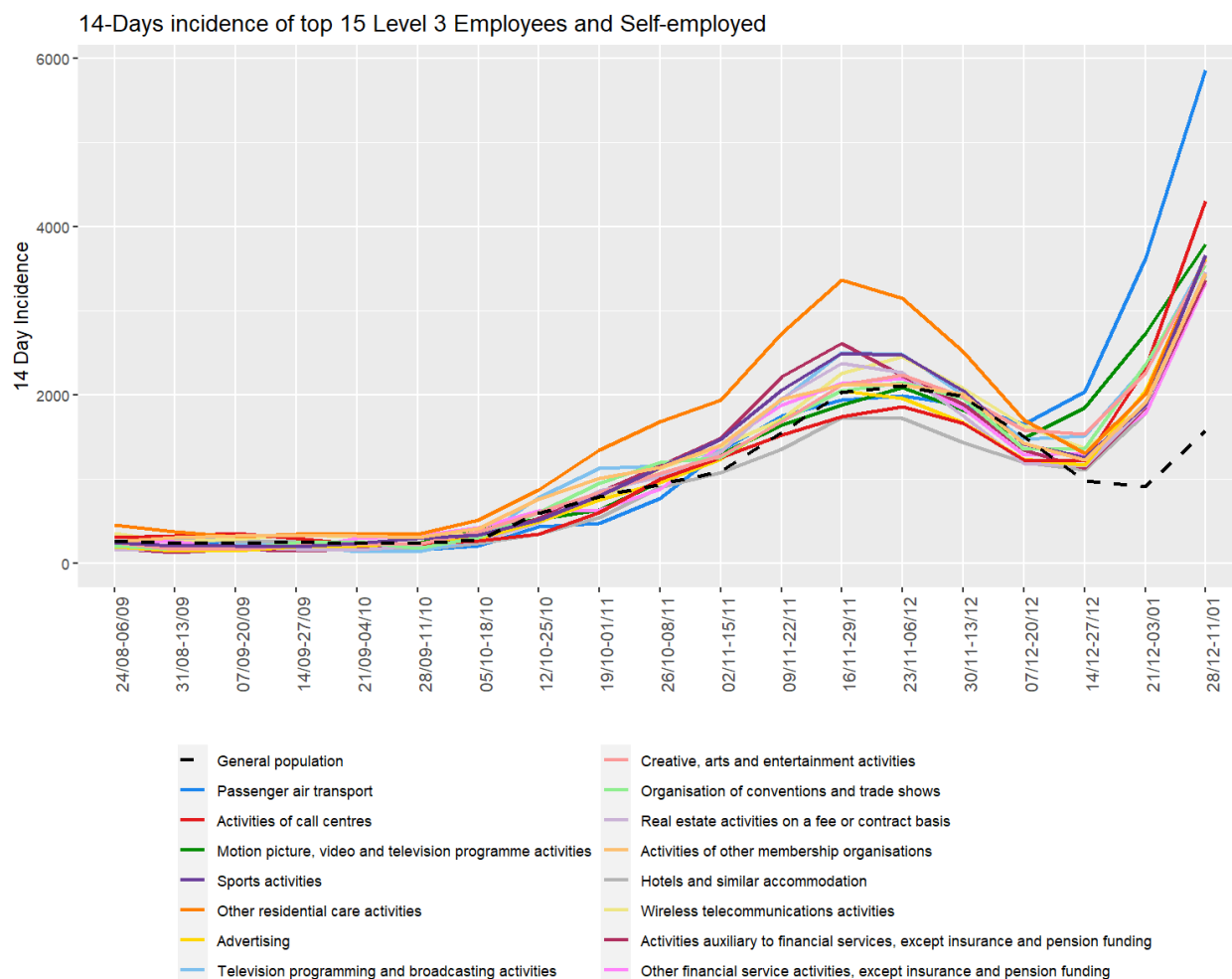


Figure 3: 14-Day incidence of COVID-19 infection in sectors with the highest incidence at Level 3 in both employees and self-employed

14-Days incidence Education per Level 3 Sector

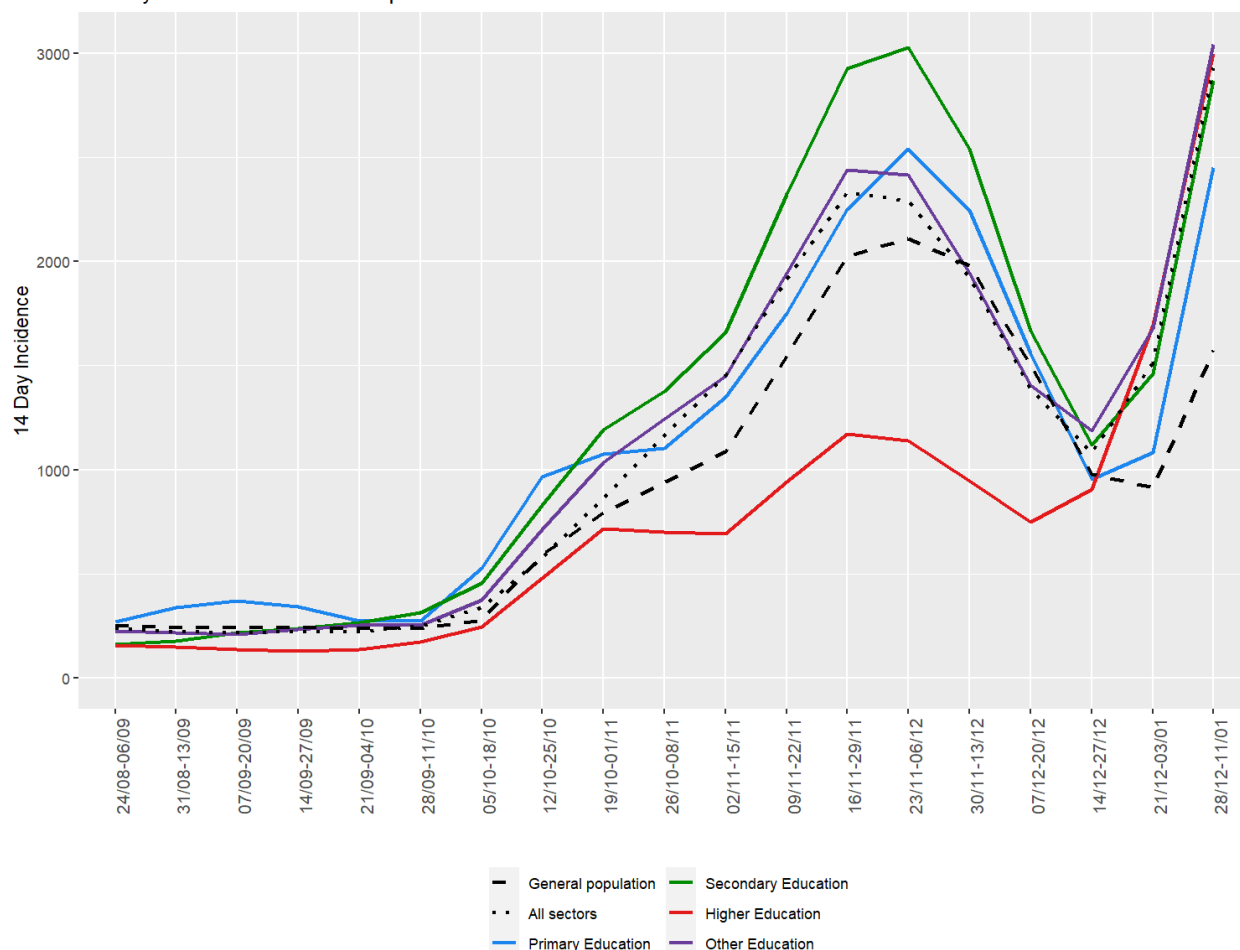


Figure 4: 14-Day incidence of COVID-19 infection in Education sectors at Level 3 in both employees and self-employed

Table 3: 14-Day incidence of COVID-19 infection in sectors with the highest incidence at Level 3 on 11 January 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
Passenger air transport	511	5973	5860(5292;6485)	6114(5512;6777)		7.48
Activities of call centres	822	12822	4305(3967;4670)	4339(3997;4709)		1.70
Motion picture, video and television programme activities	591	12493	3786(3465;4135)	4160(3744;4620)	3120(2650;3671)	37.82
Sports activities	931	34389	3664(3471;3868)	4170(3912;4445)	2807(2534;3108)	38.06
Other residential care activities	879	16685	3650(3376;3945)	3682(3402;3984)		3.50
Advertising	731	23422	3612(3380;3859)	4249(3918;4606)	2785(2483;3123)	44.24
Television programming and broadcasting activities	602	8114	3611(3226;4040)	3649(3258;4085)		2.40
Creative, arts and entertainment activities	900	40934	3596(3420;3781)	4298(4034;4579)	2835(2612;3077)	50.21
Organisation of conventions and trade shows	823	8940	3546(3182;3950)		3441(2965;3991)	55.01
Real estate activities on a fee or contract basis	683	26940	3467(3255;3692)	3657(3340;4003)	3306(3028;3609)	55.60
Activities of other membership organisations	949	35434	3443(3258;3638)	3552(3351;3765)	2724(2294;3232)	13.57
Hotels and similar accommodation	551	24035	3420(3198;3657)	3598(3356;3856)	1993(1526;2600)	11.29
Wireless telecommunications activities	612	8773	3374(3016;3773)	3346(2959;3781)	3520(2670;4627)	15.89
Activities auxiliary to financial services, except insurance and pension funding	661	19256	3360(3115;3624)	3701(3405;4021)	2333(1942;2800)	25.50
Other financial service activities, except insurance and pension funding	649	7524	3336(2953;3766)	3704(3251;4218)	2013(1435;2818)	21.86
Data processing, hosting and related activities; web portals	631	14256	3318(3036;3625)	3400(3052;3786)	3161(2705;3691)	34.23
Accounting, bookkeeping and auditing activities; tax consultancy	692	36817	3292(3115;3479)	3740(3506;3989)	2483(2230;2764)	36.30
Retail trade not in stores, stalls or markets	479	18475	3291(3043;3558)		3191(2908;3501)	73.43
Management consultancy activities	702	110107	3285(3181;3392)	4530(4321;4748)	2669(2555;2788)	67.26
Private security activities	801	20098	3279(3042;3534)	3298(3056;3558)		3.20
Legal activities	691	41153	3261(3094;3437)	2907(2676;3157)	3559(3324;3810)	54.88
Specialised design activities	741	11785	3250(2945;3586)		3151(2820;3519)	82.39
Amusement and recreation activities	932	12072	3239(2938;3570)	3613(3135;4160)	2964(2590;3390)	58.26
Beverage serving activities	563	35861	3218(3040;3406)	4033(3758;4327)	2359(2144;2595)	49.23
Temporary employment agency activities	782	34800	3181(3002;3371)	3202(3021;3394)		1.46
Retail sale of other goods in specialised stores	477	137004	3178(3086;3272)	3602(3487;3721)	2125(1987;2272)	29.21
Restaurants and mobile food service activities	561	197699	3172(3096;3250)	3469(3379;3562)	2135(2004;2274)	23.11
Architectural and engineering activities and related technical consultancy	711	71212	3168(3042;3299)	3344(3165;3532)	2979(2804;3164)	48.57
Computer programming, consultancy and related activities	620	113034	3115(3015;3218)	3384(3258;3515)	2554(2397;2721)	33.01
<b>Working population</b>		<b>4586294</b>	<b>2933(2918;2948)</b>	<b>2933(2918;2948)</b>		
<b>General population</b>			<b>1574</b>	<b>1574</b>	<b>1574</b>	



### 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 11 January 2022 significantly higher than the working population average are: Passenger air transport and services (sector 5110, 5223), Sports activities (sector 9313, 9312, 9319), Activities of call centres (sector 8220), Retail and wholesale (sector 4775, 4771, 4764, 4777, 4791, 4642, 4772), Employment agencies (sector 7830, 7820), Activities of extraterritorial organisations and bodies (sector 9900), Activities of other membership organisations (sector 9499), Motion picture, television and broadcasting (sector 5911, 6020), Real estate agencies (sector 6831), Art sector (sector 9004, 9001, 9003, 9002), Other residential care (sector 8790), Education (sector 8551, 8542), Credit granting, financial services, accounting (sector 6492, 6619, 6920), Advertising (sector 7311), Organisation of conventions and trade shows (sector 8230), Public relation (sector 7021), Other amusement and recreation (sector 9329), Horeca (sector 5510, 5630, 5610), Child day-care (sector 8891), Wireless telecommunication (sector 6120), Architectural activities (sector 7111), Private security (sector 8010), Computer and business consultancy (sector 6202, 7022), Legal activities (sector 6910) and Specialized designers (sector 7410) (Table 4 and Figure 5).

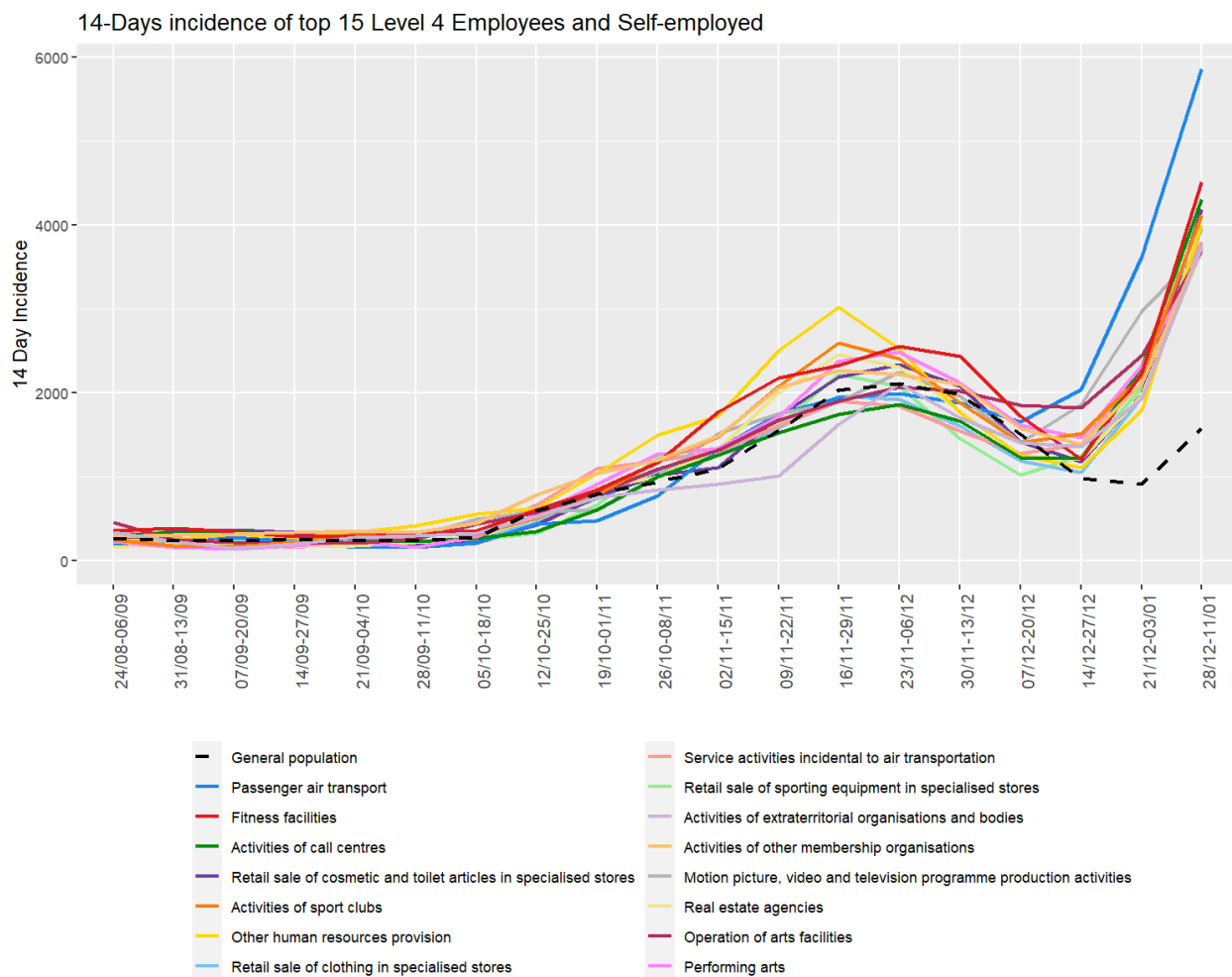


Figure 5: 14-Day incidence of COVID-19 infection in sectors with the highest incidence at Level 4 in both employees and self-employed

Table 4: 14-Day incidence of COVID-19 infection in sectors with the highest incidence at Level 4 on 11 January 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
Passenger air transport	5110	5973	5860(5292;6485)	6114(5512;6777)		7.48
Fitness facilities	9313	5498	4511(3993;5093)	4805(4197;5496)		24.50
Activities of call centres	8220	12822	4305(3967;4670)	4339(3997;4709)		1.70
Retail sale of cosmetic and toilet articles in specialised stores	4775	10165	4191(3818;4598)	4569(4139;5041)	2561(1941;3373)	32.10
Activities of sport clubs	9312	10485	4120(3756;4518)	5321(4777;5923)	2562(2142;3062)	44.20
Other human resources provision	7830	4698	4002(3478;4602)	4137(3577;4781)		9.94
Retail sale of clothing in specialised stores	4771	49735	3957(3789;4132)	4261(4068;4463)	2690(2385;3033)	19.57
Service activities incidental to air transportation	5223	7158	3800(3381;4269)	3824(3393;4308)		5.40
Retail sale of sporting equipment in specialised stores	4764	9115	3774(3402;4185)	3885(3474;4343)		16.44
Activities of extraterritorial organisations and bodies	9900	4041	3737(3194;4368)	3737(3193;4370)		0.67
Activities of other membership organisations n.e.c.	9499	27402	3726(3508;3957)	3896(3655;4152)	2750(2290;3299)	15.04
Motion picture, video and television programme production activities	5911	7819	3709(3312;4151)	4093(3553;4711)	3182(2635;3839)	43.96
Real estate agencies	6831	20627	3699(3450;3965)	4305(3877;4778)	3329(3032;3654)	62.74
Operation of arts facilities	9004	6034	3696(3248;4203)	4004(3489;4591)		19.28
Performing arts	9001	11728	3675(3349;4031)	4748(4198;5366)	2844(2470;3273)	58.03
Retail sale of watches and jewellery in specialised stores	4777	4393	3665(3148;4263)		3369(2682;4224)	48.98
Other residential care activities	8790	16685	3650(3376;3945)	3682(3402;3984)		3.50
Sports and recreation education	8551	9818	3626(3274;4014)		3465(3101;3870)	89.48
Other credit granting	6492	3559	3625(3059;4292)	3941(3319;4674)		10.16
Television programming and broadcasting activities	6020	8114	3611(3226;4040)	3649(3258;4085)		2.40
Advertising agencies	7311	20686	3558(3314;3819)	4230(3874;4617)	2749(2437;3100)	46.07
Organisation of conventions and trade shows	8230	8940	3546(3182;3950)	3672(3135;4297)	3441(2965;3991)	55.01
Artistic creation	9003	13062	3514(3212;3844)	3920(3488;4403)	3054(2651;3516)	48.84
Public relations and communication activities	7021	16805	3499(3232;3788)	4488(3931;5120)	3117(2822;3442)	72.31
Support activities to performing arts	9002	10908	3493(3164;3854)	4689(4099;5359)	2700(2334;3121)	61.20
Other amusement and recreation activities	9329	8880	3446(3086;3846)	4117(3463;4888)	3102(2688;3578)	66.84
Retail sale via mail order houses or via Internet	4791	14286	3444(3157;3756)	3789(3252;4411)	3301(2970;3668)	70.80
Hotels and similar accommodation	5510	24035	3420(3198;3657)	3598(3356;3856)	1993(1526;2600)	11.29
Child day-care activities	8891	28840	3398(3195;3613)	3397(3188;3620)	3411(2663;4360)	6.25
Wireless telecommunications activities	6120	8773	3374(3016;3773)	3346(2959;3781)		15.89
Wholesale of clothing and footwear	4642	9504	3367(3023;3749)	3622(3220;4072)	2454(1870;3215)	21.80
Retail sale of footwear and leather goods in specialised stores	4772	8801	3352(2996;3749)	3715(3290;4192)	2131(1584;2861)	22.97
Architectural activities	7111	27555	3346(3140;3565)	3451(2952;4031)	3326(3102;3565)	84.66
Other sports activities	9319	7750	3316(2940;3739)	3492(2936;4149)	3167(2678;3742)	55.10
Other activities auxiliary to financial services, except insurance and pension funding	6619	18742	3308(3061;3574)	3626(3329;3948)	2353(1955;2829)	25.53
Accounting, bookkeeping and auditing activities; tax consultancy	6920	36817	3292(3115;3479)	3740(3506;3989)	2483(2230;2764)	36.30
Private security activities	8010	20098	3279(3042;3534)	3298(3056;3558)		3.20
Computer consultancy activities	6202	58991	3270(3129;3417)	3734(3545;3933)	2506(2309;2720)	38.06
Legal activities	6910	41153	3261(3094;3437)	2907(2676;3157)	3559(3324;3810)	54.88
Specialised design activities	7410	11785	3250(2945;3586)		3151(2820;3519)	82.39
Business and other management consultancy activities	7022	95056	3236(3125;3350)	4536(4313;4770)	2584(2463;2711)	66.88
Beverage serving activities	5630	35861	3218(3040;3406)	4033(3758;4327)	2359(2144;2595)	49.23
Temporary employment agency activities	7820	34800	3181(3002;3371)	3202(3021;3394)		1.46
Restaurants and mobile food service activities	5610	197699	3172(3096;3250)	3469(3379;3562)	2135(2004;2274)	23.11
Tertiary education	8542	205413	3011(2938;3086)	3013(2940;3088)		0.10
<b>Working population</b>		<b>4586294</b>	<b>2933(2918;2948)</b>	<b>2933(2918;2948)</b>		
<b>General population</b>			<b>1574</b>	<b>1574</b>	<b>1574</b>	

### 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 11 January 2022 significantly higher than the working population average are: Passenger air transport and services (sector 51100, 52230), Sports activities (sector 93121, 93130, 93199), Activities of youth work and other associations (sector 94991, 94999), Auditors (sector 69203), Freely subsidized and sports education (sector 85326, 85510, 85422), Art sector (sector 90012, 90032, 90021), Activities of call centres (sector 82200), Retail and wholesale (sector 47750, 47716, 47640, 47711, 47770, 47910, 47721, 46423, 47192, 47114), Architectural activities (sector 71112, 71111), Employment agencies (sector 78300, 78200), Activities of extraterritorial organisations and bodies (sector 99000), Brokerage in real estate (sector 68311), Television and broadcasting (sector 60200), Insurance, legal, financial services, accounting (sector 65121, 69101, 66199, 69201), Organisation of conventions and trade shows (sector 82300), Graphical designers, Public relations and Advertising (sector 74103, 70210, 73110), Other amusement and recreation (sector 93299), Integrated youth work with housing (sector 87901), Nurseries and crèches (sector 88911), Horeca (sector 55100, 56102, 56301, 56101), Wireless telecommunication (sector 61200), Private security (sector 80100), Computer and business consultancy (sector 62020, 70220) and Other social services without housing (sector 88999) (Table 5 and Figure 6).

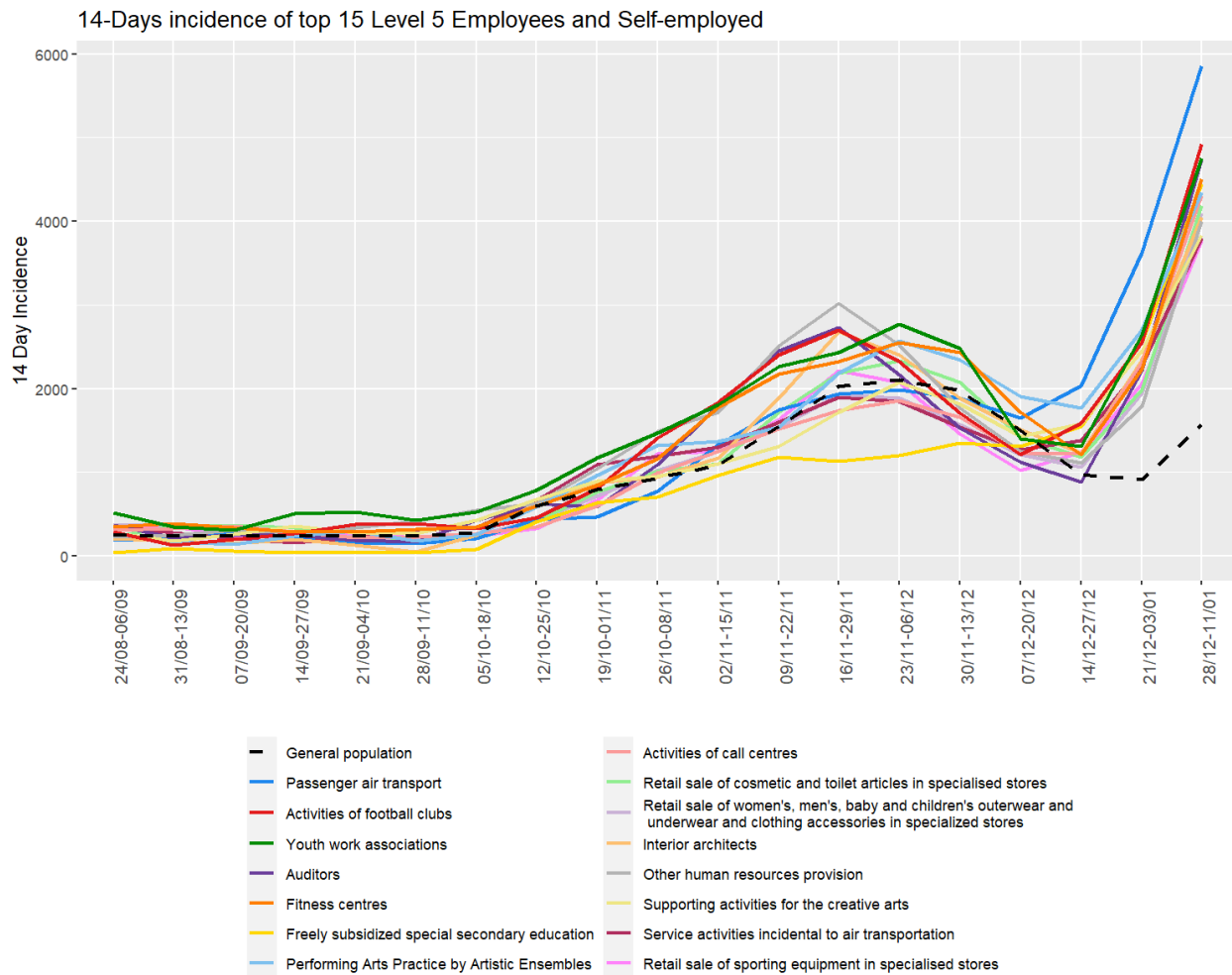


Figure 6: 14-Day incidence of COVID-19 infection in sectors with the highest incidence at Level 5 in both employees and self-employed

Table 5: 14-Day incidence of COVID-19 infection of sectors with the highest incidence at Level 5 on 11 January 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
Passenger air transport	51100	5973	5860(5292;6485)	6114(5512;6777)		7.48
Activities of football clubs	93121	5172	4930(4372;5555)	5773(5054;6588)	3055(2316;4020)	31.74
Youth work associations	94991	5108	4757(4206;5376)	4896(4312;5554)		8.97
Auditors	69203	4108	4747(4137;5441)	5631(4879;6491)		23.16
Fitness centres	93130	5498	4511(3993;5093)	4805(4197;5496)		24.50
Freely subsidized special secondary education	85326	8858	4448(4038;4898)	4448(4038;4898)		0.68
Performing Arts Practice by Artistic Ensembles	90012	6114	4351(3867;4892)	4683(4124;5314)		21.21
Activities of call centres	82200	12822	4305(3967;4670)	4339(3997;4709)		1.70
Retail sale of cosmetic and toilet articles in specialised stores	47750	10165	4191(3818;4598)	4569(4139;5041)	2561(1941;3373)	19.00
Retail sale of women's, men's, baby and children's outerwear and underwear and clothing accessories in specialized stores	47716	36893	4101(3903;4308)	4382(4161;4615)	2541(2161;2986)	15.40
Interior architects	71112	4443	4051(3509;4672)		4014(3442;4676)	88.42
Other human resources provision	78300	4698	4002(3478;4602)	4137(3577;4781)		9.94
Supporting activities for the creative arts	90032	7899	3836(3434;4283)	3880(3443;4370)		16.18
Service activities incidental to air transportation	52230	7158	3800(3381;4269)	3824(3393;4308)		5.40
Retail sale of sporting equipment in specialised stores	47640	9115	3774(3402;4185)	3885(3474;4343)		16.44
Promotion and organization of performing arts events	90021	4618	3746(3235;4334)		2899(2296;3655)	52.49
Activities of extraterritorial organisations and bodies	99000	4041	3737(3194;4368)	3737(3193;4370)		0.67
Retail sale of women's outerwear in specialized stores	47711	6932	3693(3274;4164)	3953(3427;4556)	3178(2538;3973)	33.54
Retail sale of watches and jewellery in specialised stores	47770	4393	3665(3148;4263)		3369(2682;4224)	48.98
Sports and recreation education	85510	9818	3626(3274;4014)		3465(3101;3870)	89.48
Brokerage in the purchase, sale and rental of real estate	68311	19680	3623(3371;3893)	4235(3804;4712)	3239(2938;3570)	62.12
Television programming and broadcasting activities	60200	8114	3611(3226;4040)	3649(3258;4085)		2.40
Non-life direct insurance transactions	65121	5152	3610(3134;4155)	3701(3208;4266)		4.64
Advertising agencies	73110	20686	3558(3314;3819)	4230(3874;4617)	2749(2437;3100)	46.07
Activities of lawyers	69101	24472	3551(3326;3790)	2745(2380;3164)	3855(3582;4148)	73.12
Organisation of conventions and trade shows	82300	8940	3546(3182;3950)	3672(3135;4297)	3441(2965;3991)	55.01
Graphical designers	74103	6007	3529(3091;4027)		3521(3042;4073)	82.95
Public relations and communication activities	70210	16805	3499(3232;3788)	4488(3931;5120)	3117(2822;3442)	72.31
Other recreational and leisure activities	93299	7730	3480(3094;3913)		3037(2615;3525)	71.85
Other associations	94999	12572	3468(3162;3802)	3730(3378;4118)	2392(1858;3075)	19.77
Integrated youth care with housing	87901	12797	3446(3144;3776)	3465(3158;3801)		2.81
Retail sale via mail order houses or via Internet	47910	14286	3444(3157;3756)	3789(3252;4411)	3301(2970;3668)	70.80
Nurseries and crèches	88911	25430	3429(3212;3660)	3423(3199;3662)	3525(2729;4543)	6.41
Retail sale of footwear in specialised stores	47721	7744	3422(3039;3851)	3809(3360;4315)	1873(1305;2682)	20.03
Hotels and similar accommodation	55100	24035	3420(3198;3657)	3598(3356;3856)	1993(1526;2600)	11.29
Other support activities related to financial services	66199	7692	3419(3035;3849)	3732(3287;4235)	2158(1538;3020)	19.95
Other sports activities	93199	4830	3416(2939;3967)		3403(2840;4073)	69.88
Wholesale of clothing	46423	6770	3412(3005;3872)	3733(3250;4284)	2352(1709;3229)	23.29
Wireless telecommunications activities	61200	8773	3374(3016;3773)	3346(2959;3781)		15.89
Accountants and tax consultants	69201	16409	3364(3099;3651)	3745(3414;4106)	2449(2048;2926)	29.64
Retail trade in non-specialized stores where food, beverages and tobacco do not predominate (sales area more than 2500m <sup>2</sup> )	47192	10929	3294(2975;3646)	3351(3025;3711)		2.79
Private security activities	80100	20098	3279(3042;3534)	3298(3056;3558)		3.20
Computer consultancy activities	62020	58991	3270(3129;3417)	3734(3545;3933)	2506(2309;2720)	38.06
Other social services without housing	88999	37067	3259(3083;3445)	3331(3147;3525)	2264(1750;2924)	6.86
Business and other management consultancy activities	70220	95056	3236(3125;3350)	4536(4313;4770)	2584(2463;2711)	66.88
Restaurants with limited service	56102	92731	3233(3121;3349)	3622(3485;3765)	2141(1967;2330)	26.78
Cafés and bars	56301	34138	3231(3049;3424)	4119(3834;4424)	2305(2088;2544)	49.41
Temporary employment agency activities	78200	34800	3181(3002;3371)	3202(3021;3394)		1.46
Building architects	71111	21018	3164(2936;3409)	3250(2716;3885)	3147(2898;3417)	83.57
Retail trade in non-specialized stores where food, beverages and tobacco predominate (sales area between 400 m <sup>2</sup> and less than 2500 m <sup>2</sup> )	47114	106598	3122(3019;3228)	3144(3040;3251)	1782(1256;2523)	1.65
Full-service restaurants	56101	109115	3072(2971;3176)	3346(3227;3469)	2089(1915;2279)	22.55
Freely subsidized higher education	85422	138062	3045(2956;3137)	3047(2958;3139)		0.10
<b>Working population</b>		<b>4586294</b>	<b>2933(2918;2948)</b>	<b>2933(2918;2948)</b>		
<b>General population</b>			<b>1574</b>	<b>1574</b>	<b>1574</b>	

Finally, when considering specifically the non-medical contact professions, we see that the incidence in the employees is higher than the incidence in the self-employed, but the average incidence in the non-medical contact professions is similar to the working population average (Figure 7).

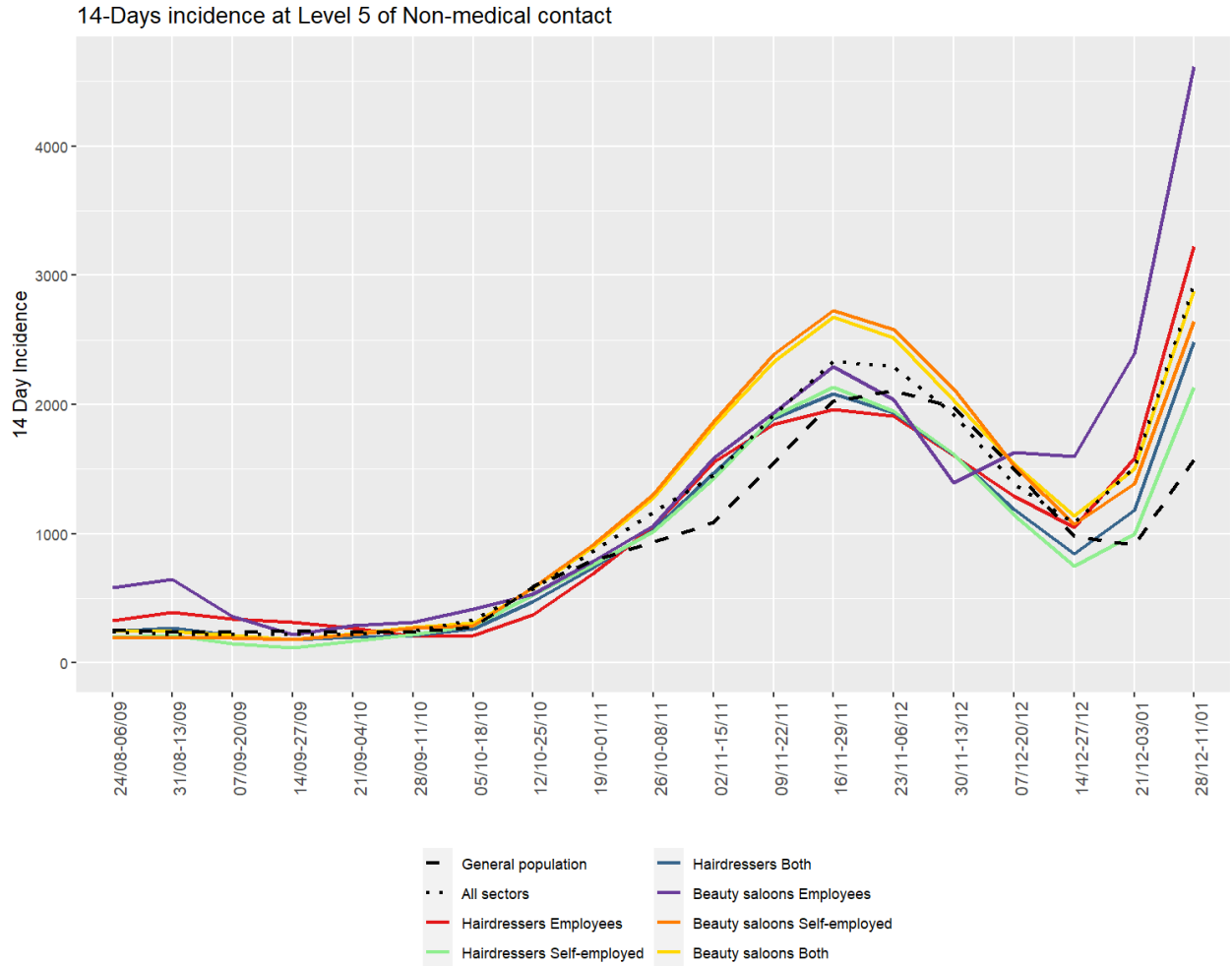


Figure 7: 14-Day incidence of COVID-19 infection at Level 5 of non-medical contact professions.

### 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 Arts, entertainment and recreation (sector R), Information and communication (sector J), Professional, scientific and technical activities (sector M) and Accommodation and food service activities (sector I) are markedly elevated compared to the working and general population (Figure 8). The increased incidence is widespread over these sectors.

Although the 14-day incidence in Real estate activities (sector L), Financial and insurance activities (sector K), Education (sector P), Transportation and storage (sector H), Human health and social work sector (sector Q) and Other service activities (sector S) is around the working population average, individual subsectors show an increased incidence. Passenger air transport (sector 5110, 5223), Real estate agencies (sector 6831), Credit granting and auxiliary financial services (sector 6492, 6619) Other education (sector 855), Other residential care (sector 8790), Child day-care (sector 8891), Other care without residency (sector 88999) and Activities of other membership associations (sector 9499) all show 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, while several retail trade sectors show an increase incidence compared to the working population average (Figure 8).

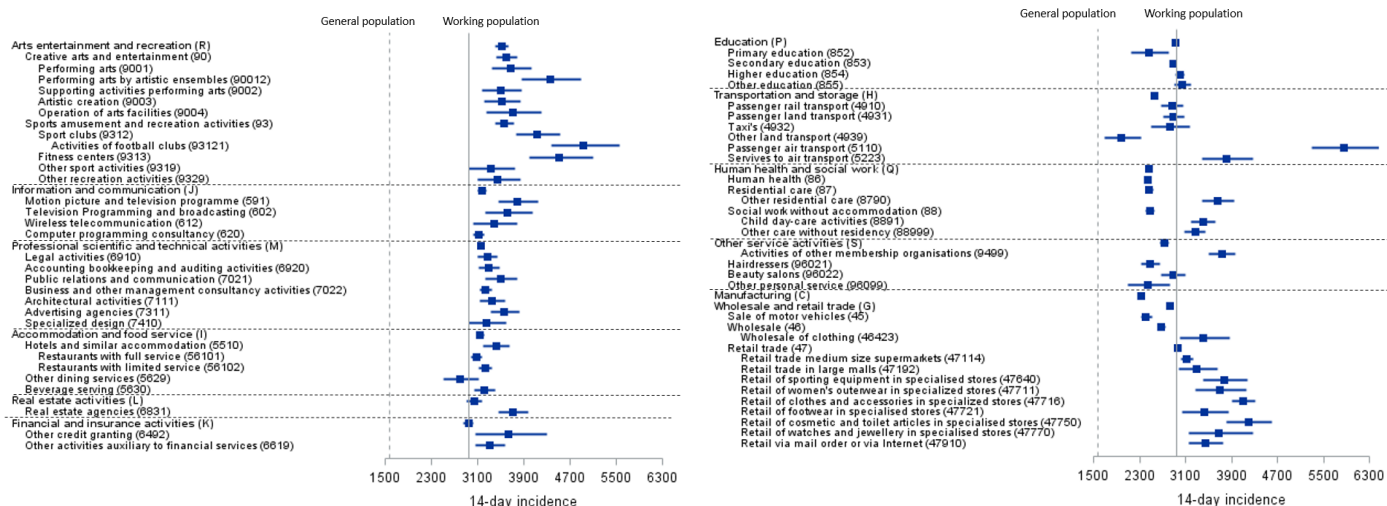


Figure 8: Forest plot of 14-Day incidence and 95% CI of selected sectors on 27 December 2021 in both employees and self-employed.

### 3.7 Contact tracing

In 2020–2021 about 800,000 employees are under medical surveillance of IDEWE. Among these, 41,107 COVID-19 index cases were registered between 22 July 2020 (week 30) and 6 January 2022, for whom the customer segment, region and the registration date are known for 40,680 index cases.

The incidence is declining since 1 December to 146 per 100,000 in 14 days on January 6st, but since the last week of 2021, the weekly absolute number of index cases is rising again (Figure 9). Incidence was highest in Emergency services, Public transport, Accommodation & food trade and Logistics & retail (between 285 and 246 per 100.000 in 14 days). Incidence was very low in the Education segment due the extended Christmas holidays, during which index cases are not reported to our service for contact tracing. The low incidence in Education lowers the overall incidence (Figure 9).

Analysis by region shows that currently Namur and Leuven are the regions with the highest incidence, 223 and 204 per 100.000 in 14 days, respectively. In these regions, as well as in Brussels, incidence is rising again (Figure 9). 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.

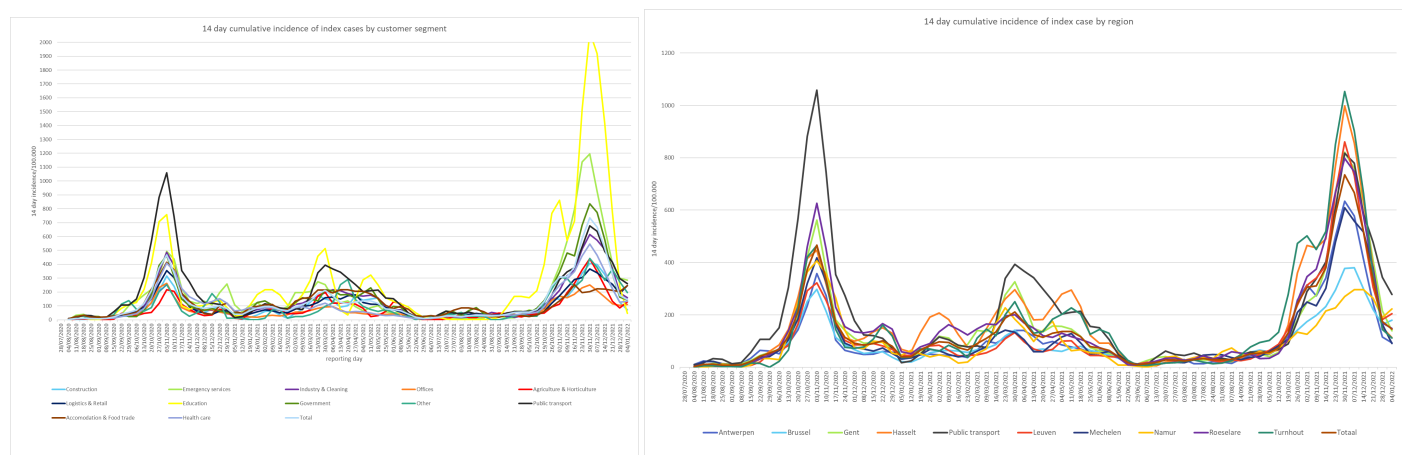


Figure 9: 14-Day incidence of index cases by segments under surveillance (left) and by region (right)

Since the establishment of the tracing app on 29 October 2020, there are 34,205 index cases of whom high-risk contacts were recorded. Of 33,941 index cases, the customer segment and region is known. The mean number of high-risk contacts in segment Education, Emergency services and Public Transport is above 1, while in the Hasselt region a higher mean number of high-risk contacts is reported in the period 29 October 2020–6 January 2022 (Figures 10).

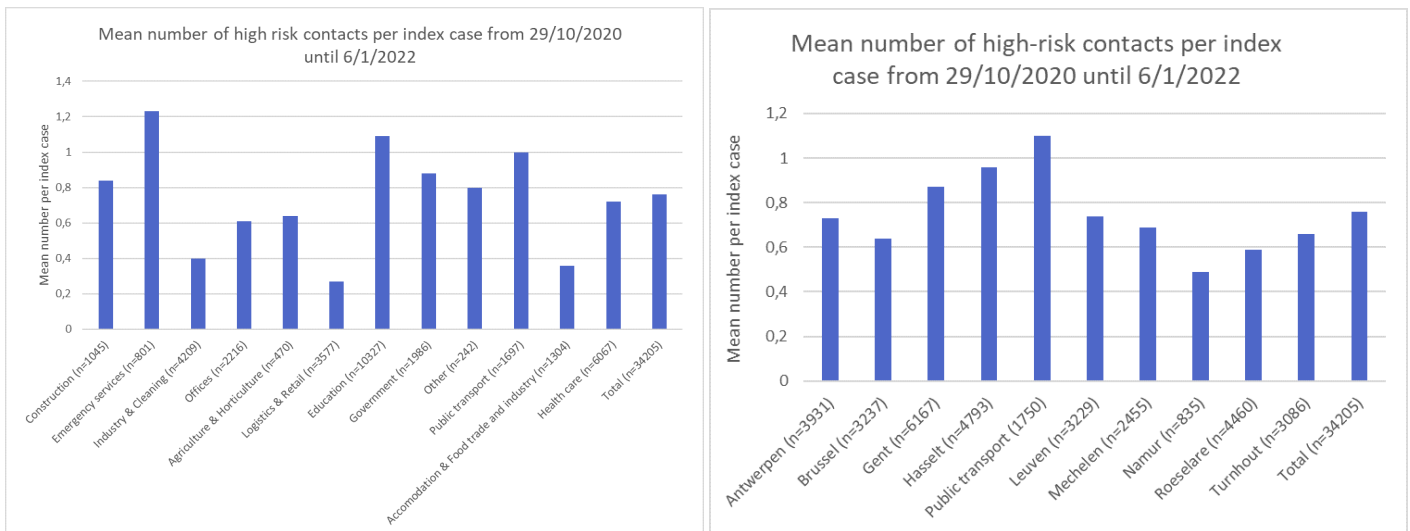


Figure 10: The mean number of high-risk contacts per index case by segments under surveillance (left) and by region (right)

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. Seventy 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 increased since September to the highest level measured, 33%, by the end of October. This percentage decreased during the last two to three months to the lowest level ever. Only 6.3% of index cases had two or more high risk contacts at the turn of the year, reflecting the changed behavior on the work floor after the stricter mitigation measures (Figure 11).

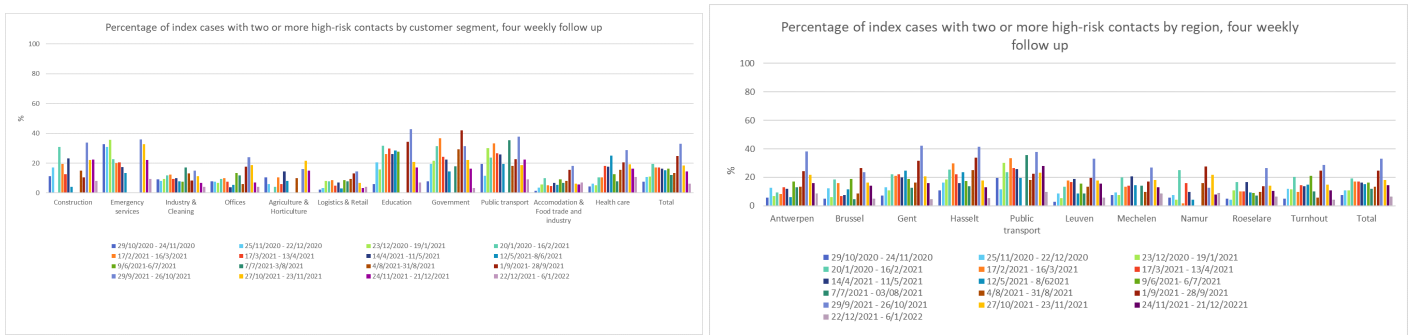


Figure 11: Four weekly percentage of index cases with two or more high-risk contacts by segments under surveillance (left) and by region (right)

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 22,554 index cases, we have information about perceived work relatedness of the source of infection. While 40% of the index cases does not know whether the infection took place at work, 16% responded that they were certainly or probably infected at work (Figure 12 left). From 5,752 (26%) 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.



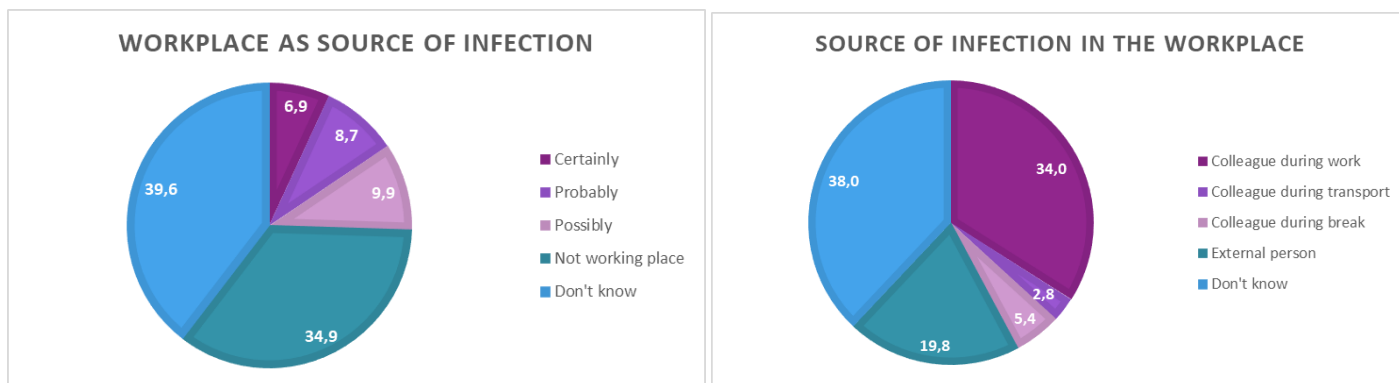


Figure 12: Distribution of the probability and source of infection at work by index case

The proportion of index cases in the Education segment that are attributed to pupils was around 40% during the schoolyear, and is now about 11%. (Figure 13 left). This means that most of index cases in the education segment is among teachers. 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 (87%) in school year 2021 is aged under 12 years (and unvaccinated) and 22% were under 6. The proportion of pupils under 6 was growing before the extended school closure (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, 9 June–6 July 2021 and 22 December 2021–4 January 2022.

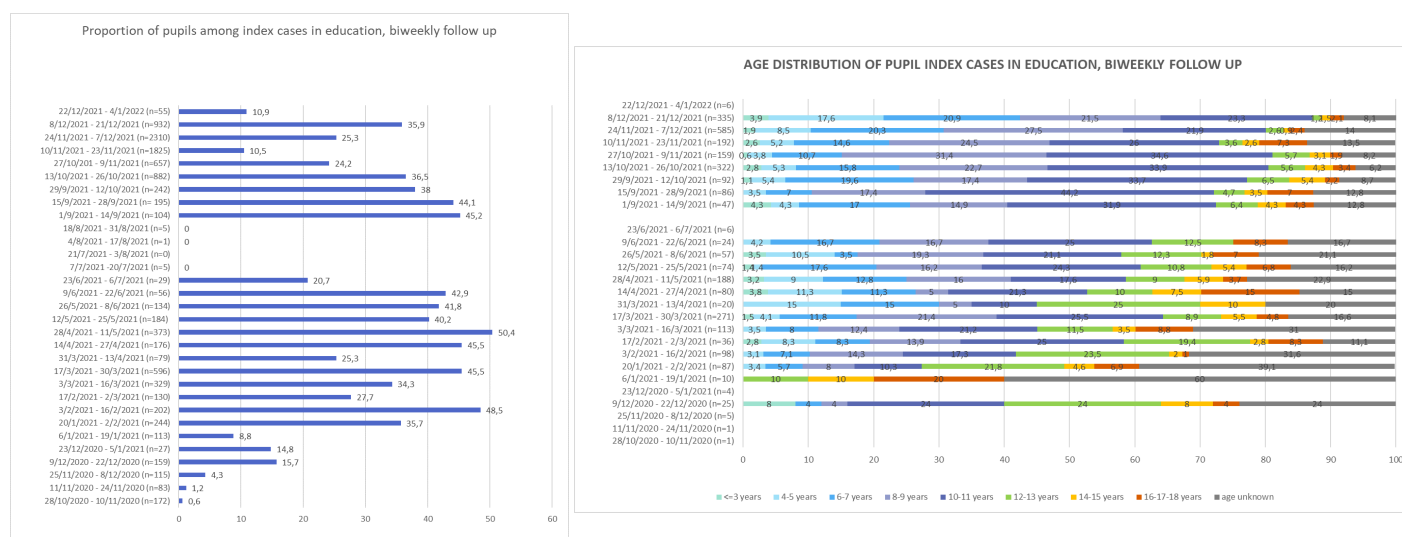


Figure 13: The evolution of index cases of pupils in school (left) and their age distribution (right).

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 16,887 adult index cases we had information about their vaccination status: 14,649 were partially or completely vaccinated (9,757 Cominarty, 2,206 Vaxzevria, 816 Moderna and 848 Johnson % Johnson and 1022 did not know the type of vaccine) (Figure 14 left). With a vaccination coverage in the working population of 86% 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 right).

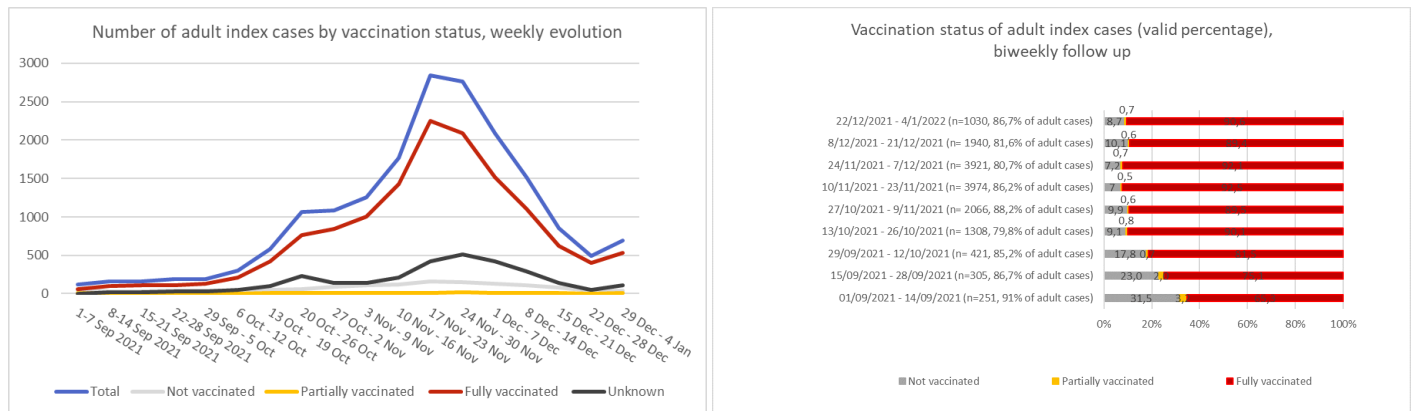


Figure 14: The weekly evolution of index cases and their vaccination status (left) and biweekly evolution of the self-reported vaccination status of index cases (right).

## 4 Conclusion

Despite the limitations of the data, the RSZ/ONSS data demonstrates a sharp increase of the 14-day COVID-19 incidences in all sectors, reflecting the effect of the more contagious omicron variant-of-concern despite mitigation measures and the booster vaccination. The highest incidence is present in the air transport sector. The average incidence in the working population is almost twice the average incidence in the general population, suggesting that infections are passed mostly among adults. Vigilance of absenteeism is required in all sectors to safeguard the continuity of activity.

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, 7% indicated that the workplace was certainly the source of infection.

With an increased circulation of the omicron variant-of-concern of SARS-CoV-2, it is important to carefully monitor the incidence of COVID-19 in all sectors, especially sectors with multiple close physical proximity, and with close proximity with others Air transport, Arts, entertainment and recreation, Movie and television programming and broadcasting, Nurseries and crèches, Horeca, Activities of other membership organisations and Other Residential and non-residential care show increased incidences and require careful attention.

For some sectors the reason for the higher incidences is not immediately obvious, such as Legal activities, Accounting, Public relations, Business consultancy, Architectural activities, Advertising, Specialized design and Financial Services. 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 and wholesale sectors are well protected, as they are often not able to telework. An increase is seen however among employees of several retail sectors.

Finally, despite the high degree of vaccination, COVID-19 infection remains possible. Continuous monitoring of breakthrough infections and especially protection against hospitalization is warranted. It is good to note that the last months, the percentage of index cases with two or more high-risk contacts is decreasing to the lowest levels measured, especially under an upcoming more contagious omicron variant-of-concern.

## Acknowledgments

We wish to thank Hilde Vanacker, Chris Verbeek and Hilde de Raeve for their contribution to the analysis of the contact tracing data.