



The Chartered Society for  
Worker Health Protection

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## **BOHS – Covid-19: Occupation Risk Rating and Control Options According to Exposure Rank**

### **Introduction**

In the early stages of the Covid-19 pandemic our colleague Professor John Cherrie (Principal Scientist at Institute of Occupational Medicine) suggested a risk matrix illustrating control options for key workers arranged according to likely exposure would be a useful tool for occupational hygienists and others seeking to select and apply control measures in a manner proportionate to risk.

Given the reliance on respiratory protective equipment (RPE) in the early stages of the epidemic the BOHS Covid-19 RPE Working Group initially took up development of the matrix under the guidance of Professor Raymond Agius (Emeritus Professor of Occupational and Environmental Medicine at The University of Manchester). It was soon agreed that the risk matrix should reflect the control hierarchy and final development was undertaken by the BOHS Covid-19 Control Measures Working Group.

The risk matrix is by no means intended as the last word on this subject and we welcome further evidence to improve it which can be sent to [admin@bohs.org](mailto:admin@bohs.org). We are of course conscious of the rapid progress in the science relating to the virus, its transmission and infectivity.

### **The Risk Matrix**

The matrix initially provides generic occupational descriptions sorted according to primitive factors that affect the level of risk (eg; public or non-public facing, chance of contact with infected individuals). The generic occupational descriptions are expanded into examples of occupational groups represented by each generic occupational description. At the outset, the occupational groups were selected to represent “key workers”, however the examples have been expanded somewhat to include groups such as nail bar workers.

It is hoped that the range of occupational groups selected will enable a reader to find a description analogous to their situation, should their specific occupational group not be explicitly described.

The “Exposure Rank” and “Control Band” elements of the risk matrix draw on work and a recent presentation by Lisa Brosseau, Professor (retired), Research Consultant, University of Minnesota Center for Infectious Disease Research and Policy, entitled “Infectious dose can it inform COVID -19 Decisions?”. The work gathers recent research relating to infectious dose and transmission to provide an approach to exposure ranking and control banding. We are grateful to Lisa Brosseau and colleagues for their contribution and also to John Dobbie (Group Industrial Hygiene Director -BP) for not only drawing this work to our attention but also providing a control options template and examples of it’s application in the workplace.

### **Control Options**

There has been much discussion over the granularity of the Control Options included in the matrix. For example, we have not defined a meaning of “regular” surface cleaning or details for ventilation.

ventilation.

Our expectation is that the matrix will serve as a guide to facilitate local decision making, with the control measure specifics being worked out by professionals on the ground.

We hope the level of detail provided is sufficient for this intended purpose, however we welcome all feedback on how the Control Options outline may be improved.

### **Occupation Risk Rating According to Age Standardised Mortality Rate (ASMR)**

We have included a section on occupation risk rating according to ASMR. This has been included to draw attention to high risk occupational groups and also some disparities between risk rating according to the risk matrix Exposure Rank and the ASMR (e.g.; vehicle technicians, chefs and food processing operatives).

In due course the ASMR for various occupations will be updated and we will seek to update the risk matrix to suit.

The reasons for disparities between risk rating according to the risk matrix Exposure Rank and the ASMR are uncertain at time of writing but seem likely to include demographic and other non-occupational factors.

### **Concluding Remarks**

As stated above, this risk matrix does not by any means pretend to be the last word on the subject, but we trust it serves in the short term to help occupational hygienists and others gauge a proportional response in selection of control measures.

In the medium to long term we welcome the development of this tool and tailoring of the approach to the particular needs of other occupational health professionals.

We hope that evolution of the tool will serve in preparedness for management of future pandemic situations.

### **Acknowledgement**

We are grateful for the commitment and contribution of all our expert volunteers serving on the BOHS Covid-19 Working Groups in the production of the risk matrix.

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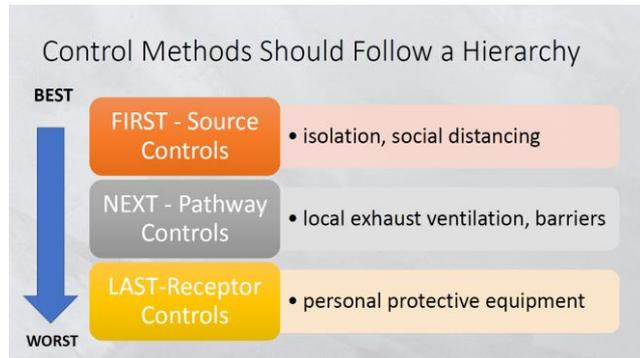
Control Banding

Exposure = Likelihood x Duration

Likelihood	Daily Duration		
	D1 (0 to 3 hours)	D2 (3 to 6 hours)	D3 (> 6 hours)
L0 (No Exposure)	E0	E0	E0
L1 (Exposure Unlikely)	E1	E1	E1
L2 (Possible Exposure)	E2	E2	E3
L3 (Exposure is Likely)	E2	E3	E4

Control Band

Exposure Rank	Control Band
E0	N
E1	A
E2	B
E3	C
E4	D



	Control Band	Control Options
<b>Aim to lower exposure level</b> <b>Goal:</b> Reduce exposure to E1 levels by selecting additional control strategies from the source and pathway categories and reducing reliance on PPE	A	Source – Do these first
		Pathway – Maybe necessary
		Receptor – Not necessary
	B	Source – Do these first, may require multiple options
		Pathway – Do these next, and may require multiple options
		Receptor – Only if source & pathway controls aren't effective
	C	Source – Do these first, may require multiple options
		Pathway – Do these next, and may require multiple options
		Receptor – May be prudent
	D	Source – Do these first, may require multiple options
		Pathway – Do these next, and may require multiple options
		Receptor – Probably necessary

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## Occupation Risk Rating and Control Options According to Exposure Rank

Generic Occupational Description		Examples of Occupational Groups	Comments	Exposure Rank	Control Band	Control Options		
						Source	Pathway	Receptor
1	Care workers in the vicinity of AGPs involving infected patients:	ICU staff, doctors, nurses, dentists, surgical staff	AGP= Aerosol Generating Procedures. General ventilation requirements will require special considerations pertaining to clinical environment.	E4	D	Isolation of patient, restricted staff access, regular surface disinfection. Visor or facecovering on patient	LEV, General ventilation, regular surface disinfection	Preferably PAPR, otherwise minimum FFP3 and visor, gown, gloves and/or hygiene - hand washing/hand sanitizing.
2	Care workers not in the vicinity of AGPs involving infected patients:	Doctors, nurses, dentists, surgical staff, social care staff		E4	D	Isolation of patient, restricted staff access, regular surface disinfection. Visor or facecovering on patient	Barrier / enclosure, General ventilation, regular surface disinfection	Minimum FFP3 and visor, gown, gloves and/or hygiene - hand washing/hand sanitizing.
3	Care workers where infected patients may be present	OP clinic, GP practice, generic A & E, Ambulance staff, care home staff, Therapists (eg; counsellors psychologists), nurses, physiotherpists, midwives, pharmacists, optometrists, ICU auxiliary workers and assistants	First aiders may not be health care professionals but need to adopt measures describe here	E4	D	Isolation of patient, restricted staff access, regular surface disinfection	Barrier / enclosure, General ventilation, regular surface disinfection	Minimum FFP3 and visor, gown, gloves and/or hygiene - hand washing/hand sanitizing.
4	Public facing workers - high risk face to face contact (distancing cannot be assured)	Police officers, Police community support officers, Traffic officers, Firefighters, Social services, Therapists (eg; counsellors, psychologists), Prison officers and other staff, legal professionals, school teachers, nursery nurses, child care staff, education support staff, public transport staff (eg; train stewards, air line stewards), first aiders, ministers of religion, nail bar workers, hairdressers, taxi cab drivers, chauffeurs, security guard and related work, bus and coach drivers, sales and retail, chefs, supermarket cleaning hygiene staff, Police community support officers, Traffic officers,	Reasonable to anticipate regular close distance (<2m) or extended duration of contact in enclosed spaces (eg; interview room).	E3	C	Require distancing and hand washing / sanitisation by public as far as practicable, implement government advice on face coverings	Barriers, regular surface disinfection of frequent touch points, one way systems as far as reasonably practicable, general ventilation, avoid retail cash payments,	FFP2 should be considered for prolonged contact, otherwise fluid resistant masks, visor, gloves and/or hygiene - hand washing/hand sanitizing.
5	Public-facing workers - low risk face to face contact (distancing is practicable)	Civilian police staff, probation service staff, bus drivers or supermarket employees, hospitality, restaurant / café, gyms, lecturers, personal advisors (financial, law etc.), Fire safety engineers, Retail staff, Railways maintenance staff, Railway freight staff, Delivery drivers, Environmental Health officers, postal services, essential civil service (benefits, border control, etc.), Occupational hygienists, some Ministry of defence personnel, health and safety advisors, local authority planners, charity staff (eg; foodbanks), funereal staff, journalist and broadcasting, , telecommunication engineers, waste collection, veterinary services,	Presuming that distancing can be enhanced by barriers and other workplace arrangements such as one-way routes and staggered shift patterns.	E2	B	Distancing, frequent hand washing / sanitisation by public as far as practicable	Barriers, regular surface disinfection of frequent touch points, one way systems as far as reasonably practicable, general ventilation	Visor / safety spectacles & fluid resistant mask and/or hygiene - hand washing/hand sanitizing.
6	Non public facing services where distancing may not be practicable	Food production staff, Engineering maintenance, financial services, energy (eg; nuclear, oil and gas, electricity), telecommunications, utilities (eg water), call centre staff, agriculture	Presuming control of workplace arrangements is more consistent, ie; public not present, screening of staff, cohorting and quarantine arrangements etc.	E2	A	Distancing, frequent hand washing / sanitisation	Regular surface disinfection of frequent touch points, one way systems as far as reasonably practicable, general ventilation	Visor / safety spectacles & fluid resistant mask and/or hygiene - hand washing/hand sanitizing.
7	Non public facing services where distancing is practicable	Financial services, energy (eg; nuclear, oil, gas, electricity), telecommunications, utilities (eg; water, sewerage), Food distribution, cleaning hygiene staff	Presuming control of workplace arrangements is more consistent, ie; public not present, screening of staff, cohorting and quarantine arrangements etc. Very low risk band	E1	A	Normal social distancing as advised for general population.	Regular surface disinfection of frequent touch points, one way systems as far as reasonably practicable, general ventilation	Hand washing/sanitizing as advised for general population.
8	Ability to work exclusively from home in isolation or within household 'bubble'	Possibly personal advisors, some civil service and administration staff	Exposure more likely to come from non-occupational sources.	E0	N	Normal social distancing as advised for general population.	Nil	Hand washing/sanitizing as advised for general population.

**Occupation Risk Rating (in descending order) According to Age Standardised Death Rate (per 100,000 with 95% CI; rate at least twice as high as comparator; registered at least 20 deaths)**

ONS SOC Ref:		Specific Occupation	Age Standardised Death Rate	Comments	Exposure Rank
<b>Minor</b>	<b>Unit</b>				
	9231	Security Guards and related occupations	74	Possible non occupational factors	E3
	6135	Care workers and home carers	71.1		E4
	8213	Taxi & cab drivers and chauffeurs	65.3		E3
	8111	Food, drink and tobacco process operatives	64.3	Note: cause of meat worker outbreaks unresolved	E2
	6131	Nursing Auxiliaries and assistants	58.9		E3
	5434	Chefs	56.8	Possible non occupational factors	E2
223		Nurses	50.4		E4
	5231	Vehicle Technicians, mechanics and electricians	44.3	Possible non occupational factors	E2
	8212	Bus and Coach drivers	44.2		E3
	9129	Elementary construction occupations	42.1	Possible non occupational factors	E2
	9223	Cleaners and domestics	38.3		E1
		<b>Comparators</b>			
		All males, 29-64 years	19.1		
		All females, 29 - 64 years	9.7		