Long-Covid: Should it be in the occupational fast lane?

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Outline

- Setting the scene – peaks and troughs and lockdowns
- Who worked, where and in what occupations?
- Transmission in the workplace and resulting infection rates
- Symptoms and outcomes of infection
- Which occupations are at risk and what do we know?
- Acute complications and longer-term effects
- Is Covid an occupational disease and what shall we do about it?
- Filling the knowledge gaps

SARS-CoV-2 and COVID-19

The Virus Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2)

- First identified end December 2019 in China as cause of outbreak of ‘atypical viral pneumonia’,

The Disease Coronavirus disease 2019 (COVID-19).

- First case of COVID-19 documented in the UK was on 31st January 2020

Long Covid -signs and symptoms persisting after 4 weeks

Acute COVID-19

defined as signs and symptoms of infection for up to the first 4 weeks.

Ongoing symptomatic COVID-19

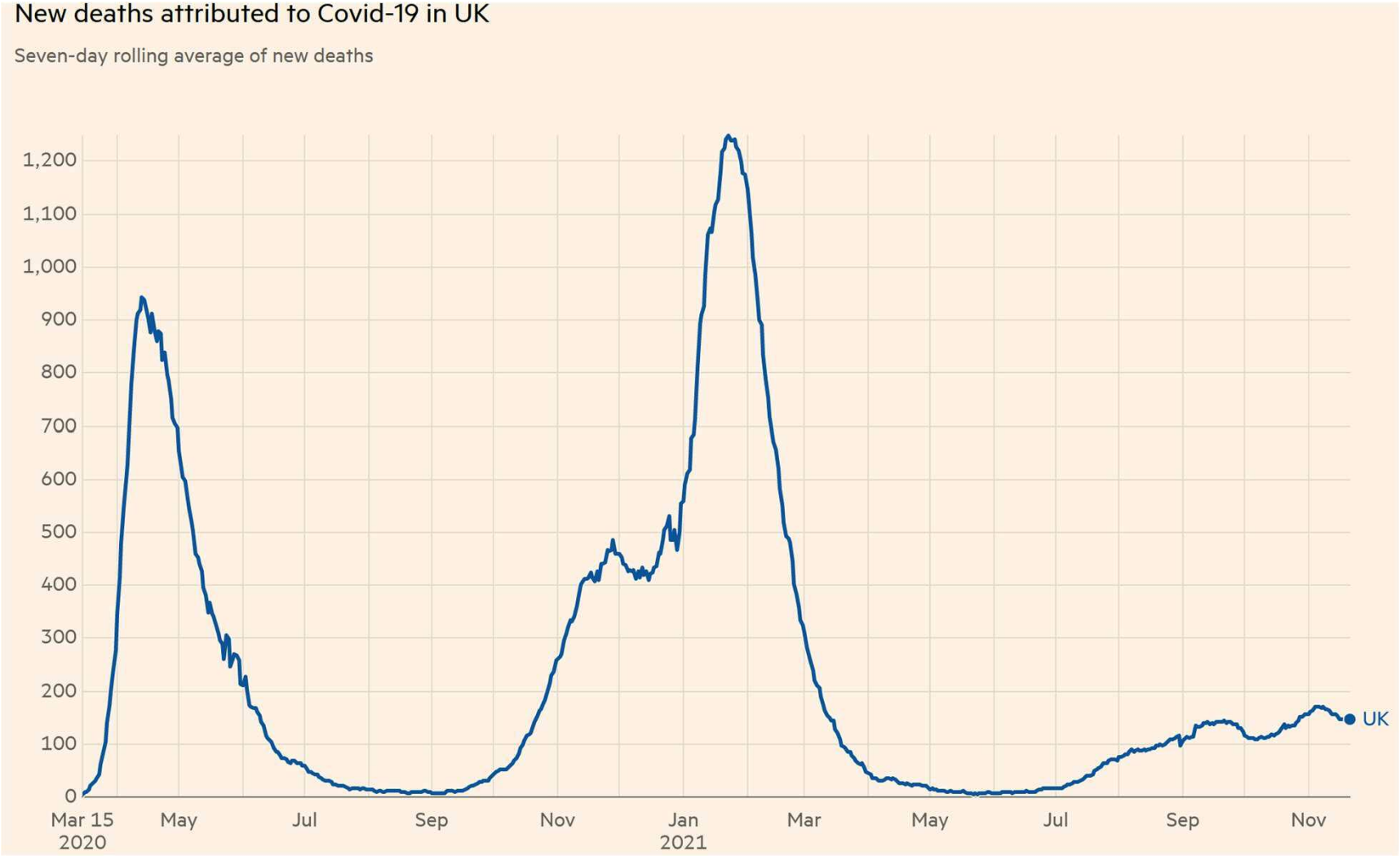
defined as signs and symptoms of infection from 4–12 weeks.

Post-COVID-19 syndrome

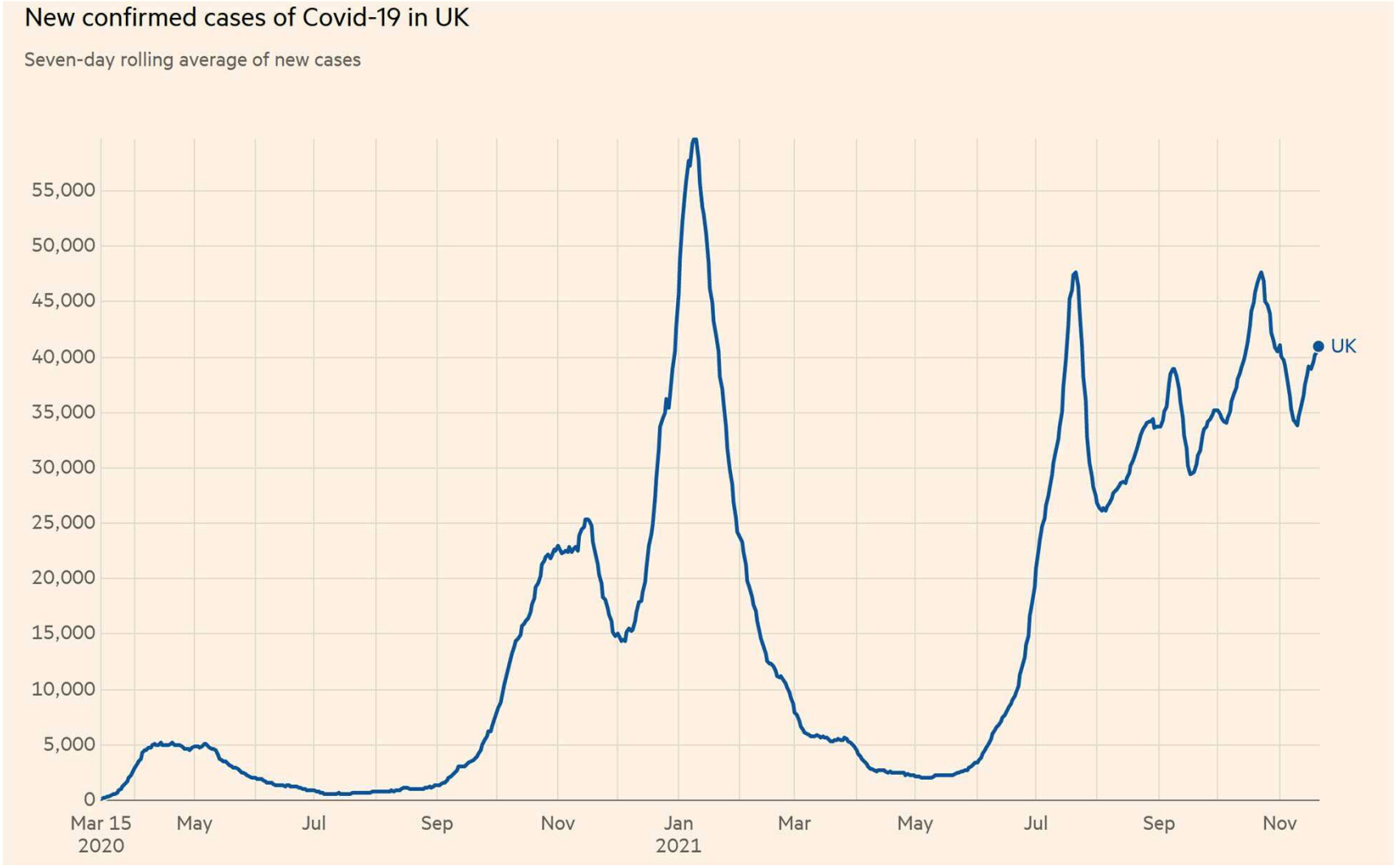
defined as signs and symptoms of infection consistent with COVID-19 lasting longer than 12 weeks

WHO definition October 2021

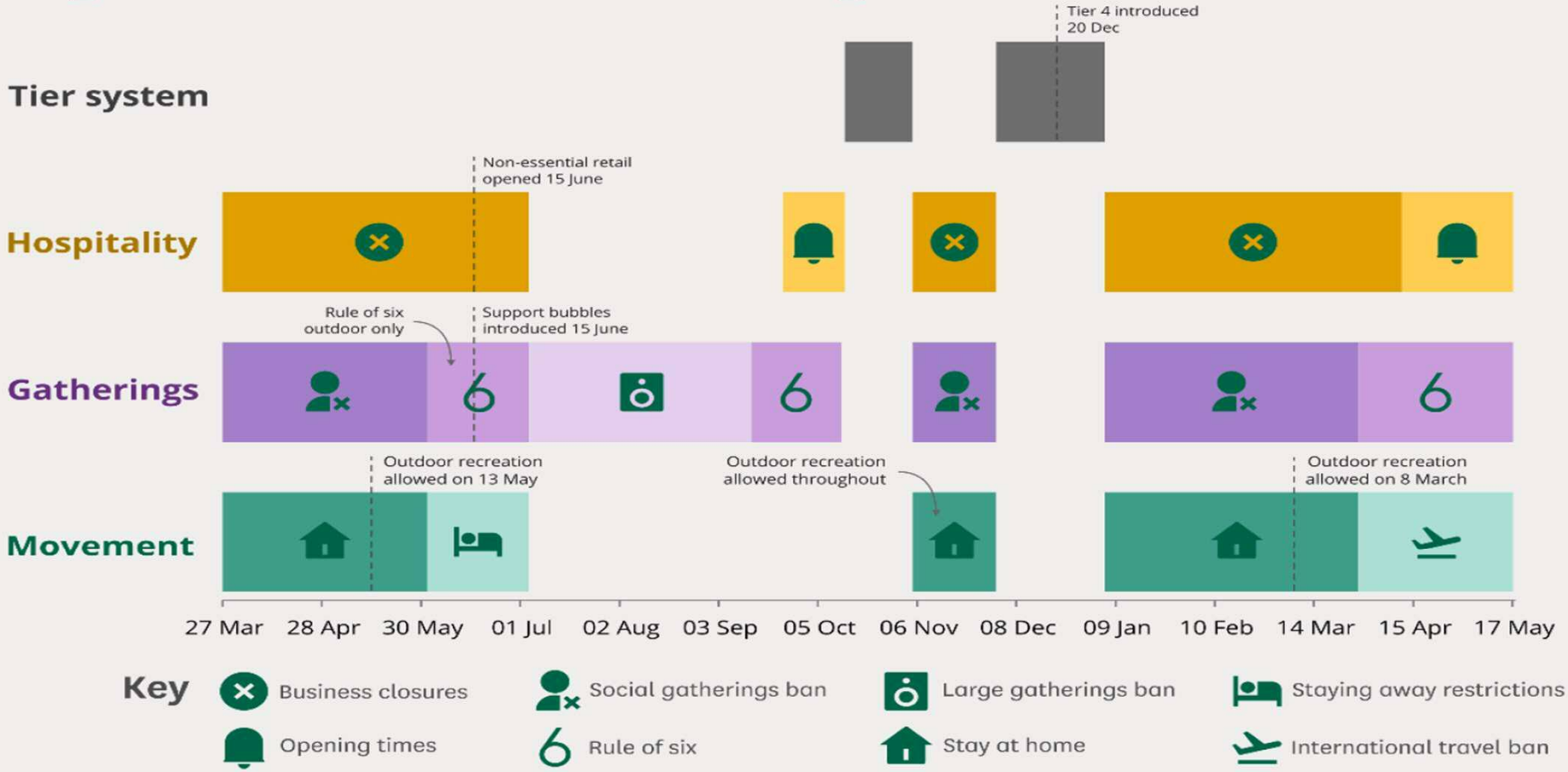
- Post COVID-19 condition occurs in individuals with **a history of probable or confirmed SARS-CoV-2** infection
- **Usually 3 months from the onset of COVID-19 with symptoms that last for at least 2 months and cannot be explained by an alternative diagnosis.**
- Symptoms generally have an **impact on everyday functioning.**
- May be **new onset,** following initial recovery from an acute COVID-19 episode, or **persist** from the initial illness. May fluctuate and relapse



FT mortality tracker

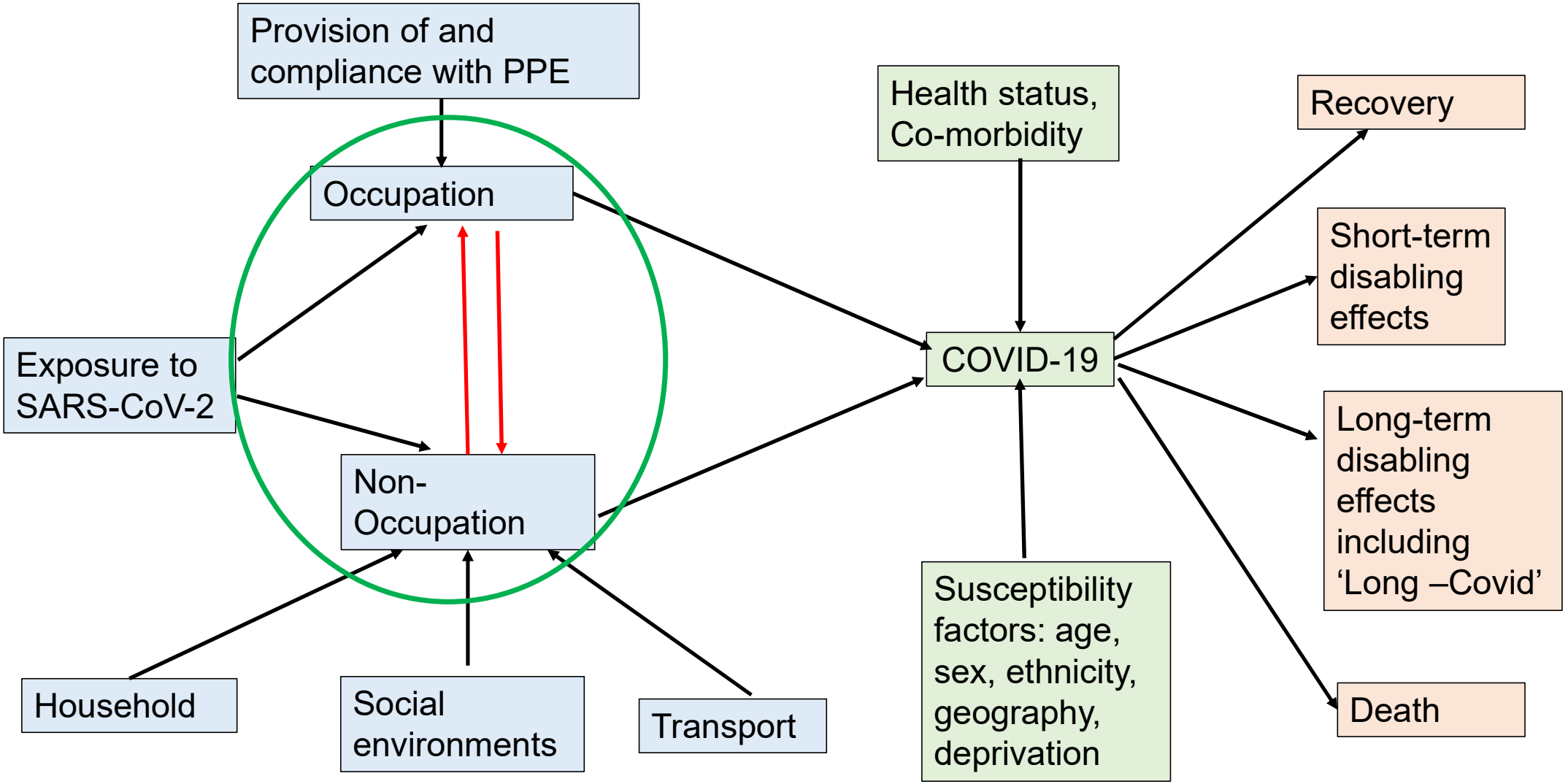

New confirmed cases of Covid-19 in UK
Seven-day rolling average of new cases
55,000
50,000
45,000
40,000
35,000
30,000
25,000
20,000
15,000
10,000
5,000
0
Mar 15
2020
May
Jul
Sep
Nov
Jan
2021
Mar
May
Jul
Sep
Nov
UK

England's lockdown laws through time



Note: Nightclubs and some other entertainment venues have been closed throught the timeline.

@commonslibrary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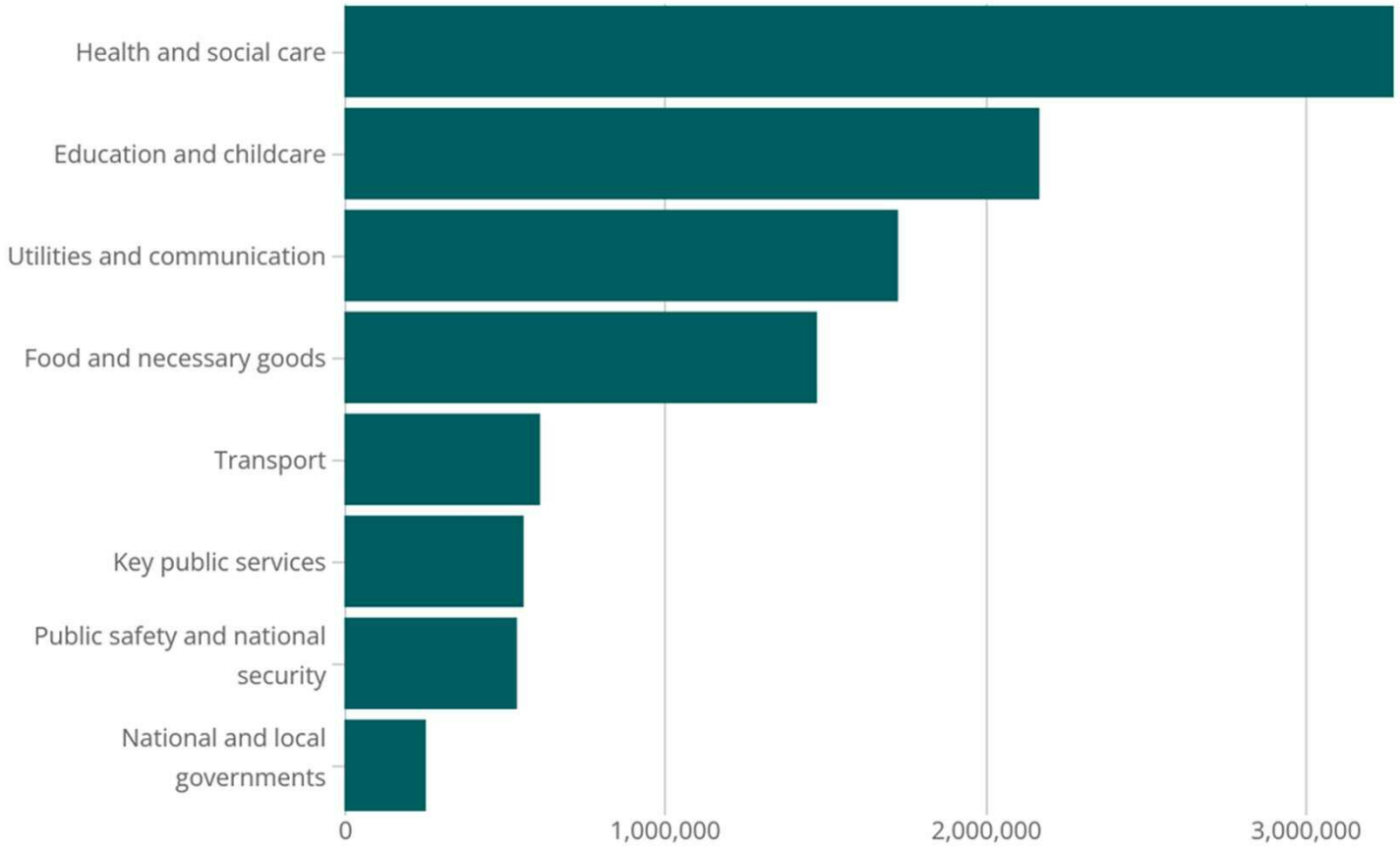
Long-term disabling effects including 'Long –Covid'
Death

Characteristics of key workers from the LFS 2019 (ONS)

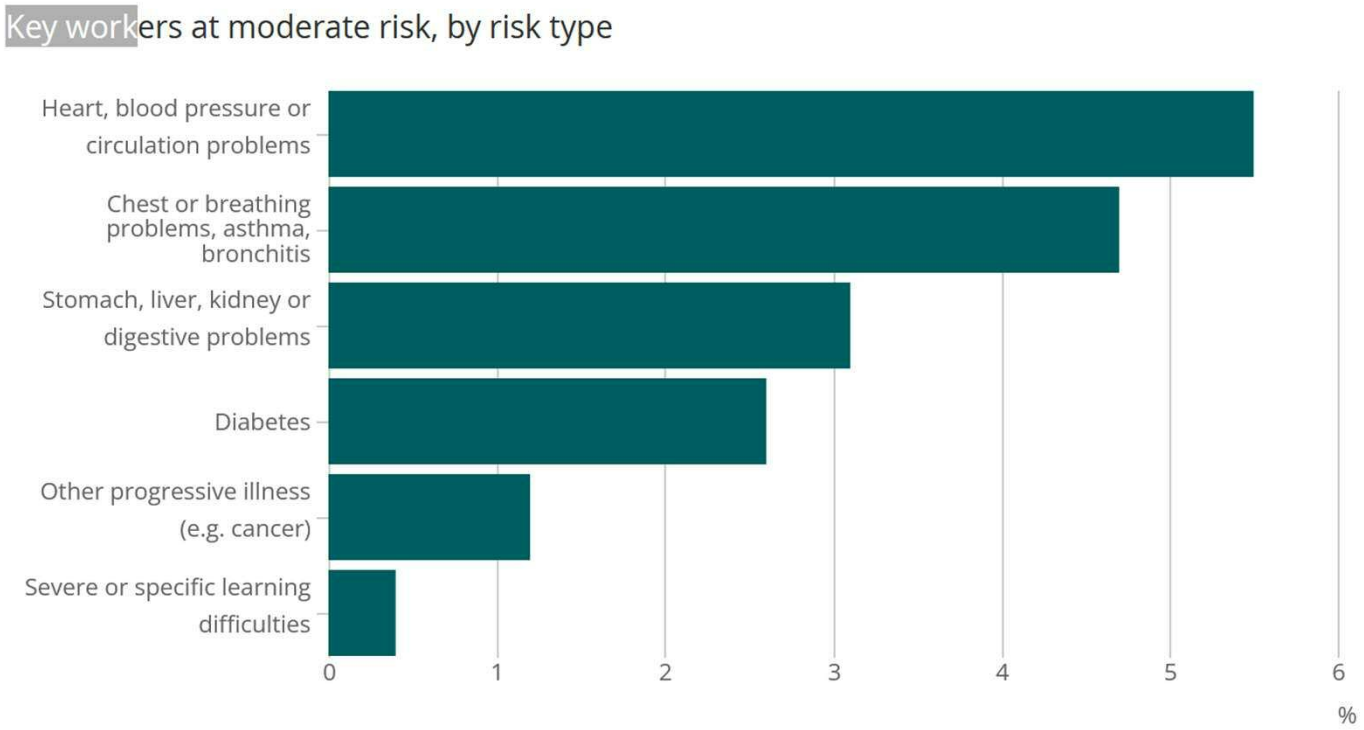
- 10.6 million of those employed (33% of the total workforce) were in key worker occupations and industries.
- Largest group worked in health and social care (31%).
- 15% of key workers at moderate risk from COVID-19 because of a health condition.
- 31% of key workers had children aged 5 -15 years; 16% had children aged ≤4 years.
- Of all households with children < 16 years, 6% were key workers and lone parents; 9% were households where both members of the couple were key workers.
- 14% of key workers reported working from home at least one day in the past week in 2019.
- 16% of key workers travelled to work by public transport. National/local government (30%), key public services (30%), utilities and communications (28%).

Numbers of key workers by occupational groups



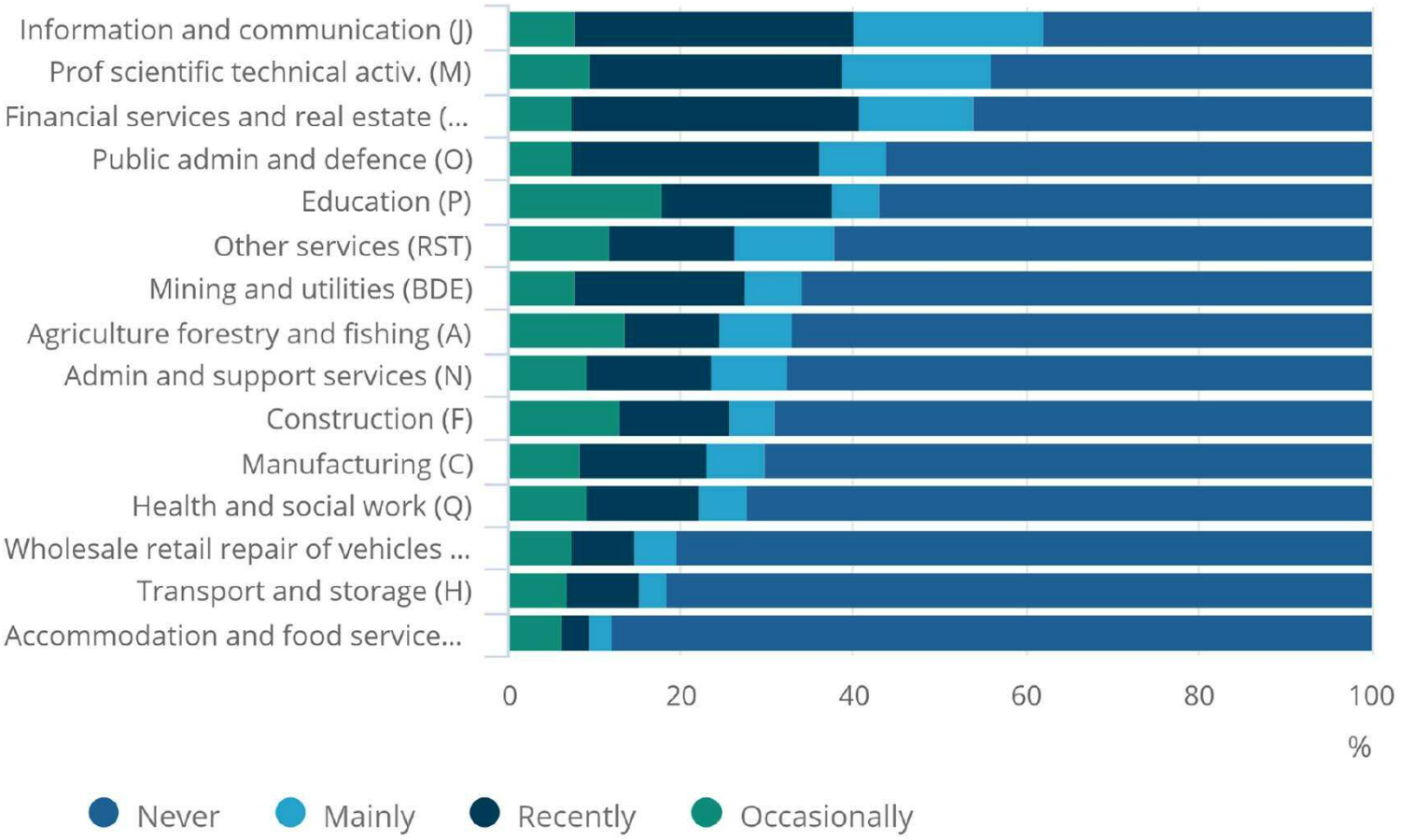
ONS Coronavirus and key workers in the UK

Health Risks of Key Workers

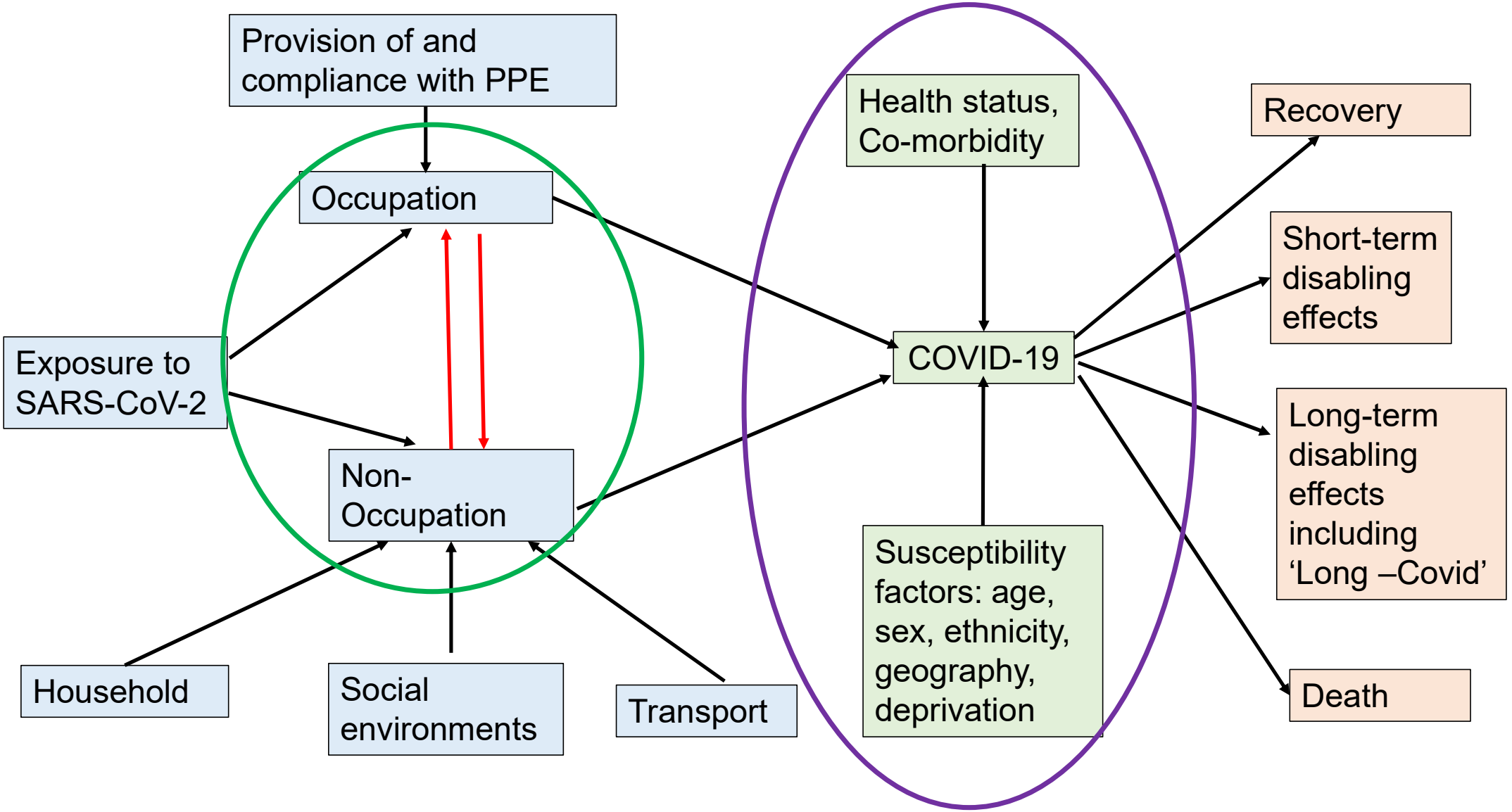


Source: Office for National Statistics - Annual Population Survey

Industry Sector by Work From Home Status, UK 2020



ONS Homeworking hours, rewards and opportunities in the UK: 2011 to 2020. 2021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Transmission in the workplace

Transmission can occur through:

- Direct physical contact between individuals
- Contact with contaminated objects
- Droplet spray transmission (coughs/sneezes)
- Inhalation of fine aerosols as an infected person exhales

Distance is important – Droplets fall rapidly, Aerosols can spread over a long distance

Dependent on individual behaviour – compliance with social distancing, use of face coverings

Workplace infection risks increase with:

- Proximity
- Number of contacts with other workers or general public/patients
- High density of workers in confined spaces
- Lack of controls – Poor ventilation, lack of respiratory protection etc

RIDDOR: Worker COVID-19 disease reports made by employers to HSE and Local Authorities (April 2020 – August 2021)

Industry sector (as reported by employer)[1]	Total COVID-19 notifications	Fatal notification	Non-fatal notification
All industry	**34,835**	**409**	**34,426**
All Manufacturing	**1,686**	**16**	**1,670**
Manufacture of food products	507	3	504
Other manufacturing	452	7	445
Construction	**304**	**4**	**300**
Wholesale and retail trade; repair of motor vehicles and motorcycles	**717**	**2**	**715**
Transportation and storage	**642**	**10**	**632**
Accommodation and food service activities	**1,660**	**14**	**1,646**
Information/communication; financial/insurance; real estate activities; professional, scientific and technical activities; admin/support service	**761**	**10**	**751**
Public administration and defence; compulsory social security	**1,594**	**7**	**1,587**
Education	**2,570**	**10**	**2,560**
Human health and social work activities	**20,812**	**286**	**20,526**
Arts, entertainment and recreation; other service activities	**3,628**	**49**	**3,579**

Outbreaks of infection in workplaces PHE May – October 2020

Workplace Setting Type (from HPZone)	Number of Outbreaks	Number of Workplaces (England)	*Outbreak Rate* (per 100,000)	FOI Request
Manufacturers and packers of food	117	6,998	1,672	408
Warehouses	58	15,058	385	108
Manufacturers and packers of non-food	195	63,312	308	728
Retailers	219	195,025	112	559
First responders/Military sites	57	67,257	85	218
Distributors and transporters	84	125,414	67	408
Restaurants and caterers	53	117,836	45	
Offices	193	721,351	27	687
Close contact services	13	52,866	25	
No setting type assigned	54	511,071	11	
Primary producers	8	93,086	9	
Other	266	-	-	4523
Total	1,317	1,969,274	67	

Chen et al 2021: medRxiv preprint doi:
https://doi.org/10.1101/2021.05.06.21256757

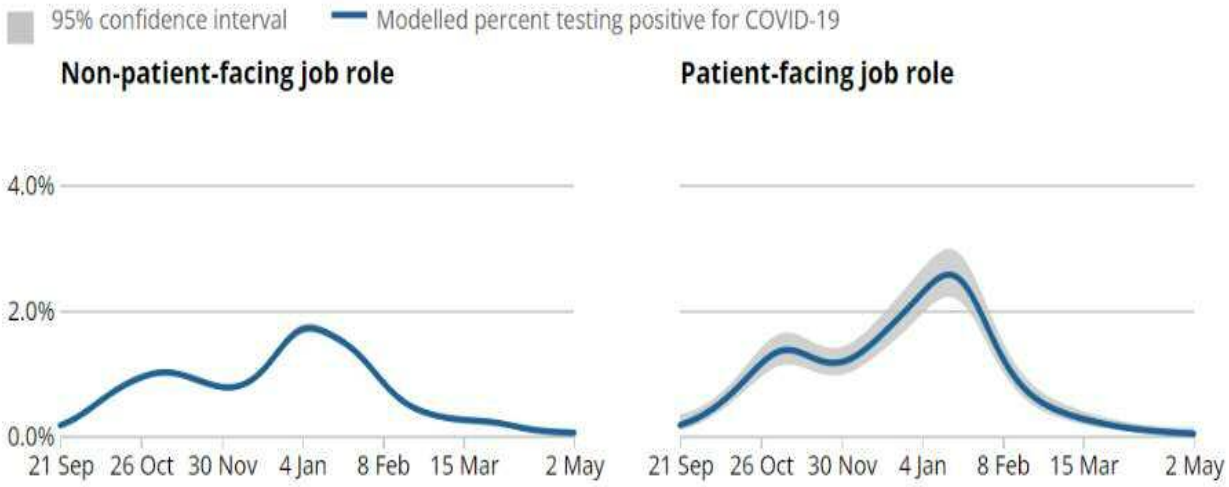
Infection data

- Numerous studies on the risks of infection: many in healthcare, fewer in the community
- Access to testing in the UK and other countries limited early on with sectors such as healthcare being prioritised - many studies therefore opportunistic
- Interpretation often limited by biases:
  - test availability
  - small sample sizes or unclear participation rates
  - lack of comparator populations
  - imprecise exposure estimates
  - no control for confounders

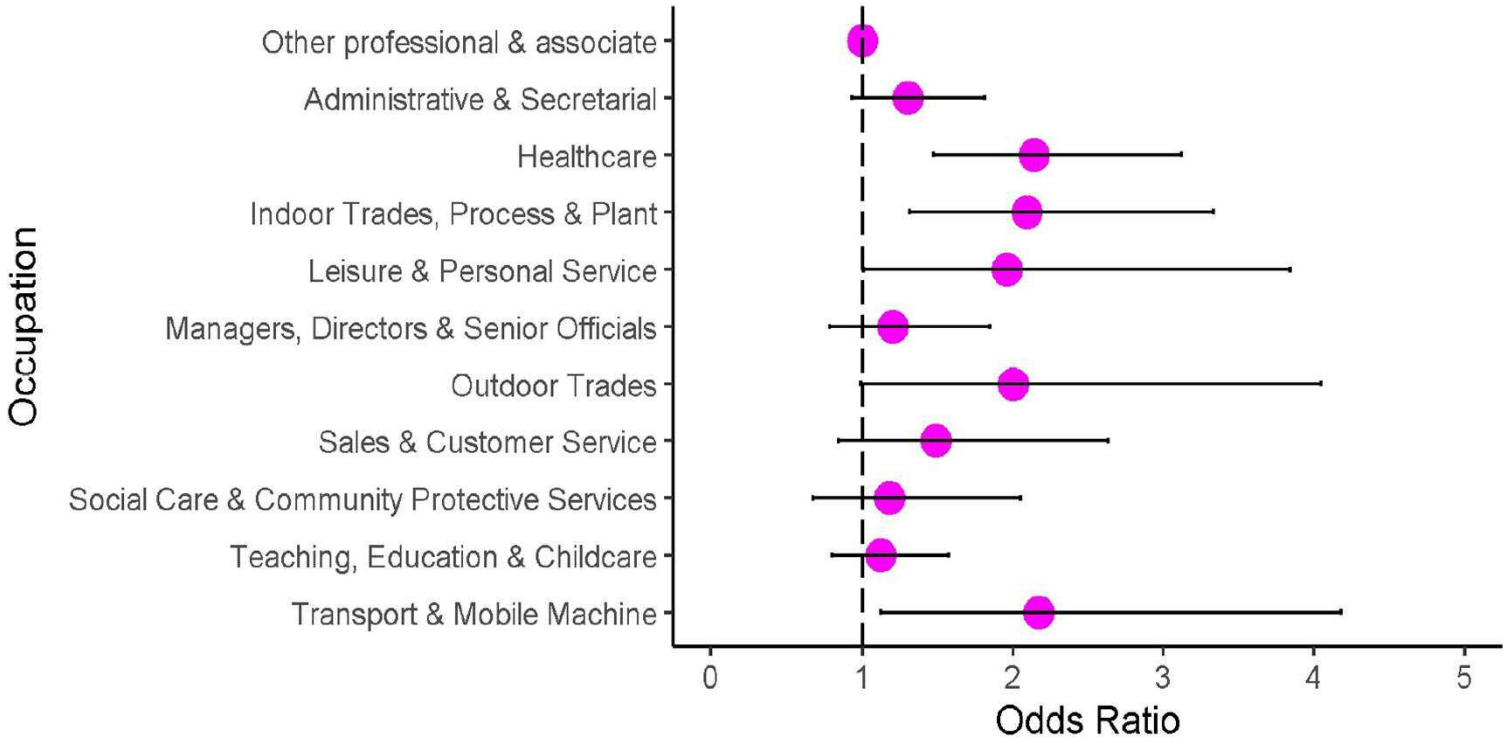
- Informative population studies: ONS, REACT, Virus-Watch, PHE, Biobank
- Series of studies show how risks vary over the pandemic

ONS Infection studies

Estimated percentage of the population testing positive for COVID-19 on nose and throat swabs by patient-facing role, UK, from 21 September 2020 to 2 May 2021



Odds of SARS-CoV-2 Seropositivity by Occupation*

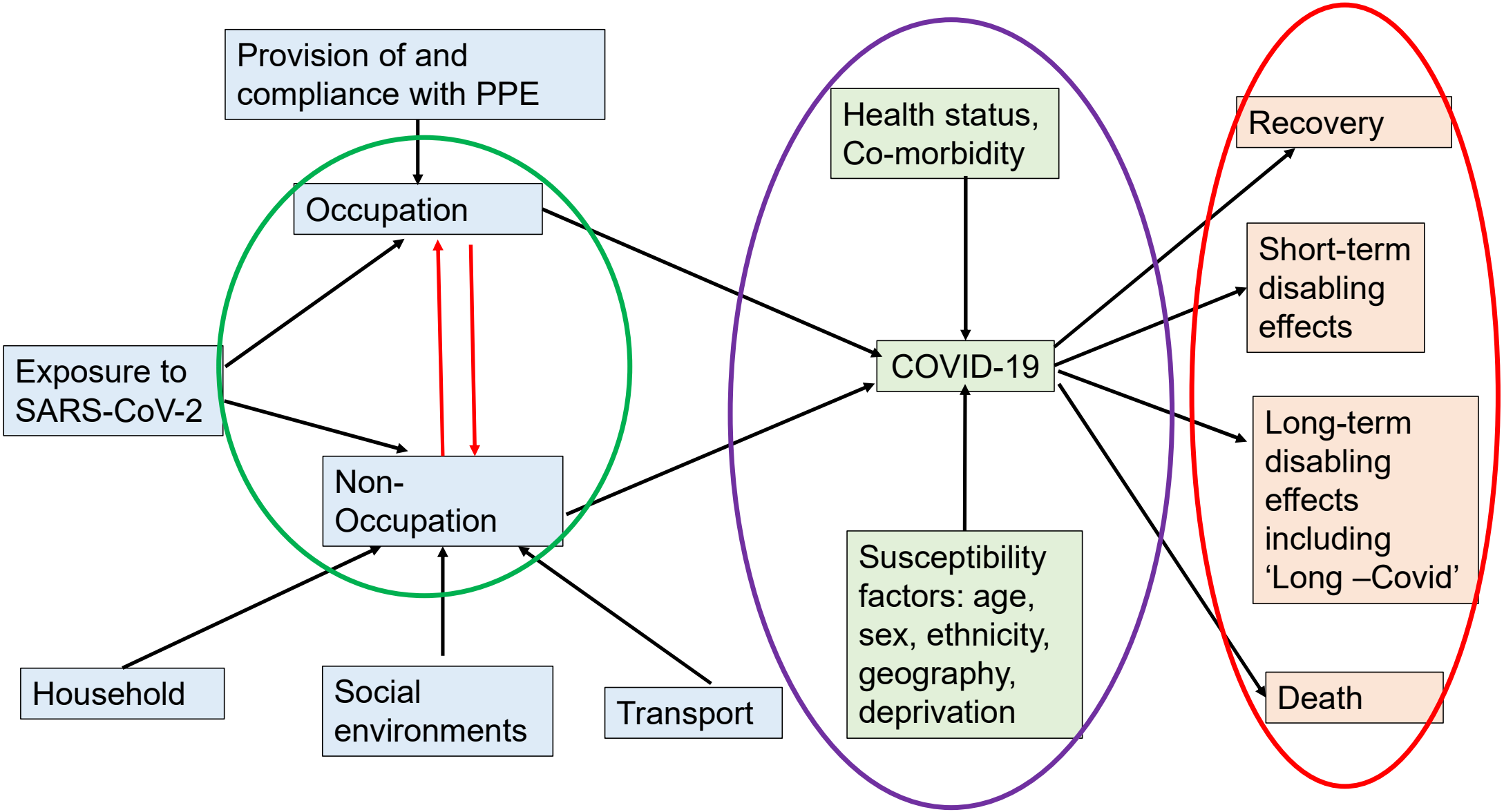


*Total Effect Adjusted for Age, Sex, Region, and Household Income

Beale et al. medRxiv preprint doi: https://doi.org/10.1101/2021.05.13.21257161

REACT: infection rates

Work Type	Infection increasing; local Tiers	Rapid growth in infection	Drop in mobility	Mobility increased	Lockdown still but infections decreasing	
	18/09-5/10	16/10-2/11	13/11-3/12	6/01-15/01	4/01-23/02	11/03-30/03
Delivering to homes	0.91 (0.45,1.83)	0.86 (0.52,1.41)	1.13 (0.68,1.89)	1.15 (0.80,1.65)	0.72 (0.32,1.61)	1.84 (0.75,4.50)
Food and other retail	1.18 (0.88, 1.59)	1.28 (1.03, 1.57)	1.20 (0.92, 1.56)	1.30 (1.08, 1.56)	1.13 (0.77, 1.65)	1.08 (0.57, 2.05)
Hospitality	1.33 (0.91, 1.91)	1.20 (0.90, 1.60)	1.64 (1.19, 2.24)	1.20 (0.92, 1.56)	0.92 (0.47, 1.78)	0.24 (0.03, 1.71)
Personal care	0.63 (0.26, 1.51)	1.56 (1.01, 2.38)	1.06 (0.58, 1.94)	0.81 (0.50, 1.30)	0.47 (0.12, 1.87)	0.57 (0.08, 4.09)
Police, prison, fire etc	0.85 (0.38, 1.91)	0.98 (0.60, 1.62)	2.02 (1.29, 3.16)	1.68 (1.17, 2.41)	1.49 (0.77, 2.90)	1.66 (0.51, 5.22)
Public transport	1.40 (0.75, 2.63)	0.75 (0.40, 1.40)	1.39 (0.78, 2.46)	2.17 (1.68, 2.97)	2.14(1.20, 3.83)	1.54 (0.49, 4.86)
Education, school, nursery, childcare	1.15 (0.90, 1.48)	1.22 (1.04, 1.44)	1.14 (0.94, 1.40)	1.20 (1.03, 1.39)	1.43 (1.07, 1.91)	1.10 (0.66, 1.83)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Symptoms and Outcomes

- Approximately one-third do not develop symptoms.
- 'Mild' illness:
  - cough, fever, muscle aches, headache, shortness of breath, sore throat, diarrhoea, nausea and vomiting, loss of sense of taste and smell, abdominal pain, nasal symptoms, skin rashes
  - Most patients recover within a few weeks
- Acute complications occurring within 2-4 weeks:
  - Multi-system inflammatory condition causing acute respiratory failure, acute cardiac injury, myocarditis, cardiomyopathy, arrhythmias, renal failure, pulmonary embolus and stroke.
- Long-term complications:
  - Prolonged debilitating illness
  - severe fatigue, breathlessness, chest pain or heaviness, fever, palpitations, cognitive impairment ('brain fog'), skin rash, cardiac abnormalities, sleep disturbances, symptoms of post traumatic stress disorder (PTSD), muscle pain, concentration problems, headache.

Susceptibility Risk Factors

Demographic

- Male sex and older age groups:
  - Usually men have a 50% higher annual mortality than women of the same age
  - For COVID-19 men have about a 70% additional risk over the age of 40

Co-morbidities

- Obesity, hypertension, diabetes mellitus, cardiovascular disease, kidney disease, cerebrovascular disease, COPD,
- Immunosuppression

Co-exposures

- Smoking/environmental tobacco smoke
- Residence or work in high particulate air pollutant environments
- Limited access to healthy foods and physical activity

Factors that may confer or compound both vulnerability and susceptibility

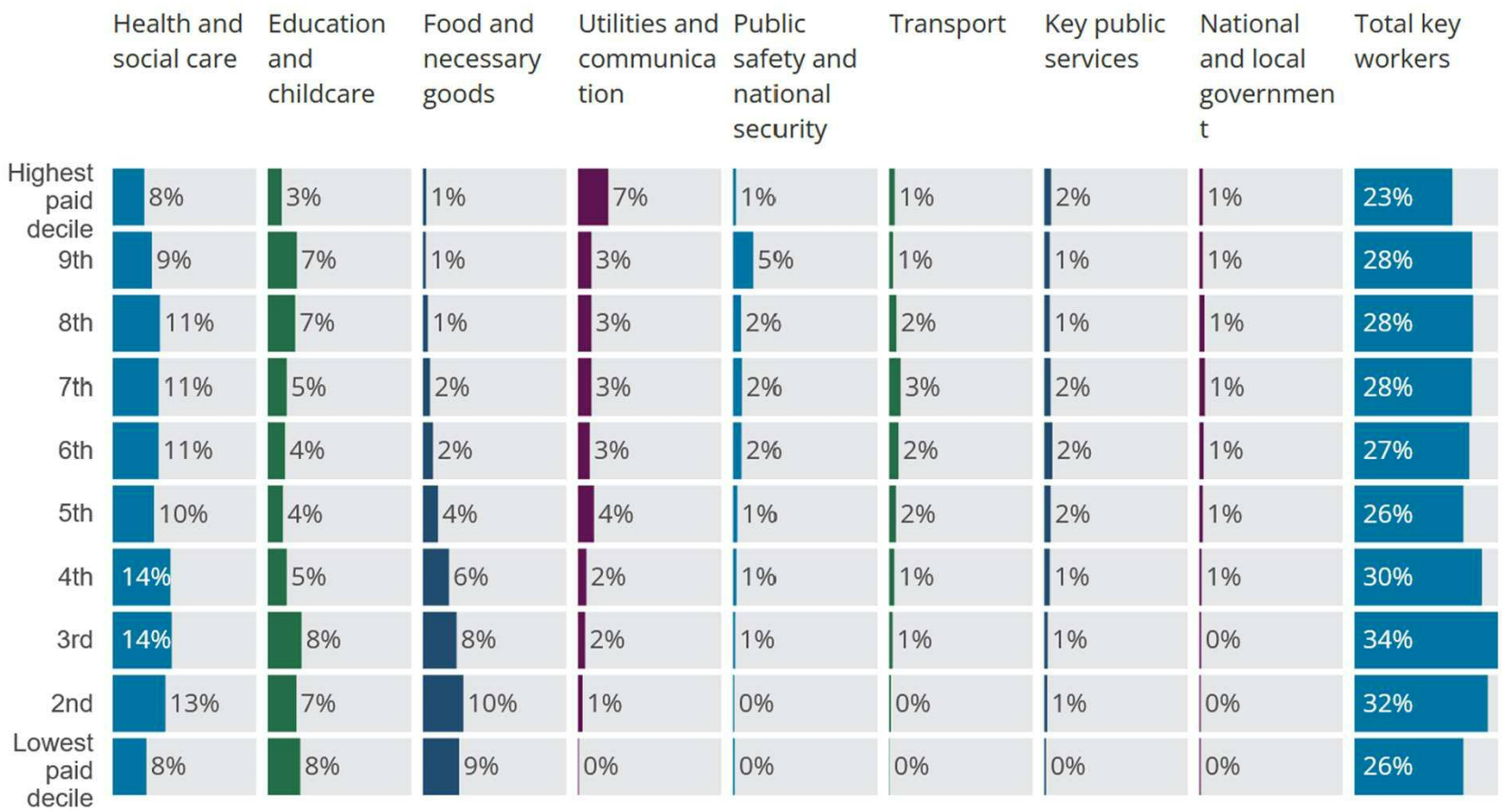
Enhance Exposure to SARS-CoV-2

- Residence in densely populated neighbourhoods
- Residence in homes that are overcrowded, multigenerational, shared kitchens and bathrooms
- Dependence on mass or shared (crowded) transportation

Predispose to poorer health outcomes

- Low socioeconomic status/underprivilege
- Language and/or communication barriers
- Limited access to paid sick leave and healthcare

Proportion of key workers in each occupation group by pay decile



COVID-19 and Health Inequalities

- Inequalities in health outcomes from infections are not new: 1918 flu epidemic
- COVID-19 pandemic: OpenSAFELY— Primary care records linked to COVID deaths*
  - Increased risk: age 80+ HR 20.6 (18.7, 22.7); men HR 1.59 (1.5,1.7) and many co-morbidities including diabetes, asthma, respiratory disease, chronic heart disease etc.

Ethnicity[a]	White	1.00 (ref)	1.00 (ref)
	Mixed	1.62 (1.26–2.08)	1.43 (1.11–1.84)
	South Asian	1.69 (1.54–1.84)	1.45 (1.32–1.58)
	Black	1.88 (1.65–2.14)	1.48 (1.29–1.69)
	Other	1.37 (1.13–1.65)	1.33 (1.10–1.61)
IMD quintile	1 (least deprived)	1.00 (ref)	1.00 (ref)
	2	1.16 (1.08–1.23)	1.12 (1.05–1.19)
	3	1.31 (1.23–1.40)	1.22 (1.15–1.30)
	4	1.69 (1.59–1.79)	1.51 (1.42–1.61)
	5 (most deprived)	2.11 (1.98–2.25)	1.79 (1.68–1.91)

*Williamson et al: Nature vol 584, Aug 2020

- Challenging to disentangle the effect of several interrelated risk factors
- Inequalities in Covid related ill-health are associated with
  - social determinants of health (Housing, access to healthcare, living conditions)
  - employment determinants of health
- Example: Many key workers were in the lower 4 pay deciles (H&S care, education/childcare, food & necessary goods)
- Non-white ethnic (BAME) groups disproportionately represented in lower paid work
  - Service section (food, cleaning, delivery services)
  - Designated as key workers

Deaths registered between 9th March and 28th December 2020 and Death Rates per 100,000 (95% CI) involving COVID-19: men aged 20-64, England and Wales

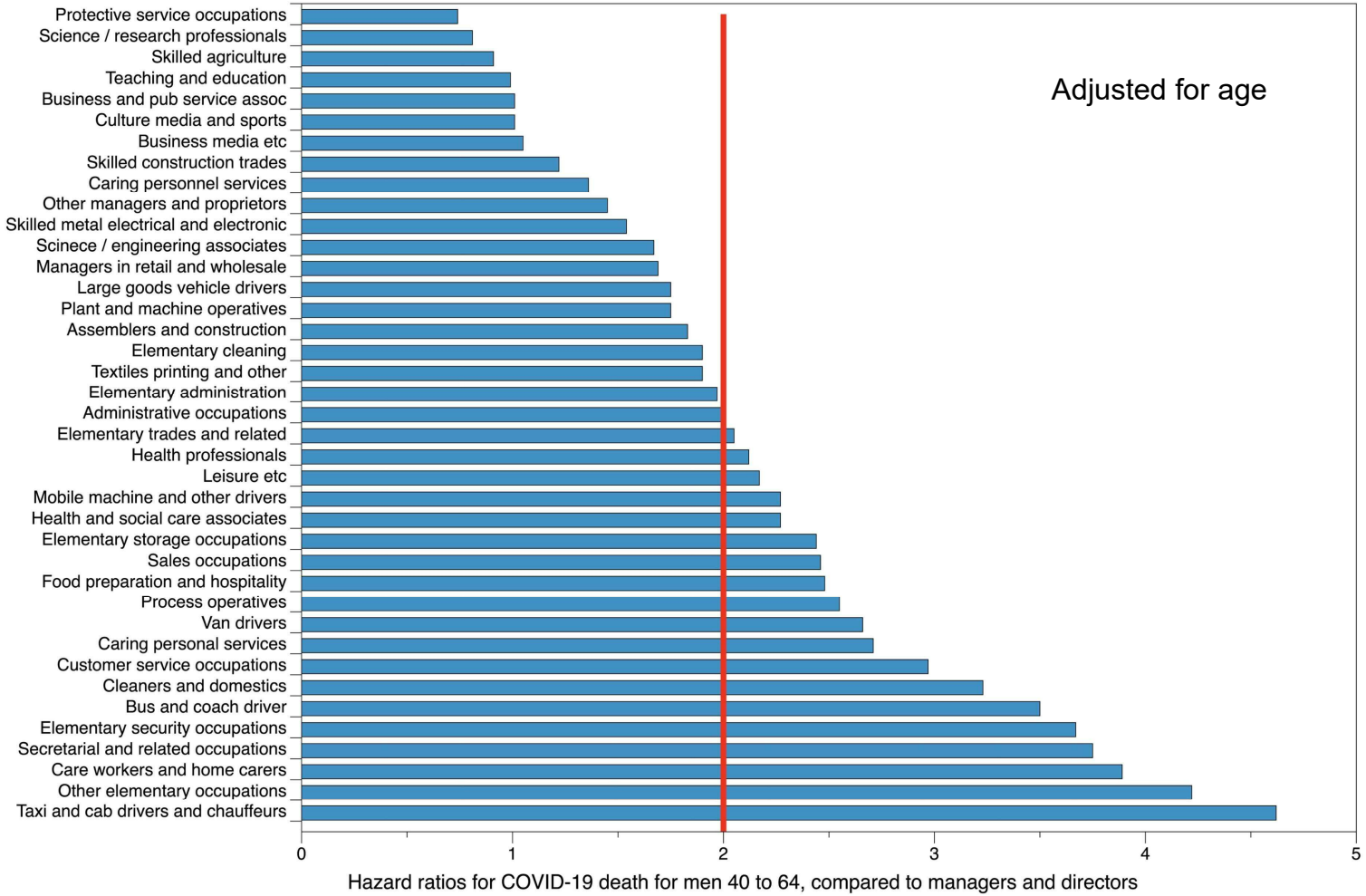
Occupations with 20 + deaths, Relative Risk doubled	Number of Deaths	Death Rate/100,000 (95% CI)	Relative Risk
Restaurant & catering establishment managers & proprietors	26	119.0 (71.2, 183.8)	3.8
Care workers and home carers	107	109.9 (88.6, 141.3)	3.5
Metal working machine operatives	40	106.1 (74.5, 146.0)	3.4
Food, drink and tobacco process operatives	52	103.7 (77.5, 136.4)	3.3
Chefs	82	103.1 (79.9, 130.5)	3.3
Taxi & cab drivers & chauffeurs	209	101.4 (87.5, 115.2)	3.2
Security guards & related occupations	140	100.7 (83.8, 117.6)	3.2
Nursing auxiliaries and assistants	45	87.2 (63.3, 117.1)	2.8
Elementary construction occupations	70	82.1 (63.9, 103.7)	2.6
Nurses	47	79.1 (57.4, 106.1)	2.5
Bus and coach drivers	83	70.3 (55.3, 88.0)	2.4
Local government administrative occupations	23	72.1 (44.8, 109.4)	2.3
Shop keepers & proprietors: wholesale & retail	54	69.0 (51.8, 90.1)	2.2
Cleaners and domestics	58	66.6 (50.3, 86.5)	2.1
Retail cashiers & check out operators	11	61.6 (27.9, 114.7)	2.0

Occupations with 20 + deaths, Relative Risk < 2	Number of Deaths	Death Rate/100,000 (95% CI)	Relative Risk
National government administrative occupations	28	58 .5 (38.8, 84.7)	1.9
Postal workers, mail sorter, messengers, couriers	64	58.2 (44.5, 74.6)	1.9
Vehicle technicians, mechanics & electricians	48	58.0 (42.4, 77.4)	1.8
Kitchen & catering assistants	29	57 (38.0, 81.9)	1.8
Sales & retail assistants	69	56.5 (43.7, 71.9)	1.8
Elementary storage occupations	111	54.0 (43.4, 64.6)	1.7
Occupations with < 20 deaths, Relative Risk > 2			
Bakers & flour confectioners	15	715.6 (331, 1282.8)	22.7
Publicans & managers of licensed premises	19	219.9 (124.7, 354.2)	7.0
Butchers	15	207 (112.2, 346.8)	6.6
Police officers (sergeant and below)	19	194.1 (93.3, 363.3)	6.2
Vehicle valets & cleaners	10	142.9 (60.7, 275.5)	4.6
Hairdressers & barbers	12	112.5 (49.6, 209.8)	3.6
Bank & post office clerks	11	105.5 (49.6, 193.7)	3.4
Roofers, rooftilers & slaters	19	100.5 (55.8, 163.6)	3.2
Waiters and waitresses	14	95.7 (46.6, 169.9)	3.0
Ambulance staff (excluding paramedics)	15	95.2 (38.7, 178.5)	3.0
Catering & bar managers	13	86.8 (41.6, 155.4)	2.8
Hospital porters	18	86.7 (47.7, 142.3)	2.8
Aircraft maintenance & related trades	11	70.8 (34.4, 128.2)	2.3

Deaths registered between 9th March and 28th December 2020 and Death Rates per 100,000 (95% CI) involving COVID-19: women aged 20-64, England and Wales

Occupations with 20 + deaths and Relative Risk >2	Deaths	Death Rate/100,000 (95% CI)	Relative Risk
Care workers and home carers	240	47.1 (41.1, 53.1)	2.8
Occupations with 20 or more deaths but Relative Risk < 2			
Social workers	25	32.4 (20.7, 32.4)	1.9
National government administrative occupations	26	27.9 (18.1, 41.2)	1.7
Sales and retail assistants	111	26.9 (21.8, 31.9)	1.6
Nursing auxiliaries and assistants	54	25.3 (18.9, 33.1)	1.5
Nurses	110	24.5 (19.7, 29.4)	1.5
Occupations with < 20 deaths and Relative Risk > 2			
Sewing machinists	14	64.8 (34.6, 110.1)	3.9
Hairdressers and barbers	18	44.0 (24.2, 72.2)	2.6
Chefs	13	40.2 (20.5, 70.0)	2.4
Houseparents & residential wardens	13	37.4 (18.8, 65.7)	2.2
Shopkeepers & proprietors, wholesale & retail	12	36 (18.0, 63.8)	2.1

Risk of death for different occupations



Nafilyan et al, 2021
https://www.medrxiv.org/content/10.1101/2021.05.12.21257123v1

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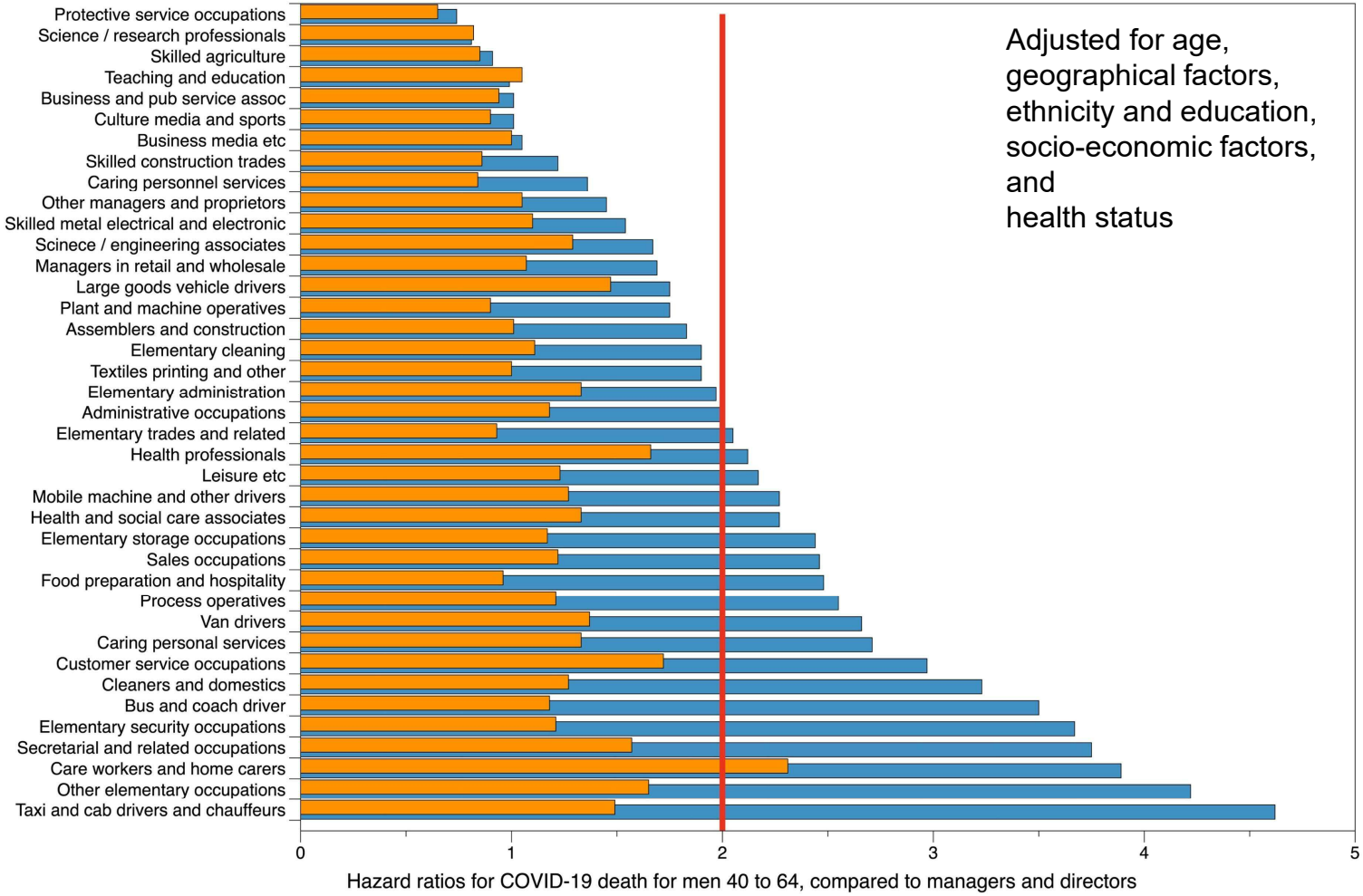

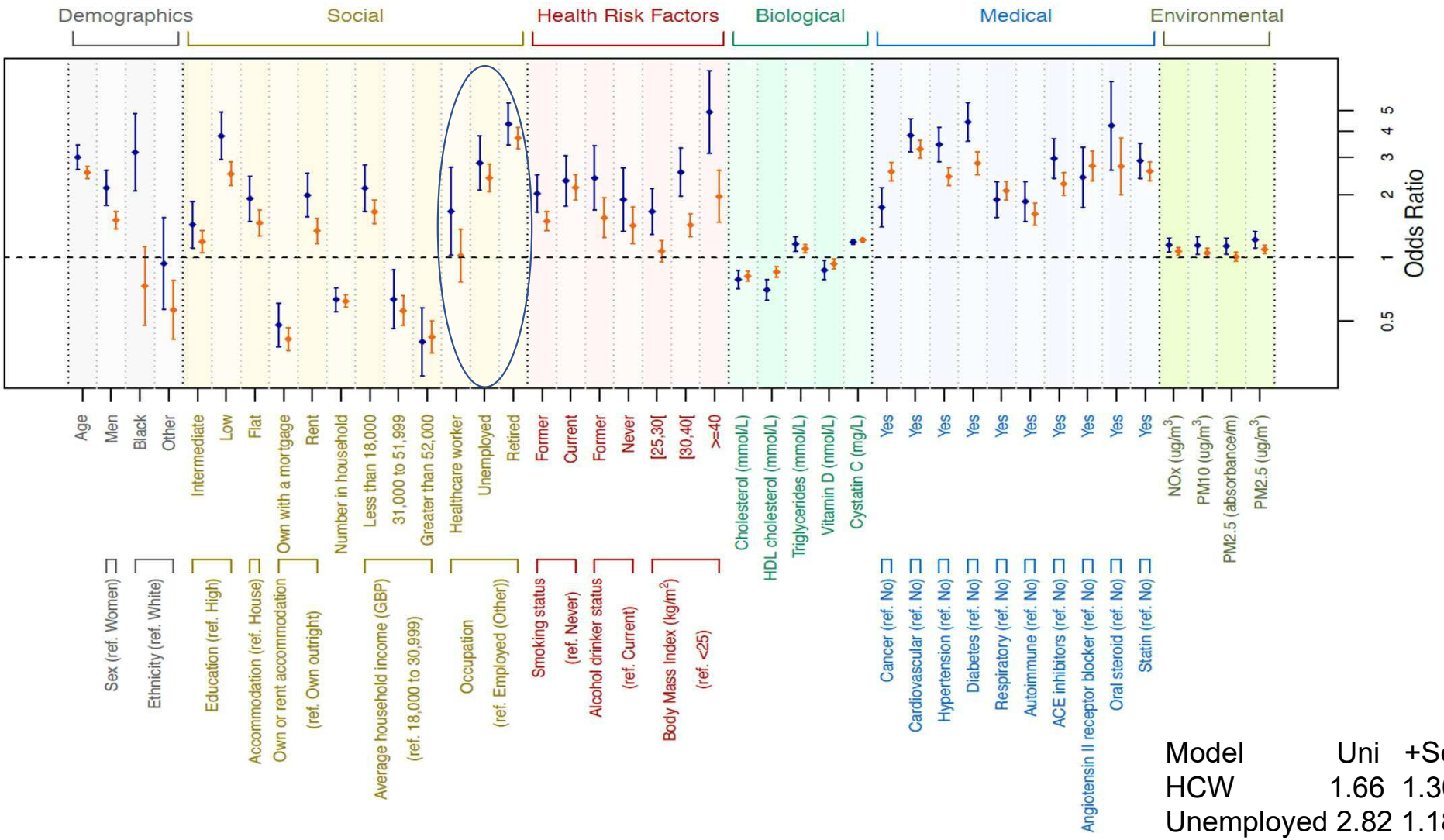

Model	Uni	+Soc	Fully
HCW	1.66	1.30	1.29
Unemployed	2.82	1.18	1.10
Retired	4.31	1.11	1.10

Elliott et al COVID-19 mortality in the UK Biobank cohort - revisiting and evaluating risk factors. EJE 2021

Biobank data on Severe disease by occupation

- Biobank data linked to SARS-CoV-2 test results from PHE (March to July 2020).
- Participants employed or self-employed at baseline, alive and aged <65 years in 2020.
- Estimated severe COVID-19 (+ve test in hospital setting or death) relative to non-essential workers
- Adjusted for baseline demographic, socioeconomic, work-related, health, and lifestyle-related risk factors

	RR (95% CI)*	RR (95% CI)**
Non-essential workers	1	1
Healthcare professionals	6.19	8.99
Medical support staff	8.70	6.42
Health associate professionals	7.53	7.65
Social care workers	2.46	2.13
Education workers	1.36	1.59
Food workers	1.12	0.84
Transport workers	2.20	1.43
Police and security workers	1.55	1.19

Mutambudzi et al
doi:10.1136/oemed-2020-106731

*Model 1 Adjusted for age group, sex, ethnicity, country of birth

**Model 1 + socioeconomic deprivation quartile, education level, BMI category, smoking status, alcohol consumption

Acute Effects of Infection: ‘Complications’

Organ	Complication	Symptoms/Impairment
Respiratory	Persisting inflammation or lung fibrosis	Breathlessness
Hematologic: Coagulopathy	Pulmonary embolism	breathlessness
	Deep venous thrombosis	Leg pain and swelling
Arterial	Ischaemic stroke	Weakness, speech disorder, visual impairment
	Acute myocardial infarction/ acute coronary syndrome	Breathlessness, chest pain
	Intracerebral haemorrhage	Weakness, speech disorder, visual impairment
	Cerebral venous thrombosis	Headaches, nausea, vision impairment
Other cardiovascular	Myocarditis/ pericarditis/ Cardiomyopathy	Chest pain, fatigue, shortness **of** breath, and rapid or irregular heartbeats.
Other neurological	Encephalitis	Headache; Fever; Fatigue, Confusion; agitation or hallucinations; Seizures; Face, Paralysis; Muscle weakness
	Long-term cognitive impairment	
	Guillain-Barre syndrome	Paralysis, breathing difficulties, blurred or double vision, difficulty speaking, problems swallowing
Post-Intensive care syndrome (PICS)	Neuromyopathy	Breathlessness, fatigue, muscle weakness

Post Covid-19 Syndrome: Wide-ranging Symptoms

- Generalized symptoms: Fatigue, Fever, Pain.
- Respiratory: Breathlessness, Cough.
- Cardiovascular: Chest tightness, Chest pain, Palpitations.
- Neurological:
  - Cognitive impairment such as loss of concentration and memory issues.
  - Headache.
  - Sleep disturbance.
  - Peripheral neuropathy including paraesthesia and numbness.
  - Dizziness.
- Gastrointestinal: Abdominal pain, Nausea, Diarrhoea
- Musculoskeletal: joint and muscle pains
- Psychological: depression and anxiety
- ENT: Sore throat, earache, loss of smell, taste
- Dermatological: skin rashes

How many people have Long-Covid symptoms?

Depends on how you ask the question: ONS (April 2020 – August 2021)

Prevalence of any of 12 symptoms 12-16 weeks after infection

Lab-confirmed COVID-19	5.0%
Without +ve test	3.4%

Prevalence of any of 12 symptoms continuously of at least 12 weeks

Lab-confirmed COVID-19	3.0%
Without +ve test	0.5%

Prevalence of self-reported Long-COVID 12 weeks after infection in those with confirmed infection

Any severity	11.7%
Day-to-day activity reduced	7.5%

Depends on who you ask: TUC Survey

3500 respondents – the majority, 3300 self reported having Long COVID.

79% were key workers

29% experienced it > 12 months

52% experienced some form of discrimination at work

So Is Covid an Occupational Disease?

What is an Occupational Disease?

- Any illness associated with a particular occupation or industry; essentially these are preventable.
- Can arise from various biological, chemical, physical, psychological factors present in the work environment or encountered in the course of employment

Occupational disease ≠> Worker Compensation

- Tendency to assume that an occupational disease is one for which compensation may be paid
- However, many countries exclude certain occupationally-related diseases e.g. MSK, mental health

Both acceptance as an occupational disease and compensation vary widely across different countries.

- Often insurance based schemes
- Burden of proof is on the individual e.g. of exposure at work
- Restricted to select occupations

Worker compensation in the UK

Industrial Injuries Disablement Benefit (IIDB)

- Provides non-contributory, no-fault benefits for disablement because of
  - an accident at work
  - one of 70 + prescribed diseases known to be a risk from certain jobs.
- Only covers employed earners i.e. employment under a contract of service or an office holder
- Key feature of IIDB: benefit of presumption – allows decision makers to presume a disease is due to occupation

Industrial Injuries Advisory Council (IIAC)

- Statuary body established under National Insurance (Industrial Injuries) Act 1946
- Provides independent advice to Secretary of State for Work & Pensions on the Scheme

Defining Post Covid Complications for Potential IIDB

IIDB works best for disease entities

- With measurable diagnostics
- Having adverse health consequences causing some loss of faculty/function likely to lead to one or more disabilities
- New onset disease

For sequelae of Covid-19 - in addition to the above:

- Timing of the relevant infection (Whole pandemic or limited infection period)
- Evidence needed of infection (PCR, doctor diagnosed, hospitalisation)
- Timing of occurrence of disease (within how many weeks)
- Diagnosis methods for each disease
- Disability evaluation

Which occupations?

- Health and Social Care workers: all; patient facing; public and patient facing?
- Transport workers: bus and coach? Taxi and cab?
- All those involved in an outbreak?

Summary

- Established that workers in many occupations are at greater risk of being
  - Infected with SARS-CoV-2
  - Developing COVID-19, with increased risk of severe disease
  - Dying as result
- Good evidence from patient data of serious complications that may lead to long-term loss of function and potential disability
- Knowledge of Post COVID-19 Syndrome is accumulating but currently few studies of long-term effects and disability
- Very little relating occupation to complications or post-Covid-19 syndrome

What do we urgently need?

- Occupation as a data field to be routinely collected in all health and social data systems
- Good quality studies of long-term health outcomes of Covid in occupational settings

YES, Covid should be in the occupational fast lane

Table 3 Vaccination rates and odds ratios for not being fully vaccinated for SOC unit groups, top and bottom 20

Occupation	Population	Number vaccinated	Vaccination rate	Age standardised rate	Unadjusted OR	Fully adjusted OR
Packers, bottlers, canners and fillers	72,464	55,838	77.1 (76.8 - 77.4)	76.5 (75.9 - 77.1)	2.24 (2.21 - 2.28)	1.43 (1.40 - 1.45)
Health associate professionals n.e.c.	21,136	16,318	77.2 (76.6 - 77.8)	76.7 (75.5 - 77.9)	2.22 (2.15 - 2.29)	3.00 (2.90 - 3.10)
Fitness instructors	18,657	14,511	77.8 (77.2 - 78.4)	78.6 (77.3 - 79.9)	2.14 (2.07 - 2.22)	2.29 (2.21 - 2.38)
Vehicle valeters and cleaners	14,511	11,402	78.6 (77.9 - 79.2)	79.2 (77.8 - 80.7)	2.05 (1.97 - 2.13)	1.28 (1.23 - 1.33)
Elementary construction occupations	80,244	63,166	78.7 (78.4 - 79.0)	77.7 (77.1 - 78.4)	2.04 (2.00 - 2.07)	1.52 (1.49 - 1.55)
Waiters and waitresses	52,218	41,224	78.9 (78.6 - 79.3)	81.0 (80.2 - 81.9)	2.01 (1.96 - 2.05)	1.18 (1.15 - 1.20)
Market and street traders and assistants	8,831	7,084	80.2 (79.4 - 81.0)	77.5 (75.6 - 79.4)	1.85 (1.76 - 1.95)	1.45 (1.37 - 1.53)
Plasterers	26,578	21,310	80.2 (79.7 - 80.7)	79.4 (78.3 - 80.5)	1.86 (1.80 - 1.91)	1.62 (1.57 - 1.67)
Scaffolders, stagers and riggers	14,606	11,737	80.4 (79.7 - 81.0)	80.8 (79.4 - 82.3)	1.83 (1.76 - 1.91)	1.61 (1.54 - 1.68)
Actors, entertainers and presenters	19,150	15,422	80.5 (80.0 - 81.1)	81.0 (79.7 - 82.3)	1.81 (1.75 - 1.88)	1.61 (1.55 - 1.68)
Industrial cleaning process occupations	10,974	8,862	80.8 (80.0 - 81.5)	78.6 (76.9 - 80.3)	1.79 (1.70 - 1.87)	1.40 (1.33 - 1.47)
Bar staff	55,784	45,076	80.8 (80.5 - 81.1)	82.5 (81.7 - 83.3)	1.79 (1.75 - 1.82)	1.51 (1.47 - 1.54)
Leisure and theme park attendants	4,797	3,881	80.9 (79.8 - 82.0)	81.9 (79.3 - 84.5)	1.77 (1.65 - 1.90)	1.39 (1.28 - 1.49)
Tailors and dressmakers	8,687	7,030	80.9 (80.1 - 81.8)	79.7 (77.8 - 81.6)	1.77 (1.68 - 1.86)	1.16 (1.09 - 1.22)
Elementary security occupations n.e.c.	9,977	8,099	81.2 (80.4 - 81.9)	80.6 (78.9 - 82.4)	1.74 (1.65 - 1.83)	1.40 (1.32 - 1.47)
Roofers, roof tilers and slaters	25,969	21,078	81.2 (80.7 - 81.6)	80.3 (79.2 - 81.4)	1.74 (1.69 - 1.80)	1.55 (1.50 - 1.60)
Fork-lift truck drivers	39,486	32,148	81.4 (81.0 - 81.8)	80.5 (79.7 - 81.4)	1.71 (1.67 - 1.76)	1.25 (1.22 - 1.29)
Window cleaners	16,746	13,648	81.5 (80.9 - 82.1)	80.0 (78.7 - 81.4)	1.70 (1.64 - 1.77)	1.53 (1.47 - 1.60)
Food, drink and tobacco process operatives	90,746	73,959	81.5 (81.2 - 81.8)	80.8 (80.3 - 81.4)	1.71 (1.68 - 1.74)	1.17 (1.15 - 1.19)
Therapy professionals n.e.c.	11,688	9,566	81.8 (81.1 - 82.5)	80.7 (79.0 - 82.4)	1.66 (1.59 - 1.74)	2.36 (2.24 - 2.48)
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Thank you