COVID-19 Mitigation at the Workplace

“How to prevent COVID-19 from spreading and closing down your workplace”

By Dato’ Dr Neoh Soon Bin
and the COVID-19 Task Force of Soon Soon Group of Companies

Agenda

Preventing the spread of COVID-19 in your workplace

- The COVID-19 situation in Malaysia
- What is COVID-19
- Why do we need to prevent the spread of COVID-19 in our work place
- Setting up a high level COVID-19 Task Force
- Applying the basic MOH principles of Practising 3W (Wash, Wear and Warn) and Avoidance of 3C (Confined Space, Crowded Space and Close Conversation) to deliver an effective COVID-19 Control Program based on contact tracing and risk assessment
- Using a technical & engineering approach to manage the airflow and purify the air-conditioning system to prevent the spread of the virus
- Instituting awareness among staff
- Take home messages
- Potential emerging issues

Majority new COVID-19 Clusters from Workplace!

Date	No. of new clusters	No. of workplace clusters	No. of other clusters
19/02/2021	13	10	3
20/02/2021	10	10	0
21/02/2021	6	6	0
22/02/2021	8	7	1
23/02/2021	13	11	2
24/02/2021	8	7	1
25/02/2021	8	5	3
Total	66 (100%)	**56 (85%)**	10 (15%)

Source: MOH

Stern action from Government to curb COVID-19 rise in factories

Covid-19: Govt to temporarily close factories, business premises that violate SOP, cause infections — Ismail Sabri

Bernama / Bernama
January 28, 2021 20:48 pm +08

KUALA LUMPUR (Jan 28): The government will temporarily shut down factories and business premises that fail to comply with the standard operation procedure (SOP) on Covid-19 prevention and cause infections to occur.

Senior Minister (Security) Datuk Seri Ismail Sabri Yaakob said stern action would also be taken against factory operators who fail to ensure that their foreign workers undergo mandatory Covid-19 screening tests.

He said nine factories and 16 business premises, which are not allowed to operate during the Movement Control Order (MCO) period as they are not on the list of essential services, have been ordered to shut down by the International Trade and Industry Ministry (MITI).

"We are serious about ensuring there are not Covid-19 infections in factories, including closing them down temporarily until all Covid-19 cases have recovered. We will also ensure that their workers are free from Covid-19," he said at the media conference on MCO development here today.

There has been a rise in Covid-19 positive cases and clusters involving workplaces, which have contributed to a spike in daily cases.

What is COVID-19?

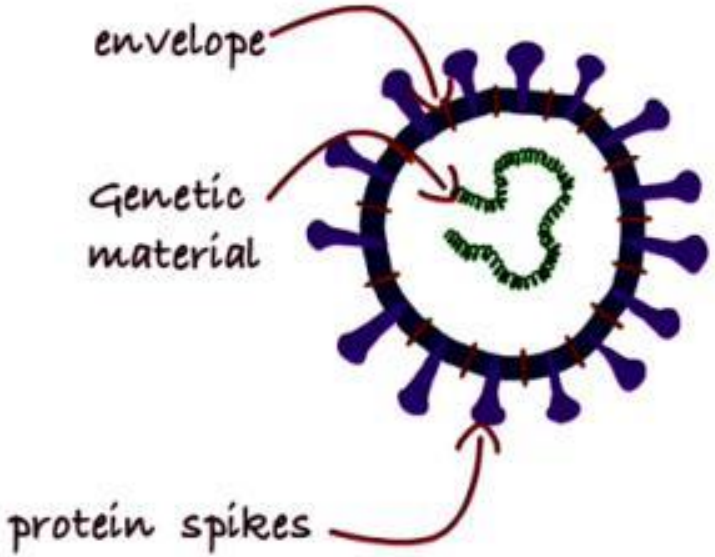
Note:

SARS CoV2 = Virus

COVID-19 = Disease

CORONAVIRUSES

large group of viruses



crown = "corona"

different types

respiratory gastrointestinal

common cold

pneumonia

generally mild disease

some cause severe disease

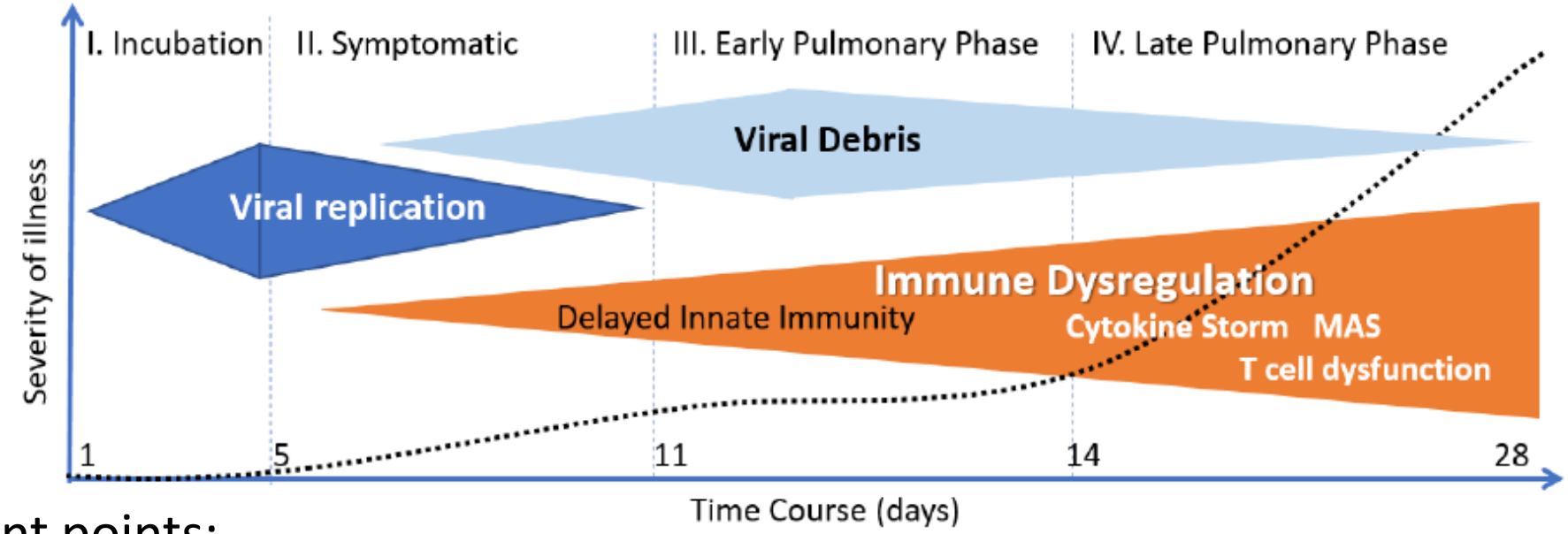
SARS - CoV China - 2003

MERS - CoV Saudi Arabia - 2012

SARS - CoV2 China - 2019

World Health Organization

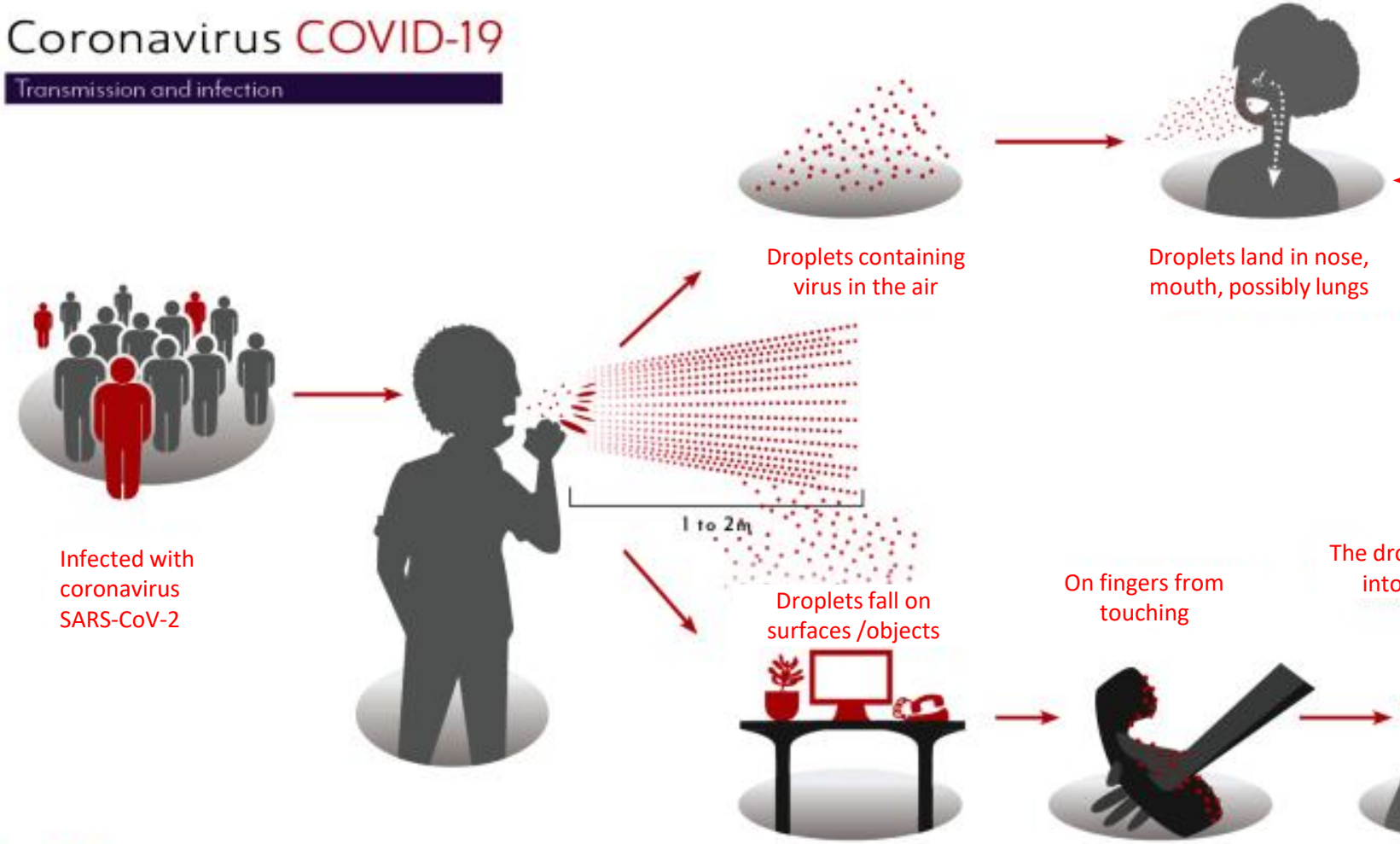
Understanding COVID-19 infection timeline



Important points:

1. Incubation period is average 5 days after exposure
2. Symptoms appear at about Day 5 when viral replication is at its max
3. Viral replication eventually stops at day 10 after exposure
4. Therefore, patients if recovered should be not infectious after Day 10
5. However, virus and viral debris can trigger a delayed innate immunity reaction leading to an immune dysregulation and cytokine storm and the disease can progress to the lung and other organs
6. Therefore, the challenge is to prevent infected people from infecting their close contacts and to prevent them from progressing into pulmonary phase

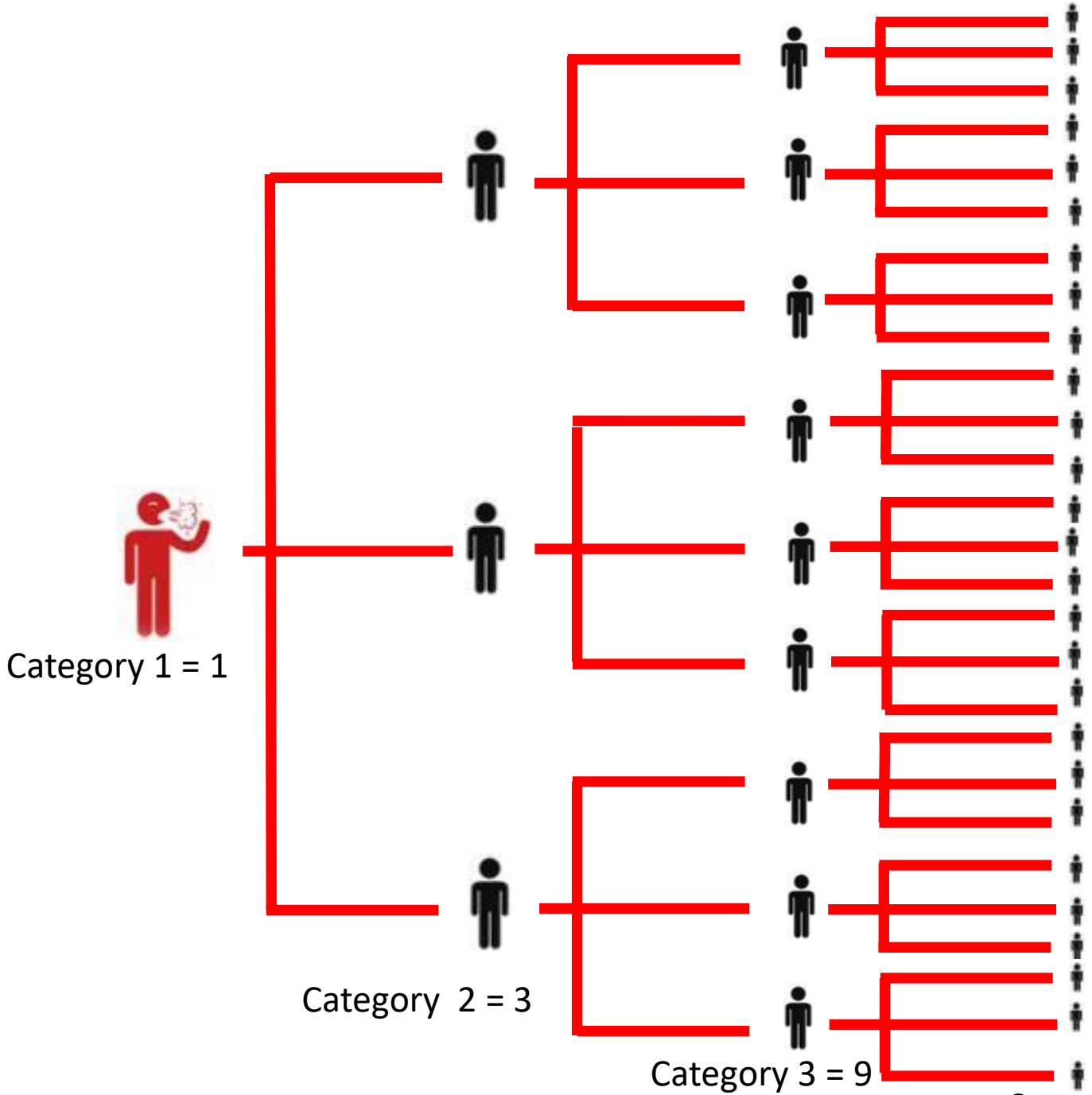
How COVID-19 is spread?



Therefore one of the key area to manage COVID-19 is to have SOCIAL DISTANCING, AIR-CON MANAGEMENT and SANITIZATION of SURFACES!

WORLD HEART FEDERATION

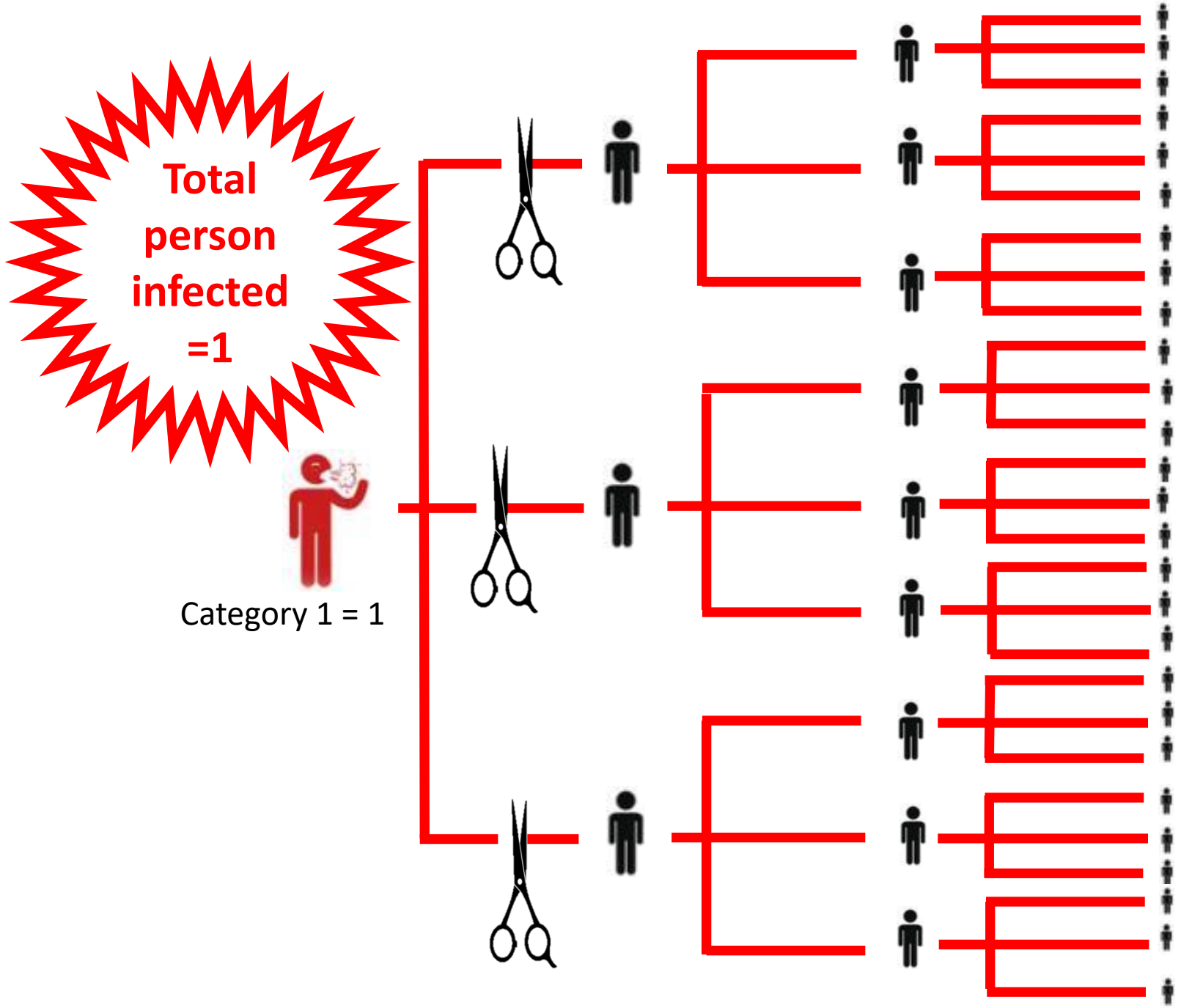
UNIVERSITY OF CAPE TOWN



If not managed, COVID-19 can spread quickly

Total 40 persons infected

This will likely result in the closure of the workplace

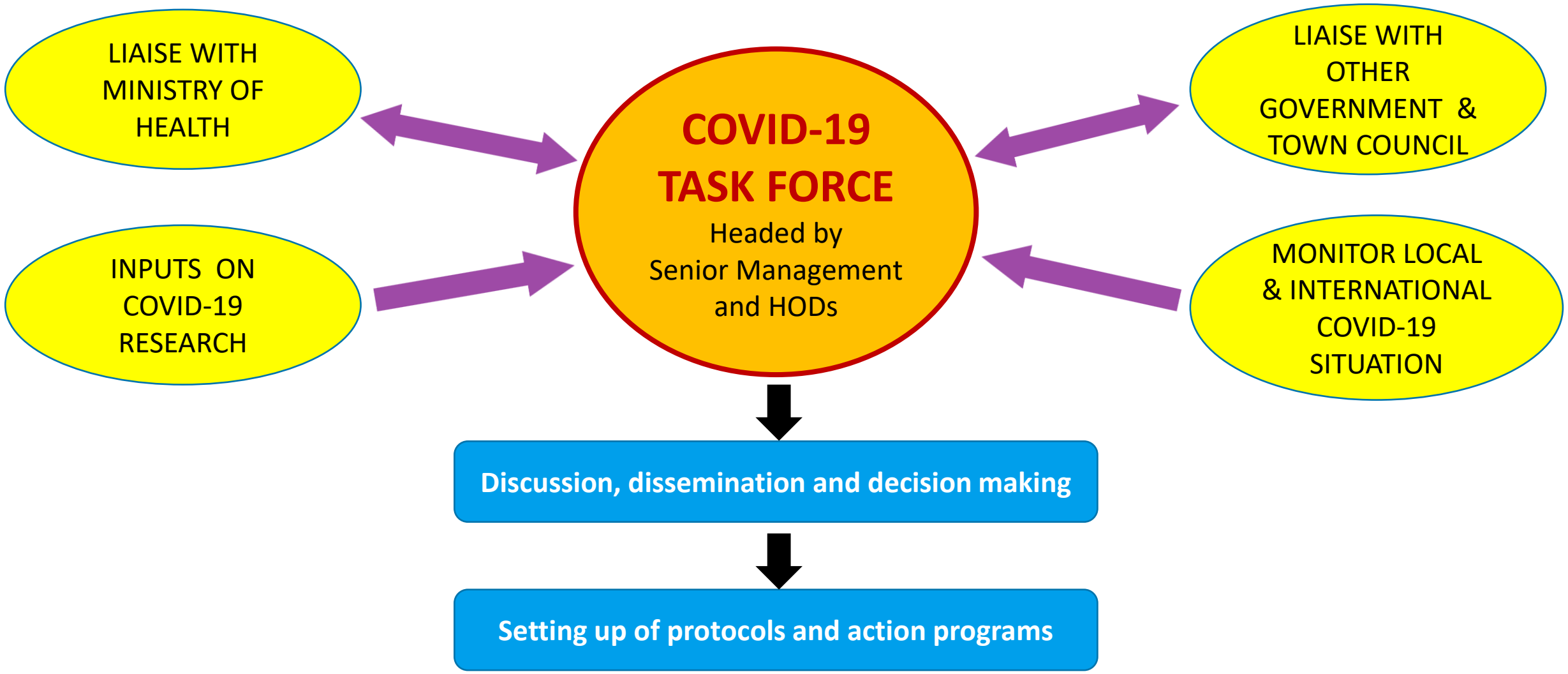


The only way to prevent COVID-19 from spreading in your workplace is to **break the chain** of infection from the Category 1 person to Category 2 persons

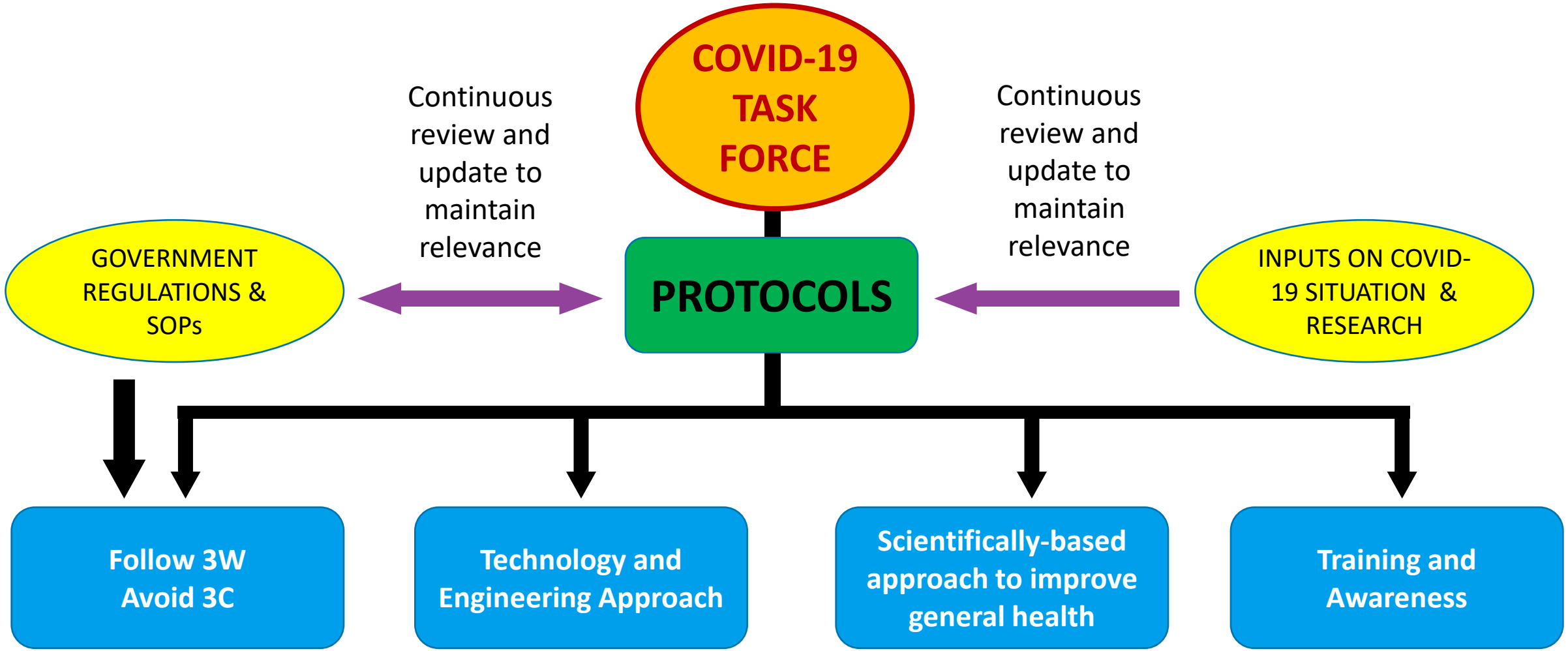
Steps required to set up a complete COVID-19 mitigation plan in your workplace

1. Set up a high level COVID-19 task force
2. Set up a contact tracing and risk assessment program
3. Implementation of the MOH's SOP '3W and 3C' in your workplace
4. Manage your foreign workers housing, transport, and observing 3W and 3C to avoid the spread of COVID-19
5. Increase air flow rates and/or using Plasmacluster ioniser and UVC Light to reduce viruses in air-conditioned areas.
6. Try to improve the general health of our workers with supplements, vitamins and minerals
7. Continuous education and awareness

First set up a high level COVID-19 task force involving senior management and head of departments



Mitigation Program



Most important assumptions

- You cannot prevent a COVID-19 positive person from entering your workplace since 80% of younger people do not have symptom or only have mild symptom which does not result in any fever

- You have to assume that everyone of your staff is a potential COVID-19 spreader and your mitigation protocol must be able to prevent them from spreading COVID-19 in your workplace

Most Important 1st Step

The most important step you need to take is to control the spread of COVID-19 in your workplace is by setting up a Close Contact Tracing and Risk Assessment Program.

Who are Close Contacts?

MOH define Close Contacts as follows:

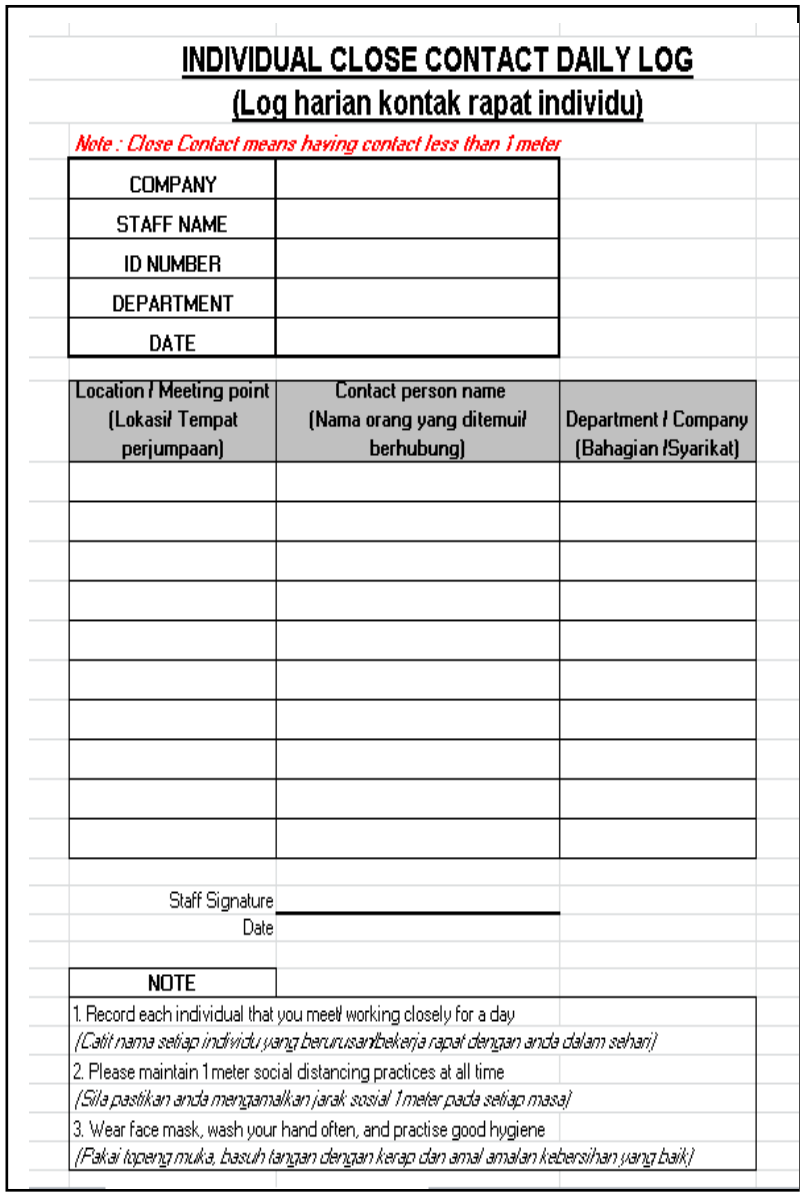
1. Family members in the same house/working partners in office /classmates with COVID-19 positive case.
2. More than 15 minutes communication and less than 1 metre away distance in a confined space with the COVID-19 positive person.
3. In an office environment like an air-conditioned office or meeting room (even though you are sitting more than 1 metre away from COVID-19 patient) for more than 2 hours.
4. Passer-by that cause transmission of water droplets (a COVID-19 positive person who is coughing and sneezing & not wearing any mask passing by a healthy person).
5. Being together in the same car with distance of less than 2 car seats away from COVID-19 positive person

Guidance provided by MOH for identifying COVID-19 status

STATUS	KATEGORI	PROSEDUR YANG PERLU ANDA LAKUKAN	PERUBAHAN KATEGORI
Pesakit yang telah disahkan **positif COVID-19**	1	Sekiranya tidak bergejala atau bergejala ringan dan memenuhi kriteria lain yang ditentukan, anda boleh menjalani pemantauan dan pengasingan di rumah selama tempoh yang ditetapkan. Untuk yang bergejala teruk atau mempunyai ko-morbiditi, anda akan dirujuk ke hospital atau Pusat Kuarantin dan Rawatan COVID-19 Berisiko Rendah untuk rawatan lanjut. Swab ulangan tidak diperlukan.	**ANDA ADALAH KES POSITIF COVID-19**
Individual yang mempunyai **KONTAK RAPAT** dengan individu dari **kategori 1**	2	Anda perlu kuarantin di rumah selama 10 hari. Ujian COVID-19 perlu dijalankan untuk yang bergejala atau atas arahan Pejabat Kesijatan Daerah (PKD). Swan ulangan tidak diperlukan melainkan atas arahan PKD.	Sekiranya keputusan ujian COVID-19 adalah **positif**, status anda akan bertukar ke **kategori 1**. Sekiranya keputusan ujian COVID-19 adalah **negatif**, teruskan kuarantin di rumah selama 10 hari.

STATUS	KATEGORI	PROSEDUR YANG PERLU ANDA LAKUKAN	PERUBAHAN KATEGORI
Individu yang mempunyai **KONTAK RAPAT** dengan individu dari **kategori 2**	3	Digalakkan bekerja dari rumah. Jika terpaksa bekerja, hadkan pergerakan antara rumah dengan tempat kerja sahaja. Di tempat kerja, elakkan berinteraksi secara bersemuka dengan orang awam dan rakan sekerja serta patuhi SOP yang ketat. Tempoh: Selama 10 hari daripada hari terakhir pendedahan kepada individu kategori 2 atau sehingga keputusan beliau diperolehi. Sekiranya anda kontak rumah, amalkan penjarakan fizikal dengan individu kategori 2 termasuk elakkan makan atau tidur bersama.	Sekiranya kontak rapat kategori 2 disahkan COVID-19 **positif**, status anda akan bertukar ke kategori 2.
Individu yang mempunyai **KONTAK RAPAT** dengan individu dari **kategori 3**	4	Tiada larangan khusus. Sila dapatkan perkembangan status kategori 3 samada bertukar menjadi kategori 2.	Sekiranya kontak rapat anda dalam kategori 3 telah bertukar menjadi kategori 2, status anda akan bertukar dari **kategori 4 ke kategori 3**.

Individual Close Contact Daily Log



INDIVIDUAL CLOSE CONTACT DAILY LOG
(Log harian kontak rapat individu)

Note : Close Contact means having contact less than 1 meter

COMPANY	
STAFF NAME	
ID NUMBER	
DEPARTMENT	
DATE	

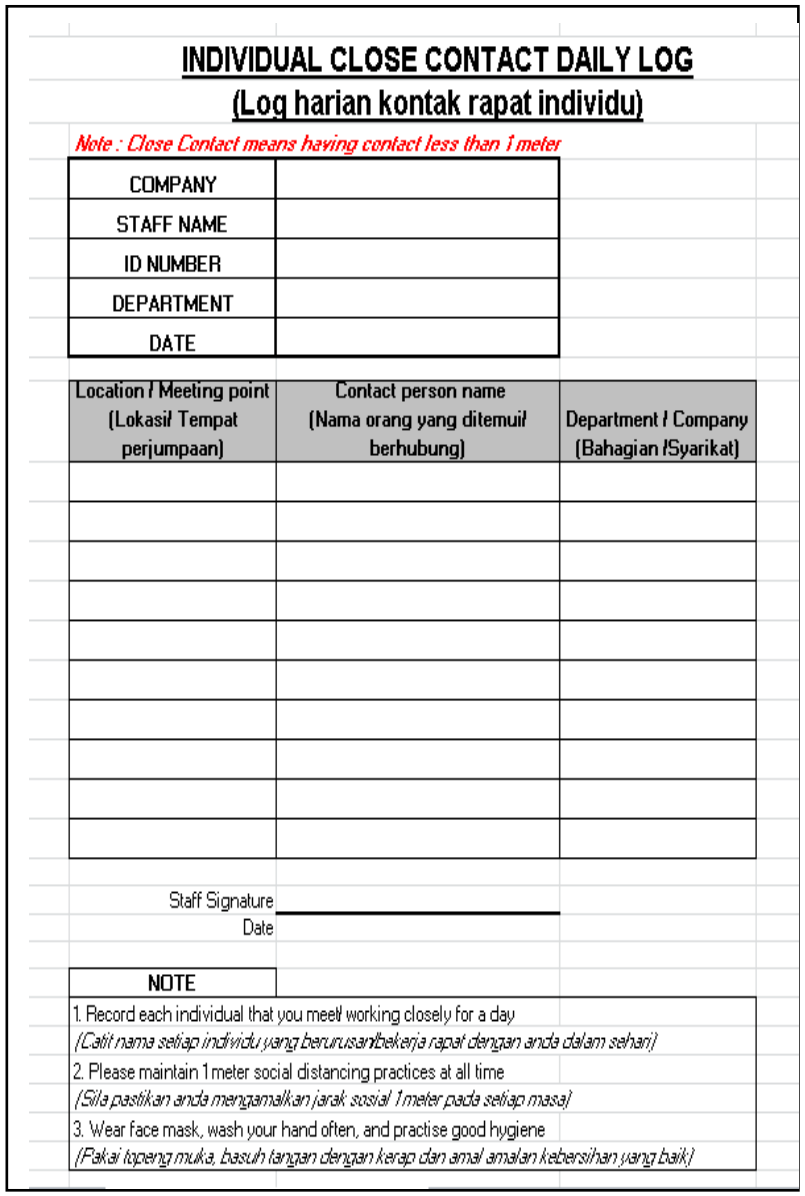
Location / Meeting point (Lokasi/ Tempat perjumpaan)	Contact person name (Nama orang yang ditemui/ berhubung)	Department / Company (Bahagian /Syarikat)

Staff Signature _____
Date

NOTE
1. Record each individual that you meet/ working closely for a day
(Catit nama setiap individu yang berurusan/bekerja rapat dengan anda dalam sehari)
2. Please maintain 1 meter social distancing practices at all time
(Sila pastikan anda mengamalkan jarak sosial 1 meter pada setiap masa)
3. Wear face mask, wash your hand often, and practise good hygiene
(Pakai topeng muka, basuh tangan dengan kerap dan amal amalan kebersihan yang baik)

- A Close Contact Daily Log form is created internally to record the close contact of the employee during the working hours. This form can be electronic.
- Basis of close contact is following the MOH definition.
- Daily recording by individual employee
- Once anyone in the company becoming Category 1 or 2, we need to retrieve the 14 days records of the individuals. After that, a risk assessment will be conducted.
- As cross infection can also happen from external and therefore if the employee has been in close contact with COVID-19 positive person or anyone in the Category 1, 2 or 3, the employee MUST report to the Management.

Individual Close Contact Daily Log



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COMPANY	
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3. Wear face mask, wash your hand often, and practise good hygiene
(Pakai topeng muka, basuh tangan dengan kerap dan amal amalan kebersihan yang baik)

List down your close contact for the day

Who are your close contact list?

1. < 1 meter and >15 mins

2. Same room > 2 hours

Record their names and where you meet them

Once anyone in the company becomes Category 1 or 2, we need to retrieve the 14 days records of the individuals. After that, a risk assessment will be conducted.

Example of completed Individual Close Contact Daily Log for the day

INDIVIDUAL CLOSE CONTACT DAILY LOG
(Log harian kontak rapat individu)

Note : Close Contact means having contact less than 1 meter

COMPANY	SSOM
STAFF NAME	KHAW
ID NUMBER	7193
DEPARTMENT	PD
DATE	09/02/2021

Location / Meeting point (Lokasi/ Tempat perjumpaan)	Contact person name (Nama orang yang ditemui/ berhubung)	Department / Company (Bahagian /Syarikat)
FOOD LAB	LIEW	PD
FOOD LAB	ONG	PD
FOOD LAB	NG	PD
SSLAB	DARUN	SSLAB
FOOD LAB	WAN	Flourmill

Staff Signature _____

Date 09/02/2021

NOTE

1. Record each individual that you meet/ working closely for a day
(Catit nama setiap individu yang berurusan/bekerja rapat dengan anda dalam sehari)
2. Please maintain 1 meter social distancing practices at all time
(Sila pastikan anda mengamalkan jarak sosial 1 meter pada setiap masa)
3. Wear face mask, wash your hand often, and practise good hygiene
(Pakai topeng muka, basuh tangan dengan kerap dan amal amalan kebersihan yang baik)

Soon Soon Close Contact Tracing and Risk Assessment Protocol

Category 1 (positive)		Category 2 (close contact with 1)			Category 3 (close contact with 2)			Category 4 (close contact with 3)		
Name	Work Area/ Dept	Name	Work Area/ Dept	Rationale of Inclusion	Name	Work Area/ Dept	Rationale of Inclusion	Name	Work Area/ Dept	Rationale of Inclusion
HOME QUARANTINE IF NO OR MILD SYMPTOMS	FOLLOW THE QUARANTINE INSTRUCTION BY MOH	HOME SURVEILLANCE 10 DAYS, DO RT-PCR TEST	Cat 2 +ve	MOVE TO CATEGORY 1	QUARANTINE AT HOME FOR 10 DAYS OR IF HAS TO WORK MUST BE LIMITED IN MOVEMENT WITH STRICT CLOSE CONTACT SOPs	Cat 2 +ve	MOVE TO CATEGORY 2	CONTINUE TO WORK	Cat 2 +ve	MOVE TO CATEGORY 3
QUARANTINE IN HOSPITAL OR QUARANTINE CENTRE IF INSTRUCTED BY MOH			Cat 2 -ve	CONTINUE HOME SURVEILLANCE TO COMPLETE 10 DAYS QUARANTINE		Cat 2 -ve	CONTINUE TO WORK		Cat 2 -ve	CONTINUE TO WORK

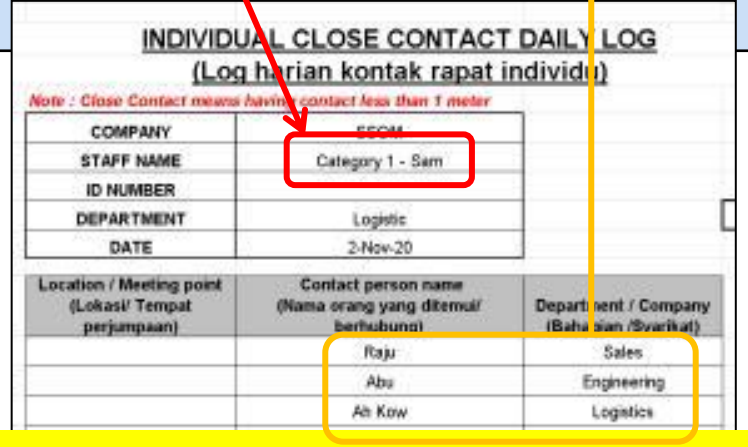
How do we complete the Contact Tracing and Risk Assessment Protocol

Category 1 (positive)		Category 2 (close contact with 1)			Category 3 (close contact with 2)			Category 4 (close contact with 3)		
Name	Work Area/ Dept	Name	Work Area/ Dept	Rationale Of inclusion	Name	Work Area/ Dept	Rationale Of inclusion	Name	Work Area/ Dept	Rationale Of inclusion
Sam	Logistic	Raju	Sales		Linda	Sales		Ali	Sales	
		Abu	Engineering		Fauzi	Procurement		Siti	Sales	
		Ah Kow	Logistics		Christina	IT		George	HR	

Close Contact list for the last 14 days

Close Contact list for the last 14 days

To continue tracing until Cat.4

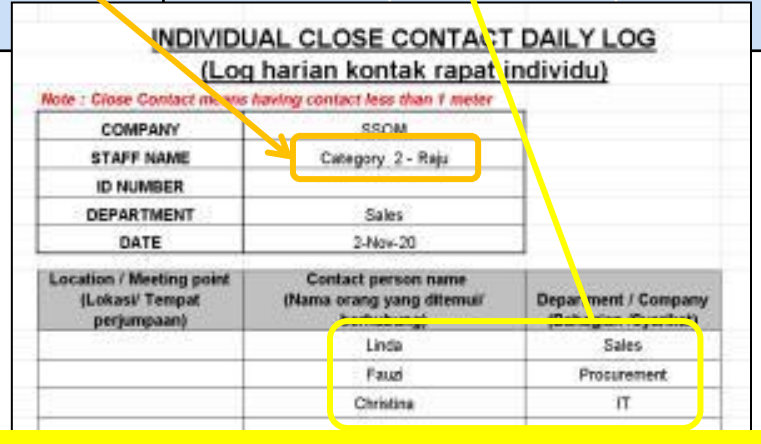


INDIVIDUAL CLOSE CONTACT DAILY LOG
(Log harian kontak rapat individu)

Note : Close Contact means having contact less than 1 meter

COMPANY	SSOM
STAFF NAME	Category 1 - Sam
ID NUMBER	
DEPARTMENT	Logistic
DATE	2-Nov-20

Location / Meeting point (Lokasi/ Tempat perjumpaan)	Contact person name (Nama orang yang ditemui/ berhubungi)	Department / Company (Bahagian /Syarikat)
	Raju	Sales
	Abu	Engineering
	Ah Kow	Logistics



INDIVIDUAL CLOSE CONTACT DAILY LOG
(Log harian kontak rapat individu)

Note : Close Contact means having contact less than 1 meter

COMPANY	SSOM
STAFF NAME	Category 2 - Raju
ID NUMBER	
DEPARTMENT	Sales
DATE	2-Nov-20

Location / Meeting point (Lokasi/ Tempat perjumpaan)	Contact person name (Nama orang yang ditemui/	Department / Company
	Linda	Sales
	Fauzi	Procurement
	Christina	IT

How do we complete the Contact Tracing and Risk Assessment Protocol

In the event **Raju has been tested positive**

Close contacts of Raju – Linda, Fauzi & Christina, will be **escalated to category 2**

Close contacts of Linda, Fauzi & Christina (Ali, Siti & George) will be **escalated to Category 3**

Category 1 (positive)		Category 2 (close contact with 1)			Category 3 (close contact with 2)			Category 4 (close contact with 3)		
Name	Work Area/ Dept	Name	Work Area/ Dept	Rationale Of inclusion	Name	Work Area/ Dept	Rationale Of inclusion	Name	Work Area/ Dept	Rationale Of inclusion
Sam	Logistic	Raju	Sales	Close Contact list for the last 14 days	Linda	Sales	Close Contact list for the last 14 days	Ali	Sales	
		Abu	Engineering		Fauzi	Procurement		Siti	Sales	
		Ah Kow	Logistics		Christina	IT		George	HR	

Category 1 (positive)		Category 2 (close contact with 1)			Category 3 (close contact with 2)			Category 4 (close contact with 3)		
Name	Work Area/ Dept	Name	Work Area/ Dept	Rationale Of inclusion	Name	Work Area/ Dept	Rationale Of inclusion	Name	Work Area/ Dept	Rationale Of inclusion
Sam	Logistic	Abu	Engineering		Ali	Sales		Lucy	Marketing	
Raju	Sales	Ah Kow	Logistics		Siti	Sales		Ah Meng	Finance	
		Linda	Sales		George	HR		Nanda	Production	
		Fauzi	Procurement							
		Christina	IT							

He will be **escalated to Category 1**

New tracing for close contact of Ali, Siti & George to be in Category 4

To continue tracing until Category 4

ACTUAL CASE: COVID 19 CLOSE CONTACT TRACING FOR OUR 1ST COVID-19 PATIENT

Affected date : 15/11/20 - 1/12/20 (Close contact tracing back 2 weeks from the tested date)

Category 1		Category 2			Category 3			Category 4		
1		8			19			65		
Name	Work area/dept	Name	Work area/dept	Rationale of inclusion	Name	Work area/dept	Rationale of inclusion	Name	Work area/dept	Rationale of inclusion
1-1 Tested on 1/12/2020 Positive on 4/12/2020	Logistic	2-1	Logistics	Working in same dept	3-1 3-2	Logistic	Often meet up due to working and meeting	4-1 4-2 4-3 3-17 3-8 4-4 4-5	wife daughter FIL Purchasing Accounts Accounts	meet up during working
		2-2	Logistics	Working in same dept	3-1 3-2	Logistic	Often meet up due to working and meeting	as above		
		2-3	Logistics	Working in same dept	3-3	GP bagging	Lunch together in small room	4-6 4-9 4-8		
					3-4	Flourmill	Prayer in surau	4-9 4-10 4-11 4-12 4-13 4-14		
					3- 5	SS Lab	Prayer in surau	4-15 4-16 4-17 4-18 4-19 4-20 4-21 4-22		
					3-6	SS Lab	Prayer in surau	4-23 4-3 4-8		
		2-4	Logistics	Working in same dept	3-3 3-1 3-2 3-8	GP bagging Logistic Logistic Purchasing	Lunch together in Often meet up due to working Discussion abt wo	as above as above as above 4-9 4-10	 Technical QC	

If all Category 2 positive, immediately all 92 persons have to be quarantined at home or semi-quarantined at office

Types of COVID-19 Tests

	RT-PCR	RTK-Antigen Test	Antibody Test
What it is	Test to show if a person has active infection NOW	Test to show if a person has active infection NOW	Test to show if a person has an infection in the past BUT it does not tell you whether you have active infection NOW
What it detects	Virus's genetic material	Specific protein from virus	Antibody in the person's immune system
How sample is taken	Nasal or throat swab	Nasal or throat swab	Blood test (finger prick or blood draw)
Time taken to get results	Same day – 1 week	15-30 min	Same day, or a few days
Accuracy and limitations	Typical high accuracy but likely to give false positive if use to test recovered COVID-19 patients	Usually high accuracy but false negative can occur especially for asymptomatic patients, need RT-PCR confirmation	Sometimes a second test is required for accurate results. Can be used for mass screening of exposure to COVID-19

RT-PCR = Reversed Trancription Polymerase Chain Reaction
RTK-Antigen Test = Rapid Test Kit Antigen Test

Adopted from US FDA

How to use RT-PCR and RTK-Ag tests to mitigate the spread of COVID-19 in your workplace

- All Category 2 people should be tested using RT-PCR since RTK-Ag test may not be sensitive enough for asymptomatic patients.

- This is the most important testing you need to do and is the core of the risk mitigation program. Any Category 2 person that is tested positive, will require all Category 3 people in close contact to be tested and quarantined, etc.

- MOH does not now require any testing for any recovered COVID-19 patients after 10 days. Do not test for RT-PCR as it is likely to be positive due to viral debris although the patient is not infectious.

- RTK-Ag testing is useful if you detect a staff with COVID-19 symptoms and therefore requires immediate status confirmation, so that you can isolate all the close contact of this person. However, you need to reconfirm with a RT-PCR test.

MOH SOPs
“Follow 3W and Avoid 3C”

FOLLOW 3W






WASH **WEAR** **WARN**

MOH SOPs
“Follow 3W and Avoid 3C”

AVOID 3C

CROWDED PLACE

CONFINED SPACES

CLOSE CONVERSATION

Examples of our mitigation program

Follow 3W, Avoid 3C – Temperature scan, Health Declaration, Signage, Hand sanitiser at entrance

Sanitiser at entrance

Signage at Visitor registration

My Sejahtera Check-in

OR

Manual registration

Top Left: Forehead Temperature scan for staff and/or visitor

Bottom left: Health declaration at the entrance

Left: Physical marking on floor for staff and visitor waiting for turn to check in and temperature scanning

Examples of our mitigation program

Follow 3W, Avoid 3C – Forehead temperature

Temperature <37.5°C

Can enter

Temperature ≥37.5°C

Entry denied

Get medical consultation

Confirm fever and subject to doctor's diagnosis

Stay at home

Test for antigen/ PCR

Examples of our mitigation program

Follow 3W, Avoid 3C – Face Mask

- Mandatory requirement to wear face mask in company premises
- Company provide face mask for the staff FOC

Examples of our mitigation program

Follow 3W, Avoid 3C – Office: Paradigm shift to implement new norms at work: minimizing physical contact

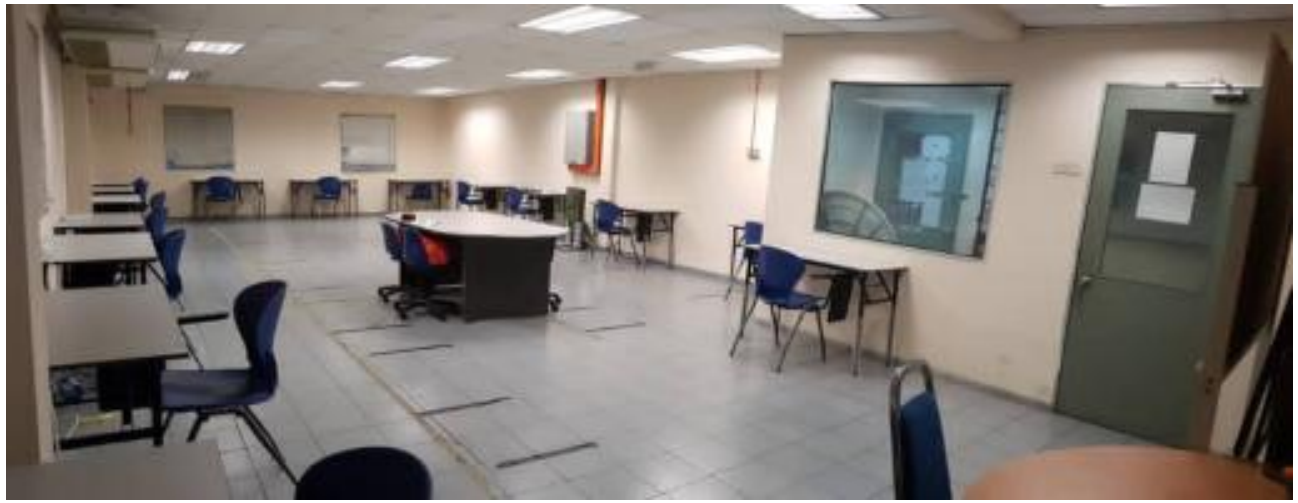
Desk partitions using perspex or cardboard

Alternate sitting and limiting number of person per room

Virtual Meeting

Examples of our mitigation program

Follow 3W, Avoid 3C – Converting large rooms into partitioned offices to improve social distancing and to minimise number of people in an enclosed room

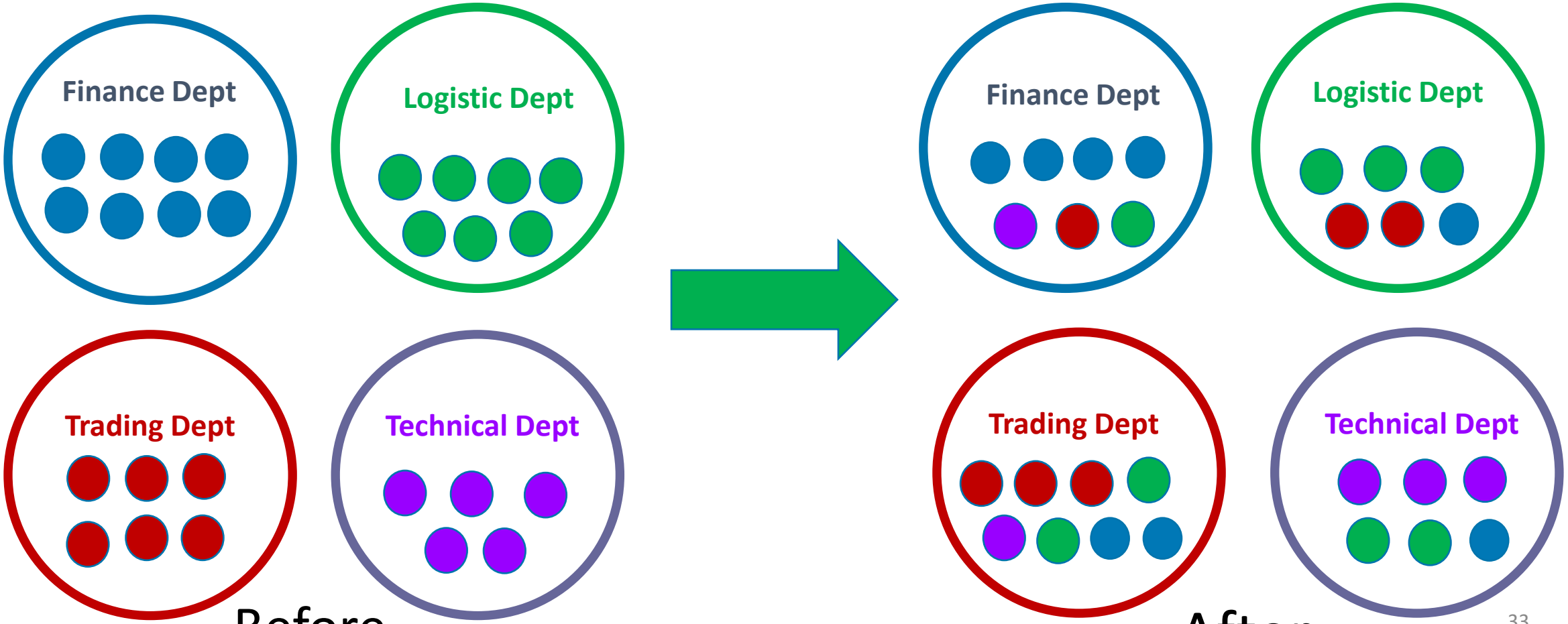


Eg: Before: Training Room

After: Partitioned offices

Examples of our mitigation program

Follow 3W, Avoid 3C – Relocating staff from one department into other departments to avoid total shutdown of any department



Examples of our mitigation program

Follow 3W, Avoid 3C – Immediate closure of our canteen eating area & allow only take away, Limiting number of person in canteen at one time and not for more then 15 min

Traffic Flow

Entrance

Queue with 1 metre apart

Closure of eating area

Limiting number of person at one time in the canteen

Exit

Examples of our mitigation program

Follow 3W, Avoid 3C – Scheduled canteen visiting hours for different departments

CANTEEN SCHEDULE TO BUY FOOD & DRINK

	Time	Flourmill	Feedmills	OM						SOF			Office
				W/house	MPGP/ GP Bagging	Mealy Silo / Silo / PH1	Sona 1 /QC	Press Plant	Maint / Technical	C. Refinery	BP / TP / BP Whouse	Hydro B.Ref./ QC/ Maint / PH2	
Morning Tea-Break	09:15 - 09:25	●											
	09:25 - 09:40		●	●									
	09:40 - 09:50				●	●							
	09:50 - 10:00						●	●					
	10:00 - 10:10								●				
	10:10 - 10:20									●	●	●	
	10:20 - 10:30												●
Lunch	11:30 - 11:45	●											
	11:45 - 12:15		●	●									
	12:15 - 12:30				●	●							
	12:30 - 12:45						●	●					
	12:45 - 13:00								●				
	13:00 - 13:15									●	●	●	
	13:15 - 13:30												●
Afternoon Tea-Break	14:15 - 14:25	●											
	14:25 - 14:40		●	●									
	14:40 - 14:50				●	●							
	14:50 - 15:00						●	●					
	15:00 - 15:10								●				
	15:10 - 15:20									●	●	●	
	15:20 - 15:30												●

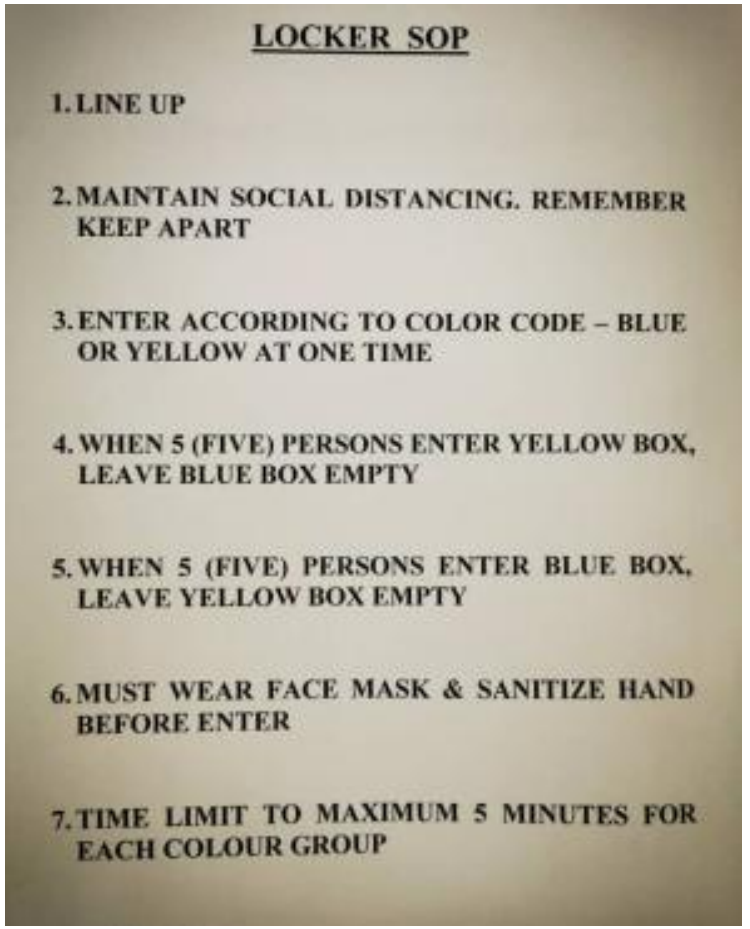
Dated : 12.10.2020

Examples of our mitigation program

Follow 3W, Avoid 3C – Workers' lockers and traffic flow

Sanitiser at entrance of locker area

Locker area traffic flow



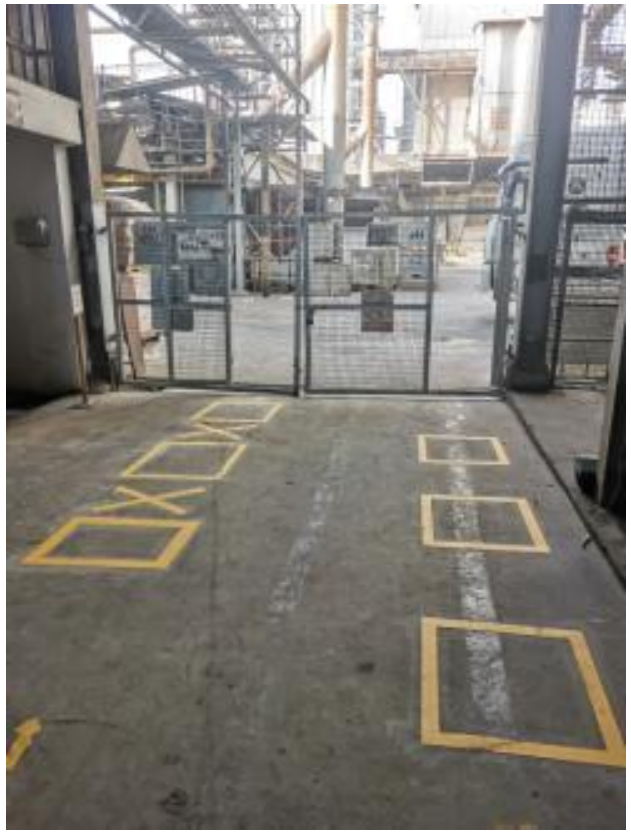
LOCKER SOP

1. LINE UP
2. MAINTAIN SOCIAL DISTANCING. REMEMBER KEEP APART
3. ENTER ACCORDING TO COLOR CODE – BLUE OR YELLOW AT ONE TIME
4. WHEN 5 (FIVE) PERSONS ENTER YELLOW BOX, LEAVE BLUE BOX EMPTY
5. WHEN 5 (FIVE) PERSONS ENTER BLUE BOX, LEAVE YELLOW BOX EMPTY
6. MUST WEAR FACE MASK & SANITIZE HAND BEFORE ENTER
7. TIME LIMIT TO MAXIMUM 5 MINUTES FOR EACH COLOUR GROUP

SOP

Examples of our mitigation program

Follow 3W, Avoid 3C – Production area



Shift handover location and time limit: 15 min maximum

Sitting position 1 m apart
or use perspex partition

Examples of our mitigation program

Follow 3W, Avoid 3C – Surau

Hand sanitiser at the entrance

- Social distancing at surau with a 1m demarcation line.
- Limiting number of person at one time, depending on size of the room, with face mask and not more than 15 min.
- Disinfectant Virkon S and additional Hand sanitiser placed in the surau. Daily working day disinfection activities recorded.

Examples of our mitigation program

- Follow 3W, Avoid 3C – Disinfection activities

Daily Disinfection activities using Virkon-S at common areas:

- Offices
- Canteen
- Guard Post
- Surau
- Meeting Room
- Toilet
- Foreign workers' dormitories

Misting on periodic: 3 times a week

Virkon®S is a multipurpose virucidal disinfectant with ability to kill 99.9999% of numerous pathogens including 58 types of viruses. Prepared fresh and keep maximum 7 days. Clorox can also be used as a substitute for Virkon® S.

Examples of our mitigation program

Follow 3W, Avoid 3C – Workers bus: Disinfection and alternate sitting arrangement and travelling for less than 20 min without air-conditioning

Regular inspection by HR to ensure sanitization and bus sitting arrangement as per our protocols

Examples of our mitigation program

Follow 3W, Avoid 3C – Foreign workers dormitories –

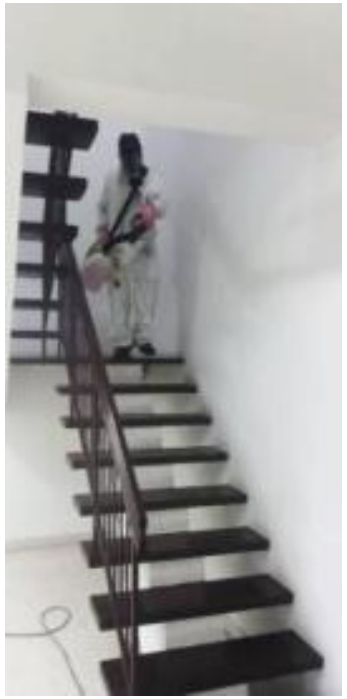
Act 446 (Amendment) 2019 on Workers' Minimum Standards of Housing and Amenities)

By virtue of the Act, companies are responsible for their workers dormitories, complying to Act 446 (Amendment) 2019 such as:

- Accommodation conditions
- Minimum standard accommodation
- Management of the accommodation to ensure conformance of the requirements

Basic amenities such as kitchen equipped with stove, sink , storage cabinets, eating table, fridge etc

Notice Board updating the latest requirements



Daily Self Disinfection and misting 3 times week (Top and left)

Bed 1m apart

Examples of our mitigation program

Contingency Plan – Quarantine Center

Quarantine Center

Left, Notice Board Updating SOPs and Memos

Bedroom

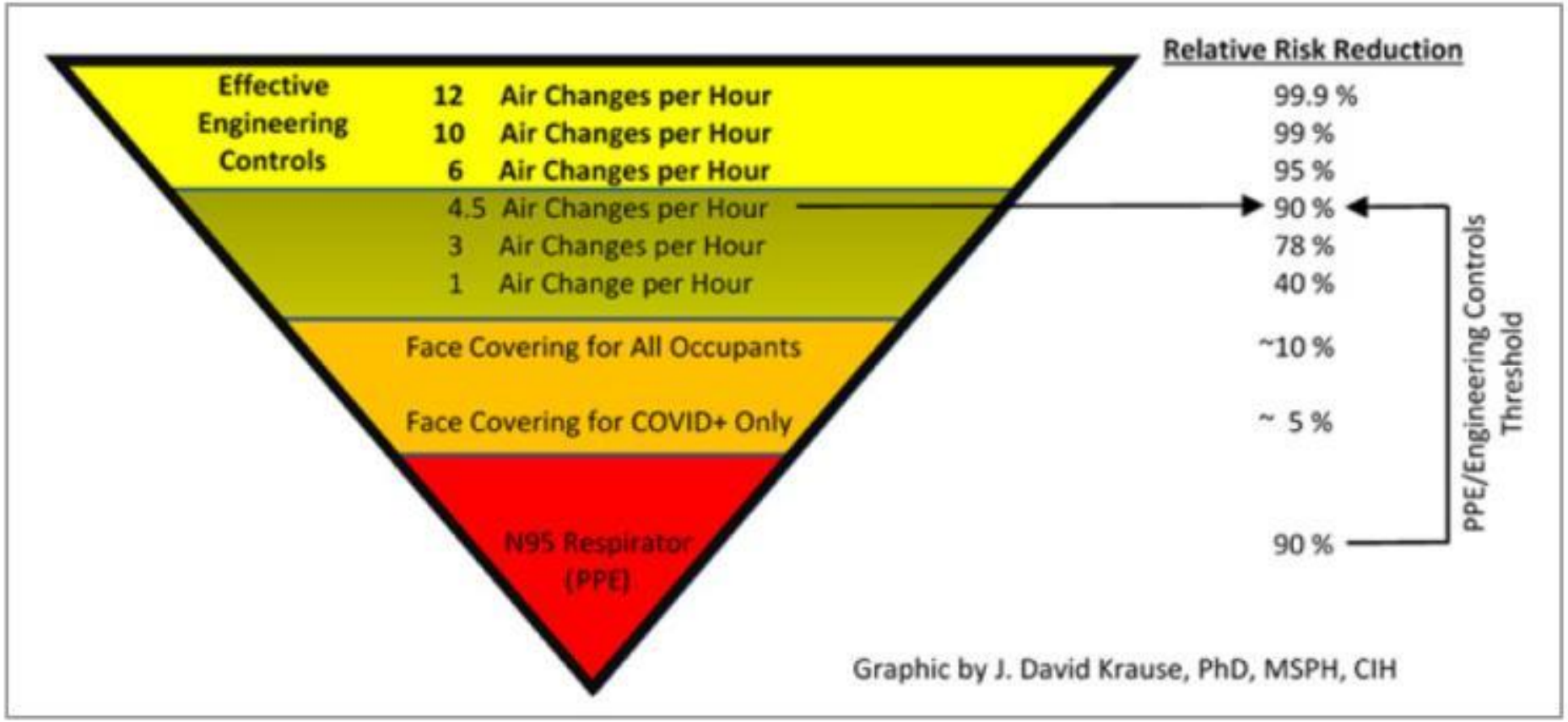
Cozy Living Area

Examples of our mitigation program
Managing the air-conditioning system
1. Managing Airflow

- Normal centralized air-conditioned will have fresh air intake between 10-20% of the total airflow
- Therefore, total fresh airflow change is between 1-3times per hour
- The relative risk reduction of virus transmission will be reduced by 40%-78%
- To achieve a 90% risk reduction, you will require 4.5times fresh air change per hour. This is difficult for most workplaces and factories as there will be insufficient cooling and/or airflow.
- Treating the return air in the air-conditioning system using UVC Light and plasmacluster ioniser can reduce the viral load by more than 99%.
- This will enable the air change of viral free air to go up to more than 10 times per hour.

Examples of our mitigation program
Managing the air-conditioning system

Managing airflow at least 4.5 air changes per hour reduces virus transmission by 90%



Source: American Industrial Hygiene Association (AIHA) Guidance Document on Reducing the Risk of COVID-19 using Engineering Control, Version 4, 4 September, 2020.

Examples of our mitigation program
Managing the air-conditioning system

Eg. In our office centralized air-conditioning system

- Air conditioner (fresh air + recycle air) flow rate, Q_1 = 10,000 ft^3/min
- Ventilation air (fresh air) flow rate, Q_2 = 1,700 ft^3/min
- Air change per hour $ACH = \frac{60Q}{Vol}$
- % Ventilation/ Fresh Air $= \frac{1{,}700}{10{,}000} \times 100 = 17\%$

Office Floor	Space Volume (Vol), ft^3	Ventilation / Fresh Air ACH	Air Conditioner ACH
GF	41,671	17% X 60 X 10,000/ 41,671 = **2.4**	60 X 10,000/ 41,671 = **14.4**
1F	50,605	17% X 60 X 10,000/ 50,605 = **2.0**	60 X 10,000/ 50,605 = **11.8**
2F	48,487	17% X 60 X 10,000/ 48,487 = **2.1**	60 X 10,000/ 48,487 = **12.4**

Examples of our mitigation program
Managing the air-conditioning system

2. Improving air changes per hour by using Plasmacluster Ionization and UVC Light

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Air ionisation reduces virus in independent test

Updated / Tuesday, 16 Jun 2020 09:08

There is mounting research to suggest that clean, disinfected air plays a vital role in preventing the spread of the virus causing Covid-19

SCIENTIFIC REPORTS

nature research

Check for updates

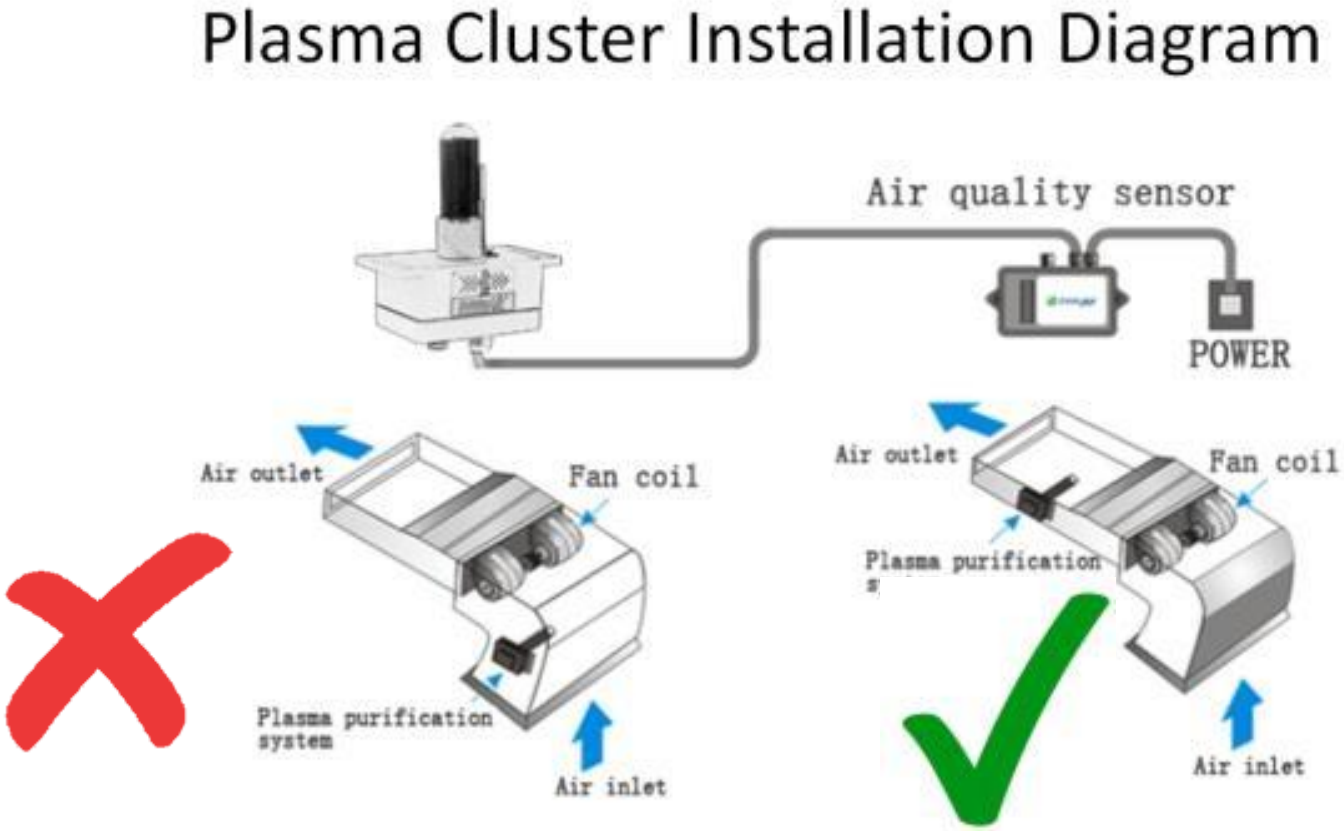
Far-UVC light (222 nm) efficiently and safely inactivates airborne human coronaviruses

Manuela Buonanno, David Welch, Igor Shuryak & David J. Brenner ✉

A direct approach to limit airborne viral transmissions is to inactivate them within a short time of their production. Germicidal ultraviolet light, typically at 254 nm, is effective in this context but, used directly, can be a health hazard to skin and eyes. By contrast, far-UVC light (207–222 nm) efficiently kills pathogens potentially without harm to exposed human tissues. We previously demonstrated that 222-nm far-UVC light efficiently kills airborne influenza virus and we extend those studies to explore far-UVC efficacy against airborne human coronaviruses alpha HCoV-229E and beta HCoV-OC43. Low doses of 1.7 and 1.2 mJ/cm² inactivated 99.9% of aerosolized coronavirus 229E and OC43, respectively. As all human coronaviruses have similar genomic sizes, far-UVC light would be expected to show similar inactivation efficiency against other human coronaviruses including SARS-CoV-2. Based on

Examples of our mitigation program
Managing the air-conditioning system

Using Plasmacluster Ionization to reduce viral load



Location to install plasmacluster is at cool air outlet

Examples of our mitigation program
Managing the air-conditioning system

Using Plasmacluster ionization to reduce viral load

Split unit air conditioner plasmacluster installed location

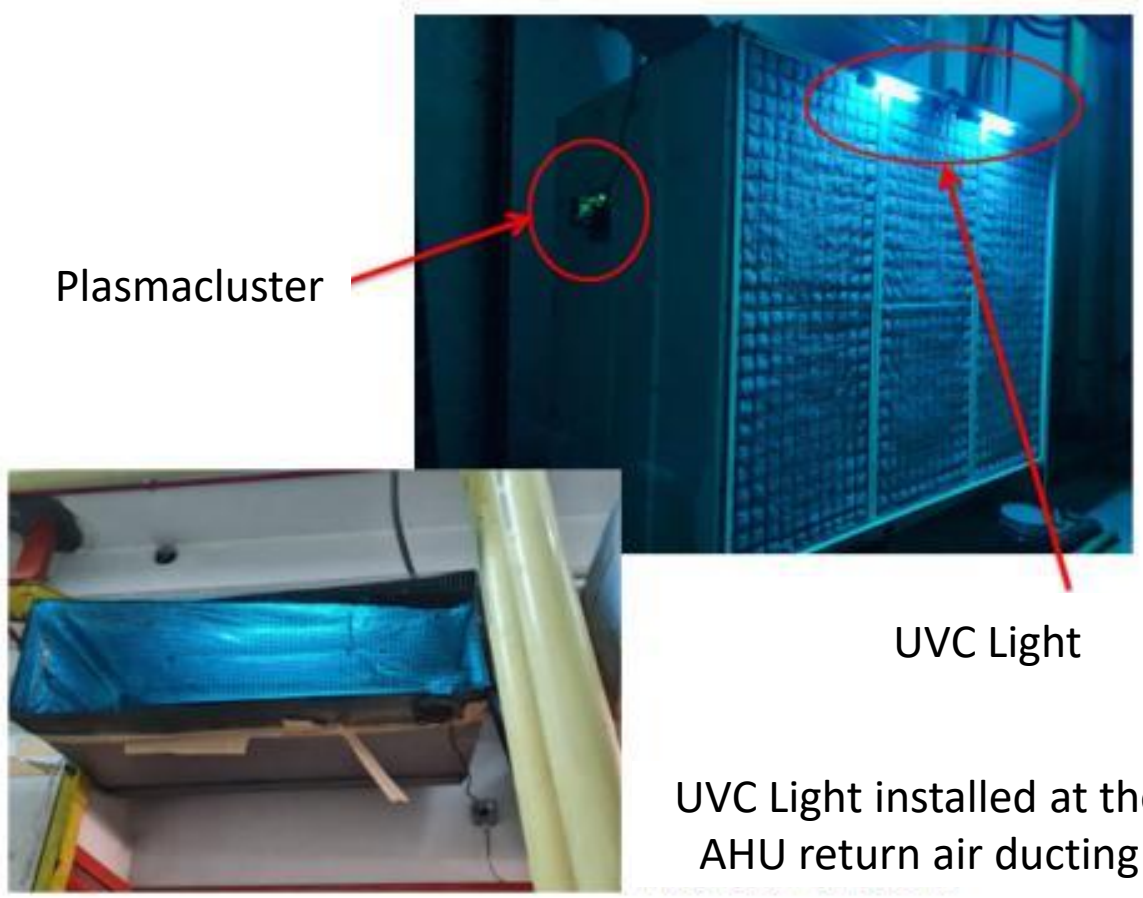
Portable plasmacluster for small office room

Centralized air condition plasmacluster installed location

Examples of our mitigation program
Managing the air-conditioning system

Using UVC Light to reduce viral load in the air-conditioning system

Warning light outside room indicating UVC Light is ON inside AHU Room



UVC Light installed at the AHU return air ducting

Examples of our mitigation program

Continuous education and creating awareness

Internal Covid-19 website

Posters

Take Home Messages

1. You cannot prevent COVID-19 patient from entering your workplace as 80% of COVID-19 patient are asymptomatic or have mild symptoms.
2. You have to assume every staff is a potential COVID-19 spreader.
3. You need a strong high level task force to deal with constant changes in regulations and situations
4. You must set up a daily contact tracing for every staff and have a 4 level contact tracing and risk assessment protocol.
5. Your mitigation program must be robust enough to prevent the spread of COVID-19 in your workplace, follow MOH protocol and more.

Potential emerging issues

1. Vaccination and type of vaccination
2. Vaccination for young people will probably take place at the end of this year or early next year. Don’t hope for vaccination to solve the problem soon.
3. New variants which are more infectious, eg, UK and S. African
3. Private hospitals involvement in COVID-19 treatment
4. Medical insurance for COVID-19 patients

Thank you