



Preventif dan Pengendalian Infeksi



dalam
Masa Pandemi

Wira Widjaya L, dr, MKedKlin, SpMK

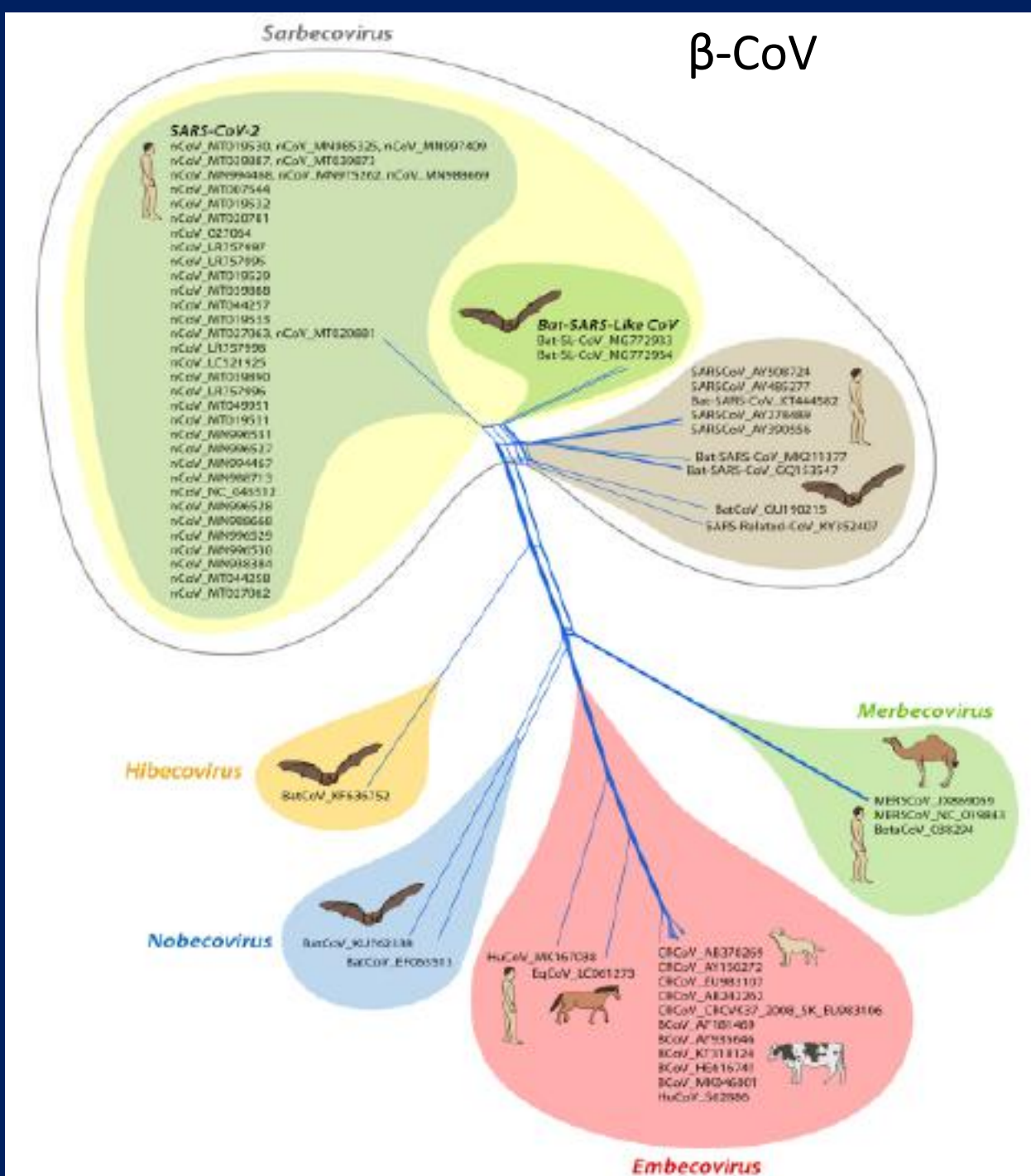
**Dosen Mikrobiologi-Fakultas Kedokteran
Universitas Ciputra Surabaya**

INTRODUCTION

- 1960 : Virus Corona pertama kali diisolasi
- 2003 : kasus pneumonia akibat SARS-CoV dari China
- 2012 : kasus pneumonia akibat MERS-CoV di Arab Saudi
- 2019 : wabah pneumonia akibat virus Corona baru (nCoV19)
- 30 Januari 2020 : WHO menyatakan sebagai kegawatan dalam bidang Kesehatan Publik
- 11 Februari : COVID-19 akibat SARS-CoV 2
- 11 Maret 2020 : COVID-19 berstatus pandemic global (WHO)

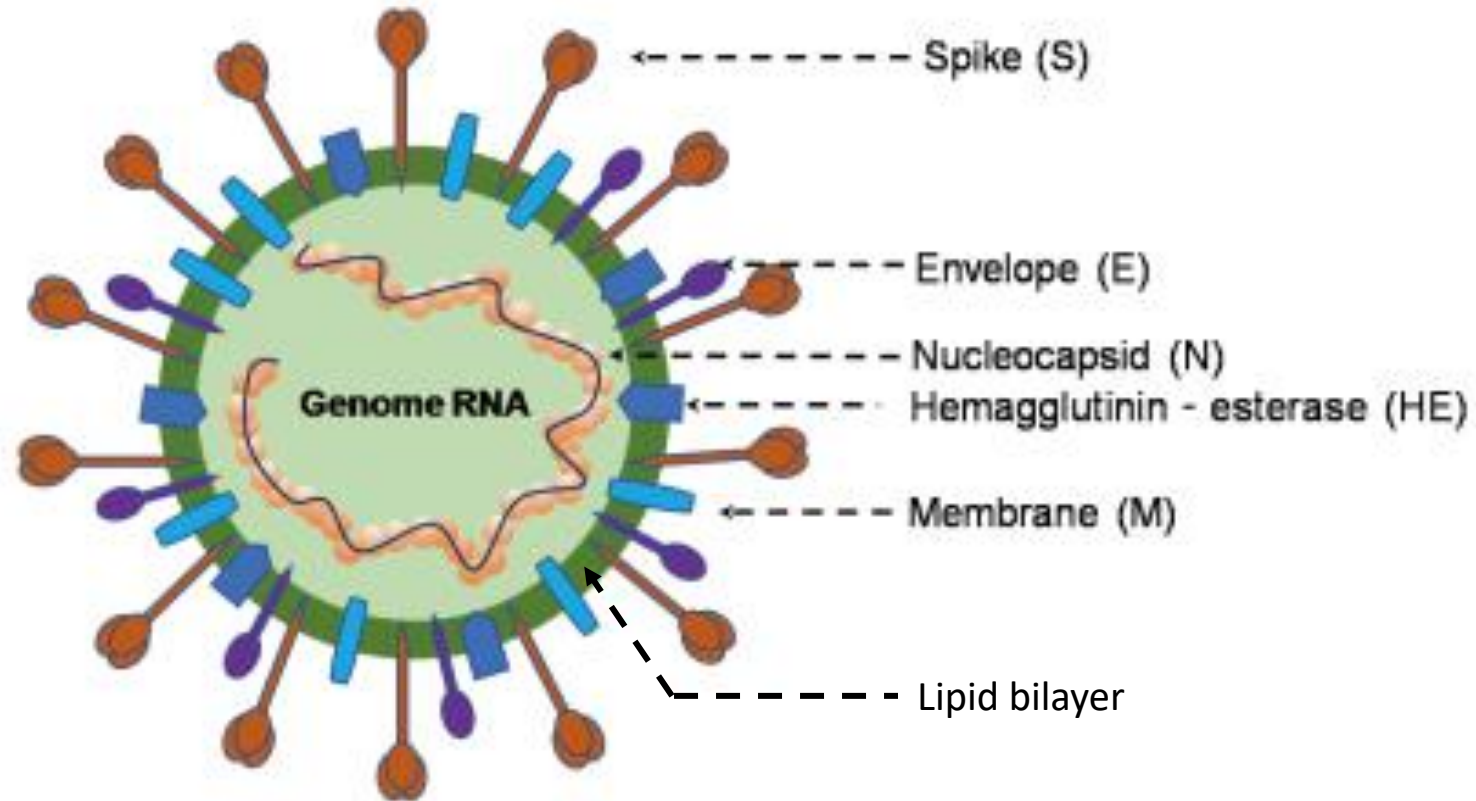
VIROLOGI SARS-COV 2

- Family : Coronaviridae
- Subfamily : Orthocoronavirinae
- Genus : α , β , δ dan γ -coronavirus

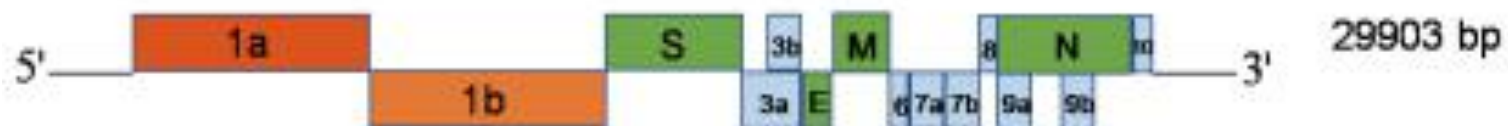











Struktur Virus SARS-CoV-2

Ukuran partikel SARS-CoV-2 = 120-160 nm



Gen-gen identifikasi SARS-CoV-2



Name	Cases - cumulative total	⇌	Cases - newly reported in last 24 hours	Deaths - cumulative total	Deaths - newly reported in last 24 hours	Transmission Classification
Global	103,362,039		403,263	2,244,713	12,120	
 Indonesia	1,099,687 ↓		10,379	30,581	304	Community transmission
 Philippines	528,853 ↓		1,581	10,674	67	Community transmission
 Malaysia	222,628 ↓		3,455	791	21	Clusters of cases
 Singapore	59,584		19	29	0	Sporadic cases
 Thailand	21,249		795	79	0	Clusters of cases
 Viet Nam	1,891		40	35	0	Clusters of cases
 Cambodia	466		0	0	0	Sporadic cases
 Brunei Darussalam	180		0	3	0	Sporadic cases
 Lao People's De...	44		0	0	0	Sporadic cases

Sumber : covid19.who.int (03 Feb 2021)

1,111,671

TERKONFIRMASI
+11,984 Kasus

175,236

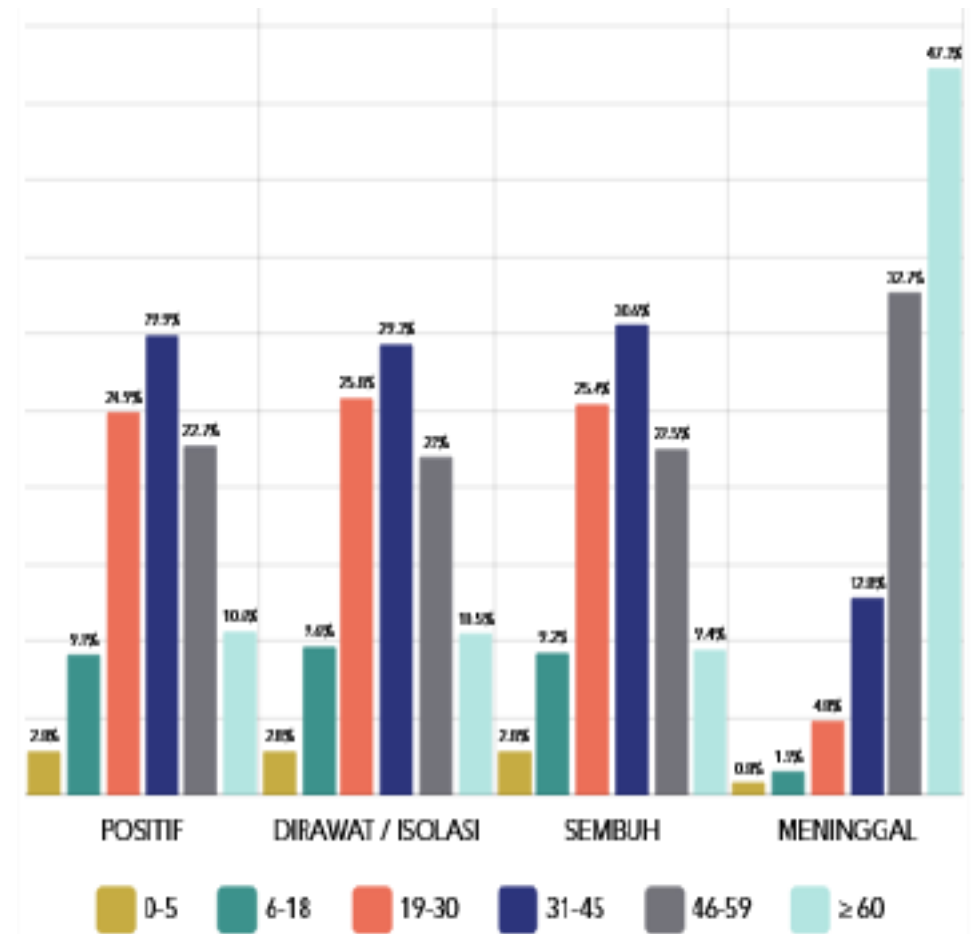
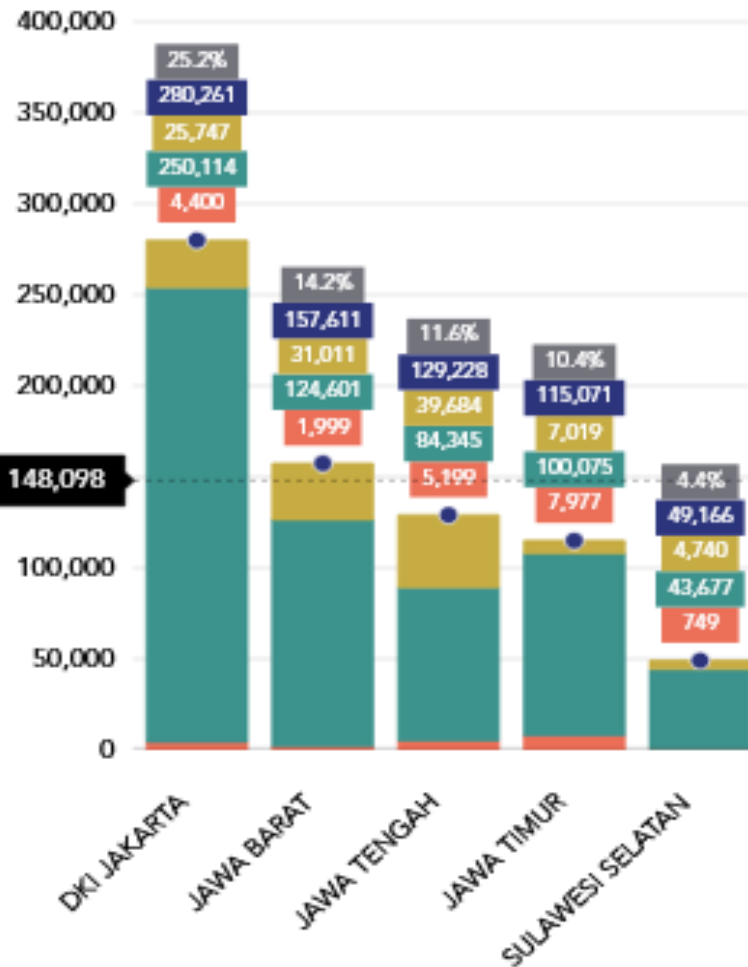
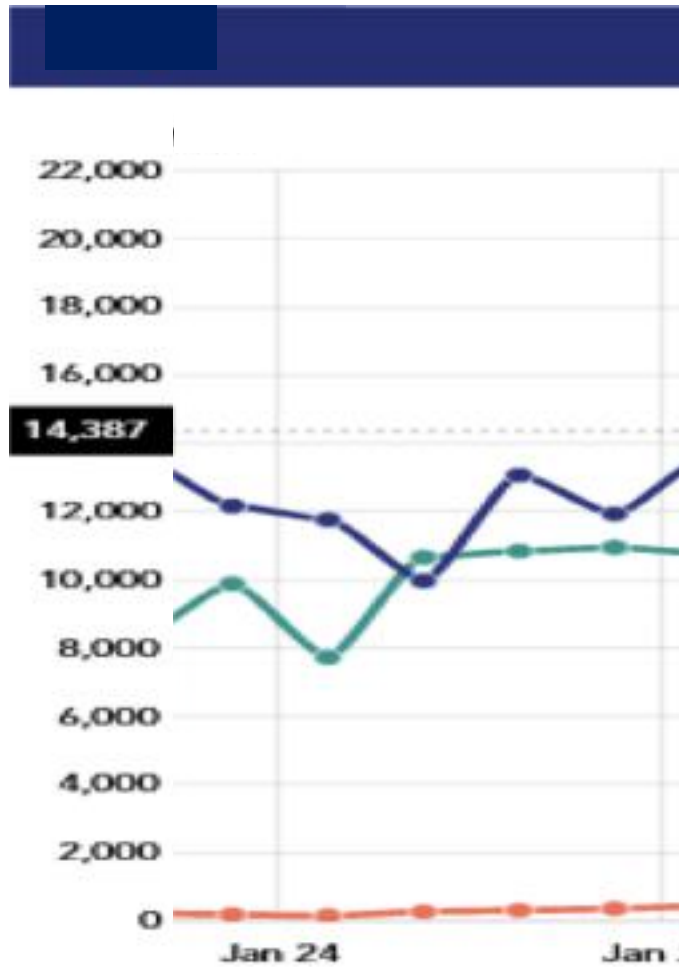
KASUS AKTIF
15.8% dari Terkonfirmasi

905,665

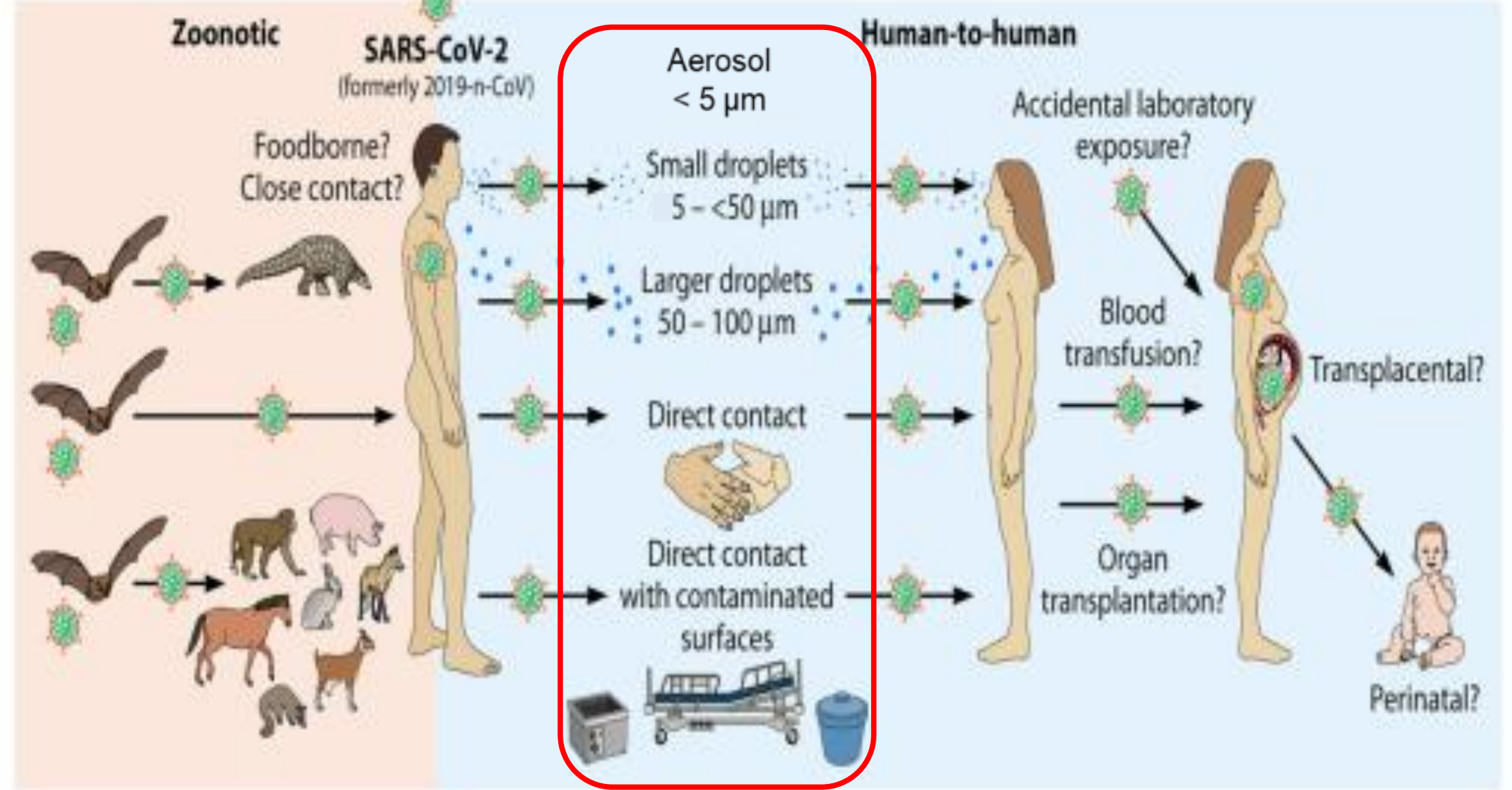
SEMBUH
81.5% dari Terkonfirmasi

30,770

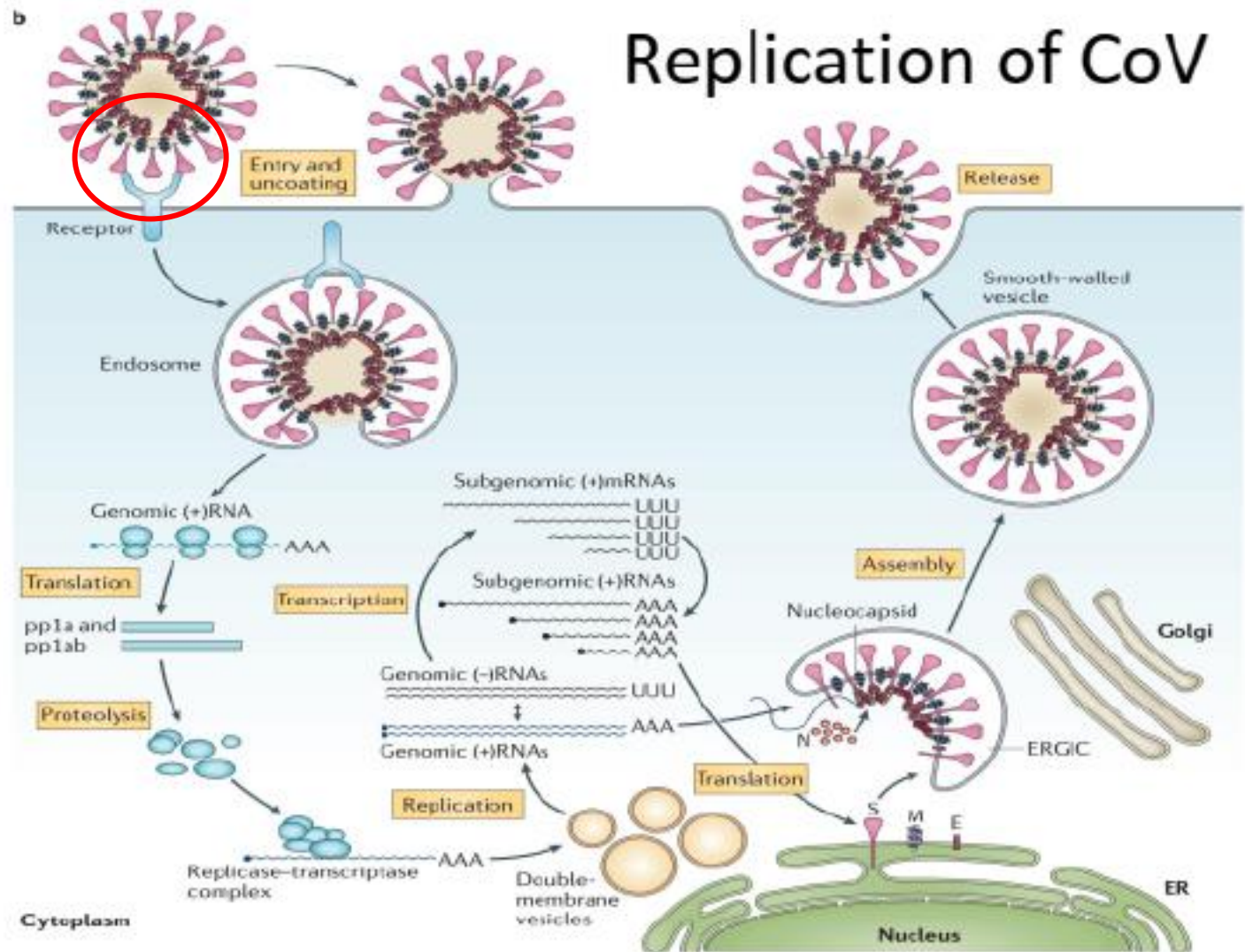
MENINGGAL
2.8% dari Terkonfirmasi



METODE TRANSMISI SARS-COV-2 HUMAN TO HUMAN



PATOGENESIS COVID-19



De Wit, et al, Nature Reviews Microbiology, 2016

Reseptor : ACE-2



Dijumpai di epitel:

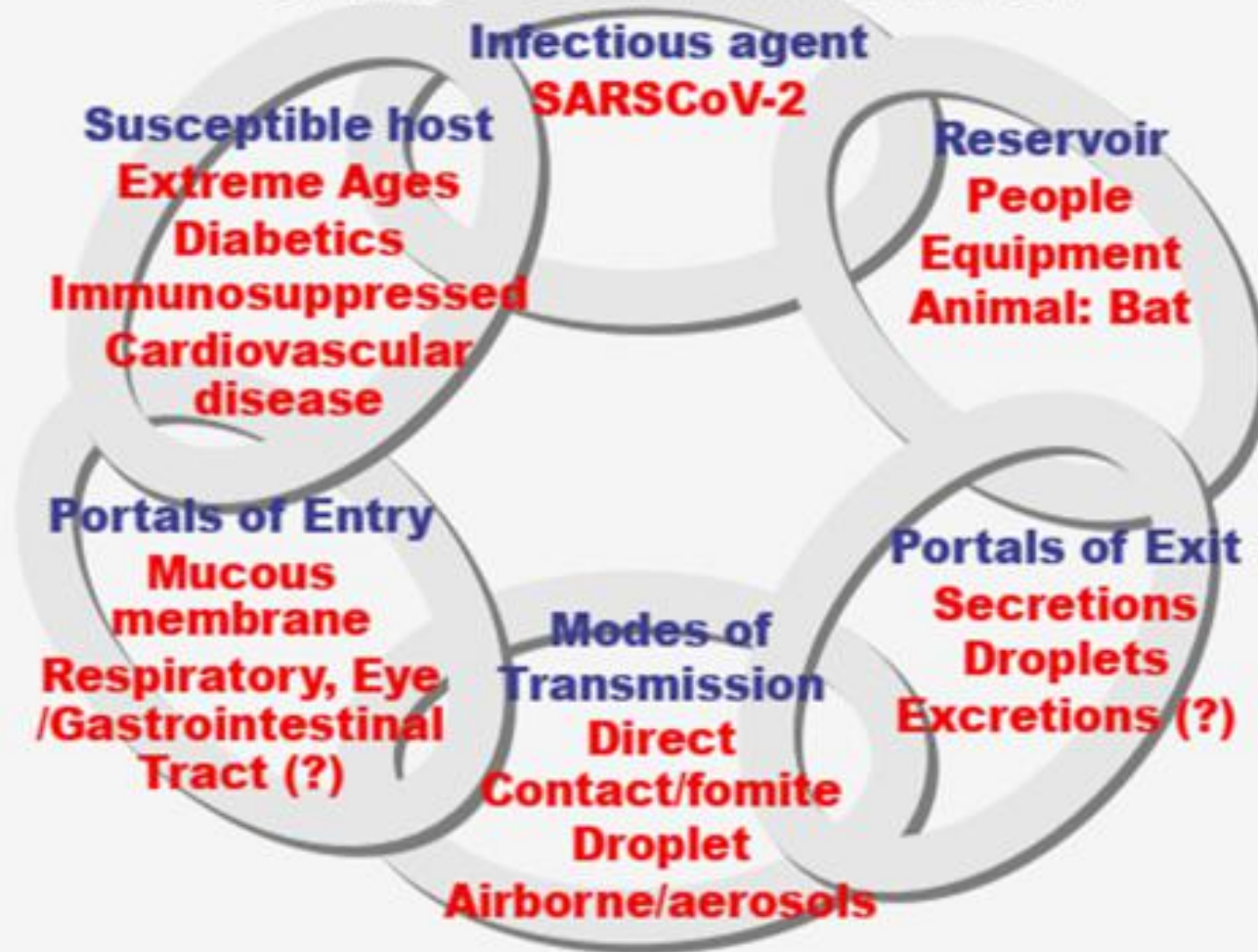
- Mukosa hidung, mulut, nasofaring dan nasolaring
- Pembuluh darah
- **Alveolar paru-paru (>>>>)**
- **Otot jantung**
- **Usus**
- **Ginjal**
- **Kandung kemih**

GEJALA COVID-19



Dapat muncul dalam **2-14** hari setelah terpapar SARS-CoV-2

The Six Component Chain of SARS-Cov-2 Infection



Know your enemy and know yourself and you can fight a hundred battles without disaster

-Sun Tsu-

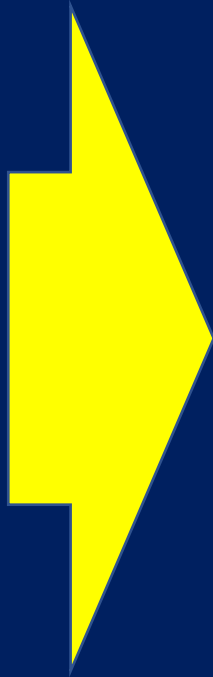
Manajemen Covid-19

- Terapi → mekanisme patofisiologi belum jelas
- Imunisasi → dalam proses pengembangan (akhir 2020 ???)
- Pencegahan transmisi :
 1. Masker
 2. Hand hygiene
 3. Physical distancing & social distancing
 4. Environment hygiene and sanitation
 5. Ventilasi udara dalam ruangan

Pencegahan transmisi

3 M

- Menggunakan masker
- Mencuci tangan
- Menjaga jarak



5 M

- Menggunakan masker
- Mencuci tangan
- Menjaga jarak
- Menghindari kerumunan
- Menjaga imunitas

Identifying airborne transmission as the dominant route for the spread of COVID-19

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KENAPA HARUS MASKER ???

pandemic, including widely adopted social distancing and mandated face covering. However, assessing the effectiveness of those intervention practices hinges

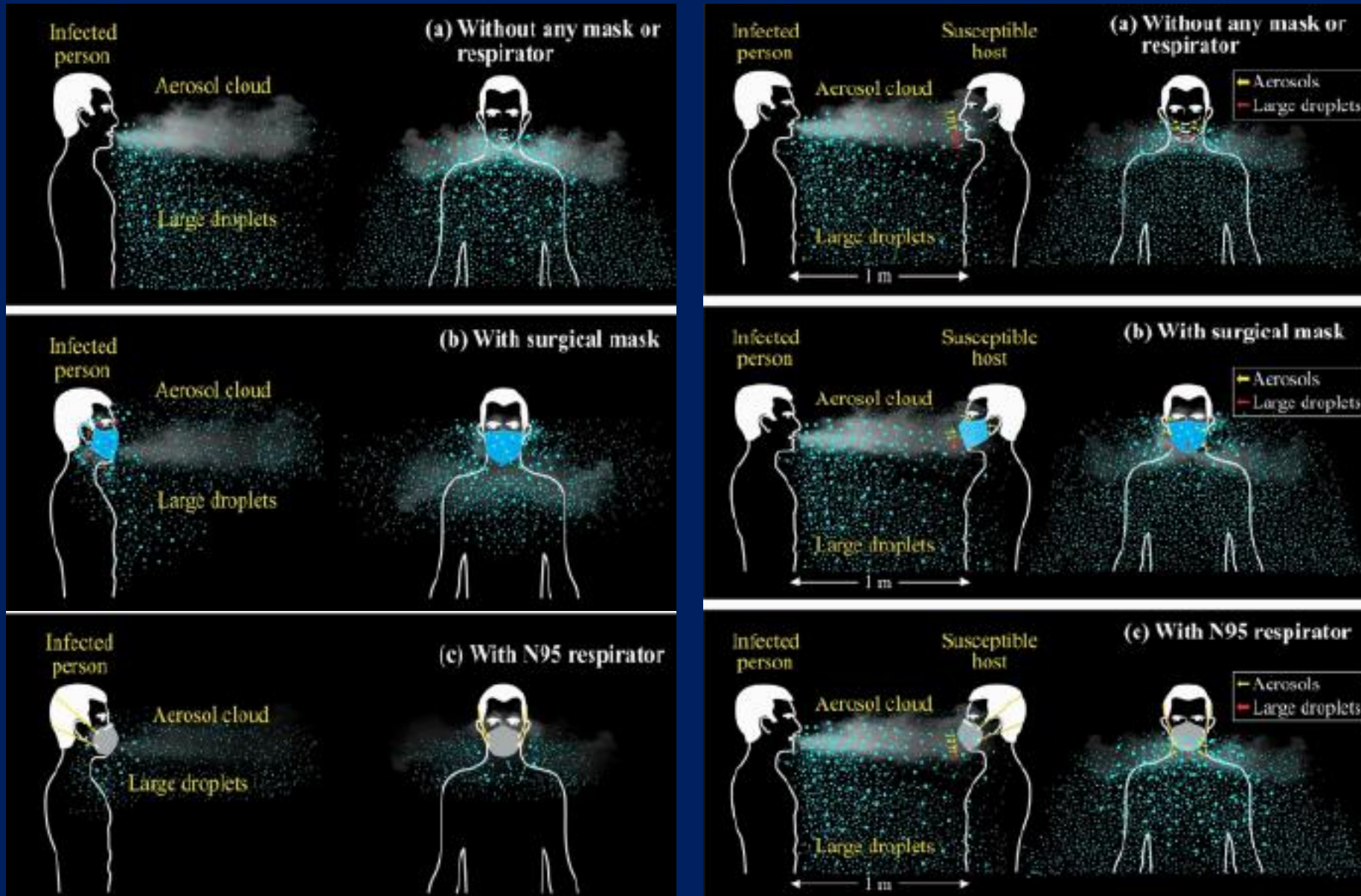
on the understanding of virus transmission, which remains uncertain. Here we show that **airborne transmission is highly virulent and represents the dominant route to spread the disease**. By analyzing the trend and mitigation measures in Wuhan, China, Italy, and New

York City, from January 23 to May 9, 2020, we illustrate that the impacts of mitigation measures are discernable from the trends of the pandemic. Our analysis reveals that the difference with and without mandated face covering represents the determinant in

shaping the pandemic trends in the three epicenters. This protective measure alone significantly reduced the number of infections, that is, by over 78,000 in Italy from April 6 to May 9 and over 66,000 in New York City from April 17 to May 9. Other mitigation measures, such as **social distancing**

implemented in the United States, are insufficient by themselves in protecting the public. We conclude that **wearing of face masks in public corresponds to the most effective means to prevent interhuman transmission**, and this inexpensive practice, in conjunction with **simultaneous social distancing, quarantine, and contact tracing**, represents the most likely fighting opportunity to stop the COVID-19 pandemic. Our work also highlights the fact that sound science is essential in decision-making for the current and future public health pandemics

Skema Efektivitas Masker dalam Pencegahan Covid-19



Syarat Masker Kain

- BSN (2020): SNI 89104:2020 Tekstil-masker dari kain
- 3 tipe masker : tipe A (penggunaan umum)
 - tipe B (penggunaan filtrasi bakteri)
 - tipe C (penggunaan filtrasi partikel)
- Efisiensi filtrasi tergantung kerapatan kain, jenis serat dan anyaman → filtrasi 0,7%-60% (tergantung jumlah lapisan)
- Masker berbahan kain tenun/rajutan terdiri minimal 2 lapis
- Tidak dipakai lebih dari 4 jam
- Keuntungan : reuseable

ETIKA Batuk & Bersin



1 Tutupi Mulut & Hidung

Gunakan tisu atau siku bagian dalam, jangan tutupi dengan telapak tangan



2 Bersihkan Kontaminasi

Buang tisu dan bersihkan benda yang tercemar percikan bersin atau batuk



3 Cuci Tangan

Lebih sering cuci tangan dengan sabun dan air mengalir selama minimal 20 detik.



4 Jangan Sentuh Wajah

Tangan dapat membawa virus dan masuk melalui mata, hidung, dan mulut



Psychochemical properties SARS-CoV-2

Inactivated by :

> UV light

> Heated at 56°C 30 min

> Disinfectants :

- Diethyl ether
- Ethanol 75%
- Peracetic acid
- Chloroform

Stable on :

* Plastic

* Stainless steel

* Dry or wet condition or acidic environment

KENAPA CUCI TANGAN ???

CUCI TANGAN

- SARS-CoV-2 mudah hancur oleh **sabun dan bahan antiseptik**
- Cuci tangan menggunakan **sabun dan air mengalir** selama **40-60 detik**
- Cuci tangan menggunakan **hand sanitizer** selama **20-30 detik**
- Kapan **HARUS** cuci tangan ? → **SESERING MUNGKIN**
 - > Sebelum dan sesudah menyentuh sesuatu
 - > Sebelum dan sesudah menyentuh wajah
 - > Sesudah menutup mulut/ hidung saat batuk / bersin
- Kapan **HARUS** menggunakan sabun & air mengalir ?
 - Bila tangan terlihat kotor atau terasa lengket
 - Sesudah 10x mencuci tangan menggunakan hand sanitizer

How to Handwash?

WASH HANDS WHEN VISIBLY SOILED! OTHERWISE, USE HANDRUB

🕒 Duration of the handwash (steps 2-7): 15-20 seconds

🕒 Duration of the **entire procedure: 40-60 seconds**



How to Handrub?

RUB HANDS FOR HAND HYGIENE! WASH HANDS WHEN VISIBLY SOILED

🕒 Duration of the **entire procedure: 20-30 seconds**



World Health Organization

Patient Safety

A World Mission for Safer Health Care

SAVE LIVES

Clean Your Hands



World Health Organization

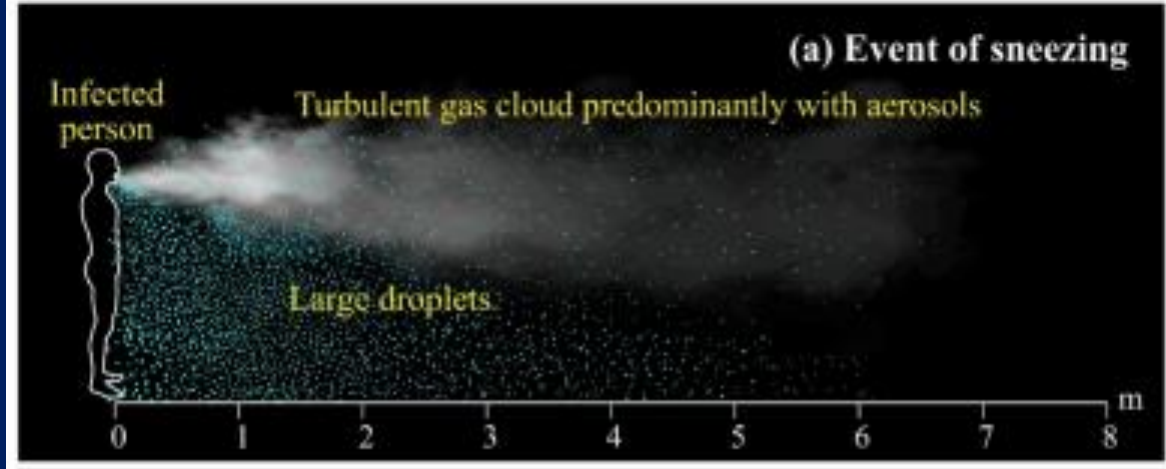
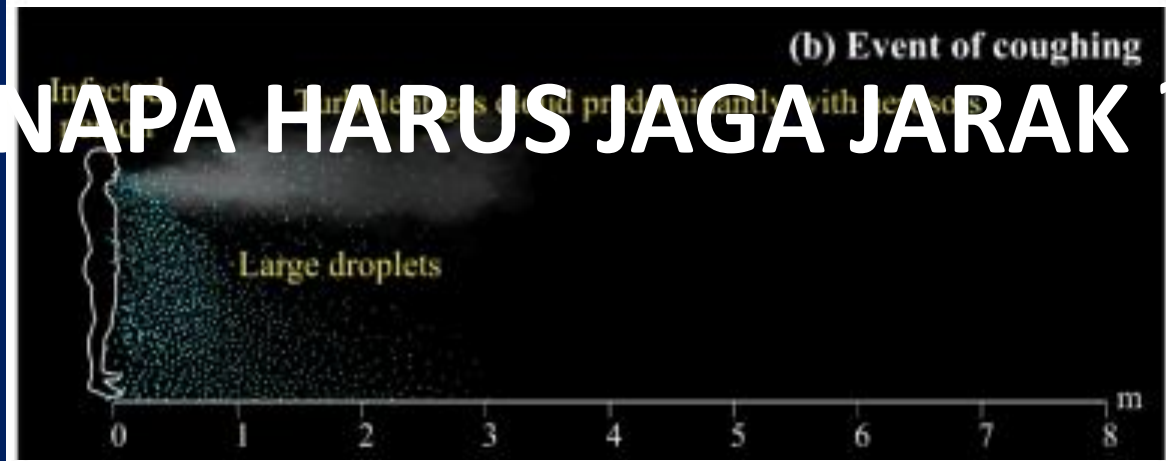
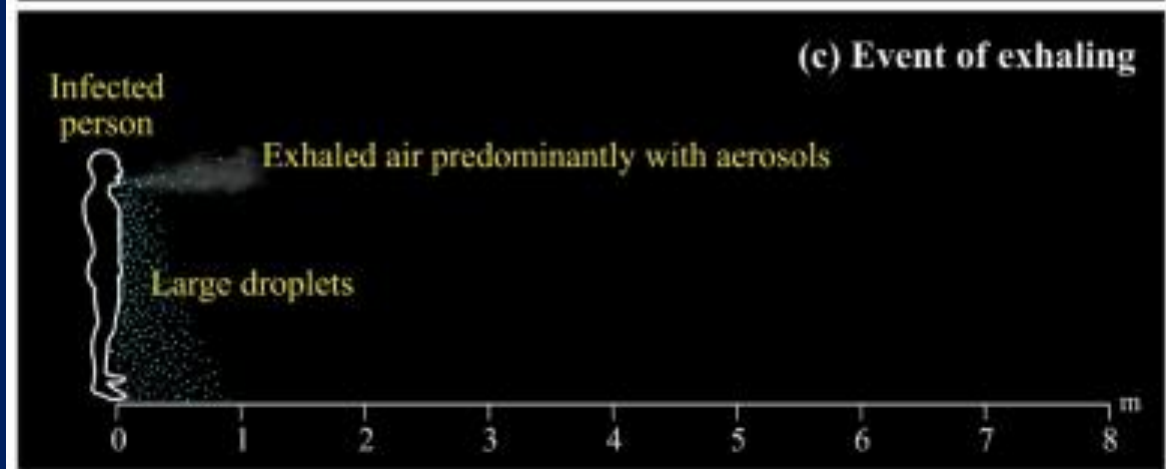
Patient Safety

A World Mission for Safer Health Care

SAVE LIVES

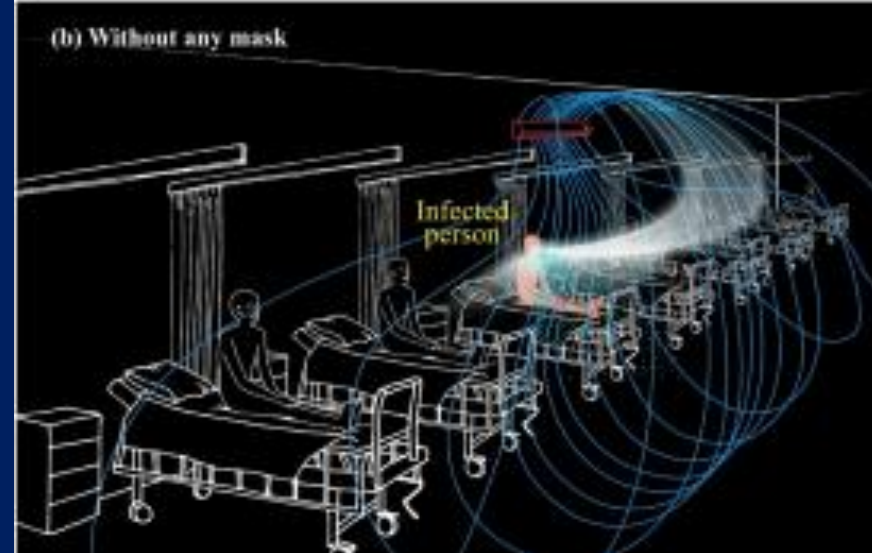
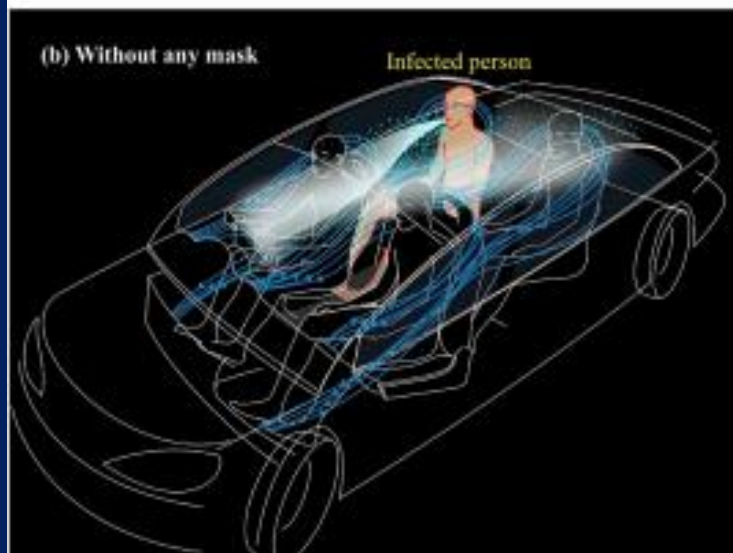
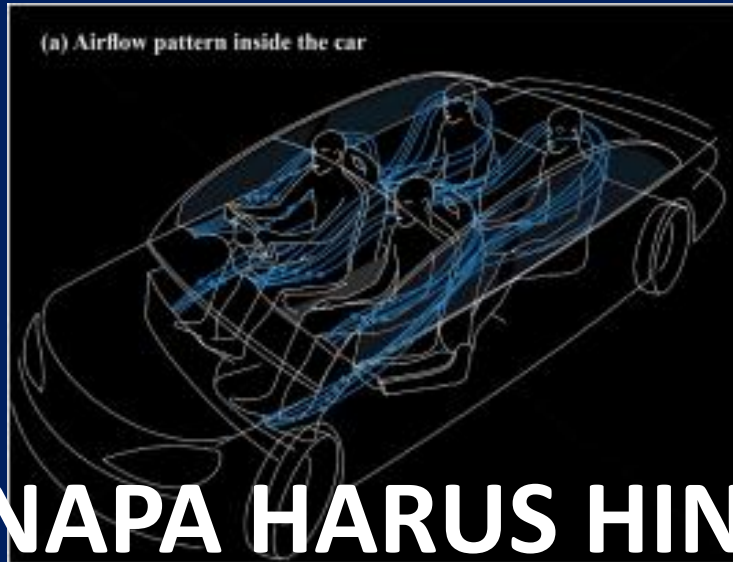
Clean Your Hands

KENAPA HARUS JAGA JARAK ???



Skema Model Transmisi SARS-COV-2 Indoor

KENAPA HARUS HINDARI KERUMUNAN???





SIS



???

MANA ME

Nutrisi dan Pola makan

- Nutrisi dan pola makan mengatur keseimbangan microbiome saluran cerna dan homeostasis system immune
- Protein
- Asam lemak esensial (omega-3 dan omega-6)
- Vitamin (vitamin B6, B12, asam folat, C dan D)
- Mineral (Zn, Cu, Fe dan Se)
- Prebiotic dan probiotic

Pola makan sehat di pandemic :

- Buat perencanaan menu makanan
- Prioritaskan penggunaan bahan segar
- Makan makanan olahan rumah
- Batasi asupan garam, gula dan lemak
- Konsumsi cukup serat
- Jaga keseimbangan cairan tubuh
- Hindari konsumsi alcohol dan minuman mengandung kafein

Physical exercise as a tool to help the immune system against COVID-19: an integrative review of the current literature

[Matheus Pelinski da Silveira](#),¹ [Kimberly Kamila da Silva Fagundes](#),¹ [Matheus Ribeiro Bizuti](#),¹ [Édina Starck](#),¹
[Renata Calciolari Rossi](#),² and [Débora Tavares de Resende e Silva](#)^{✉1}

Abstract

Go to: 

Acute viral respiratory infections are the main infectious disease in the world. In 2020, a new disease caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), coronavirus disease 2019 (COVID-19), became a global pandemic. The immune response to the virus depends on factors such as genetics, age and physical state, and its main input receptor is the angiotensin-converting enzyme 2. The practice of physical exercises acts as a modulator of the immune system. During and after physical exercise, pro- and anti-inflammatory cytokines are released, lymphocyte circulation increases, as well as cell recruitment. Such practice has an effect on the lower incidence, intensity of symptoms and mortality in viral infections observed in people who practice physical activity regularly, and its correct execution must be considered to avoid damage. The initial response is given mainly by type I interferons (IFN-I), which drive the action macrophages and lymphocytes, followed by lymphocyte action. A suppression of the IFN-I response has been noted in COVID-19. Severe conditions have been associated with storms of pro-inflammatory cytokines and lymphopenia, as well as circulatory changes and virus dispersion to other organs. The practice of physical activities strengthens the immune system, suggesting a benefit in the response to viral communicable diseases. Thus, regular practice of adequate intensity is suggested as an auxiliary tool in strengthening and preparing the immune system for COVID-19. Further studies are needed to associate physical exercise with SARS-CoV-2 infection.

Keywords: COVID-19, Exercise, Immune system, Coronavirus

Aktivitas Fisik

- WHO : **150 menit** latihan fisik sedang atau **75 menit** latihan fisik berat **dalam 1 minggu**
- Lakukan latihan fisik singkat dan berkala
- Mengikuti online exercise class
- Jangan meninggalkan aktifitas/kegiatan harian rutin
- Istirahat cukup

Knee to elbow



Side knee lifts



Touch one knee
your own pace.
seconds, and re
your heart and l



Touch your knee with your elbow, lifting the knee to the side, alternating sides. Find your own pace. Try to perform this for 1–2 minutes, rest for 30–60 seconds, and repeat up to 5 times. This exercise should increase your heart and breathing rates.

Squats



Chest opener



Place your feet at h
outwards. Bend the
heels on the ground
Bend and stretch th
more), rest for 30–
exercise strengthener

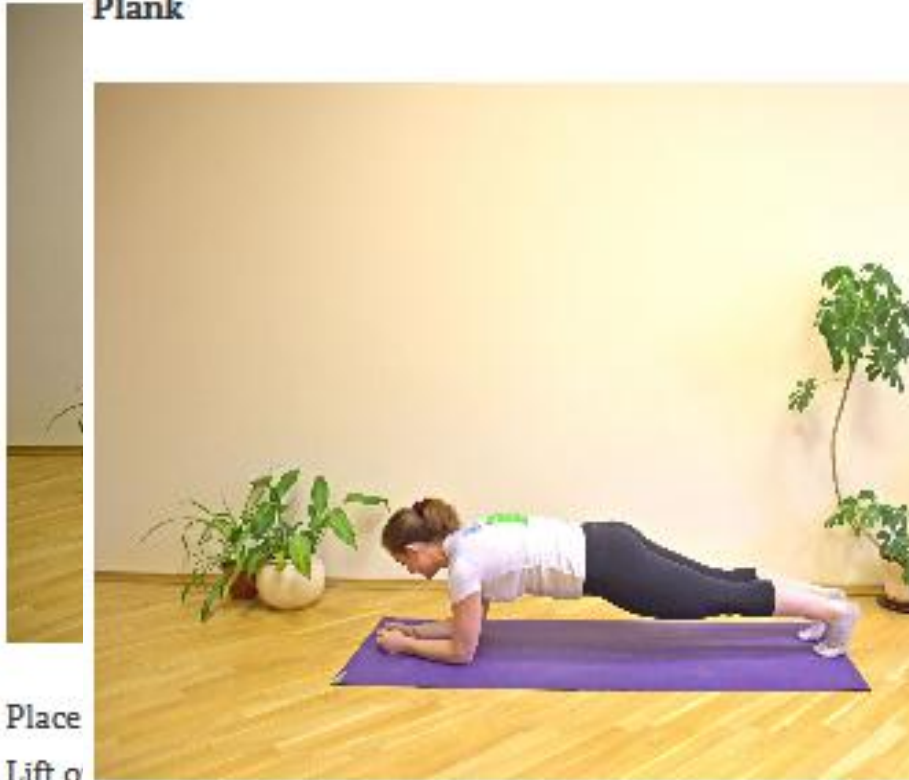


Interlace your fingers behind your back. Stretch your arms and open your chest forward. Hold this position for 20–30 seconds (or more). This position stretches your chest and shoulders.

Back extensions

Superman

Plank



Place
Lift o
Perfo
and r
glute:

Support your forearms firmly on the ground, with the elbows directly under the shoulders. Keep the hips at the level of the head. Hold for 30–60 seconds (or more, if possible), rest for 30–60 seconds, and repeat up to 5 times. This exercise strengthens your belly, arms and

Chair dips



Hold onto the seat of a chair, with your feet about half a meter away from the chair. Bend your arms as you lower your hips to the ground, then straighten the arms. Perform this exercise 10–15 times (or more), rest for 30–60 seconds, and repeat up to 5 times. This exercise strengthens your triceps.

- Faktor lingkungan mempengaruhi viabilitas mikroorganisme airborne : **suhu, kelembaban, radiasi sinar matahari** dan **ventilasi ruangan**

Relationships of viral payloads with environmental parameters.		
Environmental Parameter	Synthesized information	Reference
Daily minimum temperature with lagged effect of 5-7 days	Inverse relationship with numbers of daily SARS-CoV cases in Beijing and Hong Kong	Bi et al. (2007)
Air temperature at 4 °C and relative humidity (< 20% or > 80%)	Higher survival of payloads of transmissible gastroenteritis and mouse hepatitis viruses for extended days on surfaces in indoor environment	Casanova et al. (2010)
Temperatures of 22-25 °C and relative humidity of 40-50%,	Higher survival rates of SARS-CoV on smooth surfaces simulating typical air-conditioned environments	Chan et al. (2011)
Temperature at 38 °C, and relative humidity > 95%	Los of viability of SARS-CoV, simulating tropical climates	Chan et al. (2011)
Lower air temperatures (6 °C) and lower relative humidity (30%) than at higher relative humidity	Greater survival of coronaviruses in surfaces	Ijaz et al. (1985); Kim et al. (2007)
Lower air temperatures (6 °C)	Enhanced viral survival	Harper (1961)
Inadequate indoor ventilation	Enhanced infection risk of SARS-CoV in makeshift hospitals	WHO (2009)
With > 12 air changes per hour (ACH) (e.g., equivalent to > 80 L/s for a 24 m ³ -room) and controlled direction of airflow	Low risk of infectivity of viral diseases in an airborne precaution room	AIA (2001); Mayhall (2004); Wenzel (2003); WHO (2007)
Negative pressure of > 2.5 Pa, an airflow having a difference between the exhaust to supply > 125 cfm (56 L/s), clean-to-dirty airflow, > 12 ACH for a new building, and > 6 ACH in existing buildings for an old building, and exhaust to the outside, or a HEPA-filter if room air is recirculated	Low risk of infectivity in an airborne infection isolation room	CDC (2003)

JAGA DIRI dan KELUARGA Anda dari Virus Corona dengan **GERMAS** (Gerakan Masyarakat Hidup Sehat)

Caranya:



- Makan dengan gizi yang seimbang



- Rajin olahraga dan istirahat cukup



- Jaga kebersihan lingkungan



- Tidak merokok



- Cuci tangan pakai sabun



- Gunakan masker bila batuk atau tutup mulut dengan lengan atas bagian dalam



- Minum air mineral 8 gelas/hari



- Makan makanan yang dimasak sempurna dan jangan makan daging dari hewan yang berpotensi menularkan



- Bila demam dan sesak nafas segera ke fasilitas kesehatan



- Jangan lupa berdoa

VAKSINASI

detikHealth > Berita Detikhealth > Detail Artikel

Senin, 07 Des 2020 17:45 WIB

Vaksin Corona Sudah Sampai di Indonesia, Ini Asal Negara dan Tingkat Keampuhannya

Nafilah Sri Sagita K - detikHealth

detikHealth > Berita Detikhealth > Detail Artikel

Senin, 25 Jan 2021 09:00 WIB

Indonesia Mulai Vaksinasi COVID-19, Menkes: Malaysia Ngomel Belum Dapat

Khadijah Nur Azizah - detikHealth

Sinovac: Brazil results show Chinese vaccine 50.4% effective

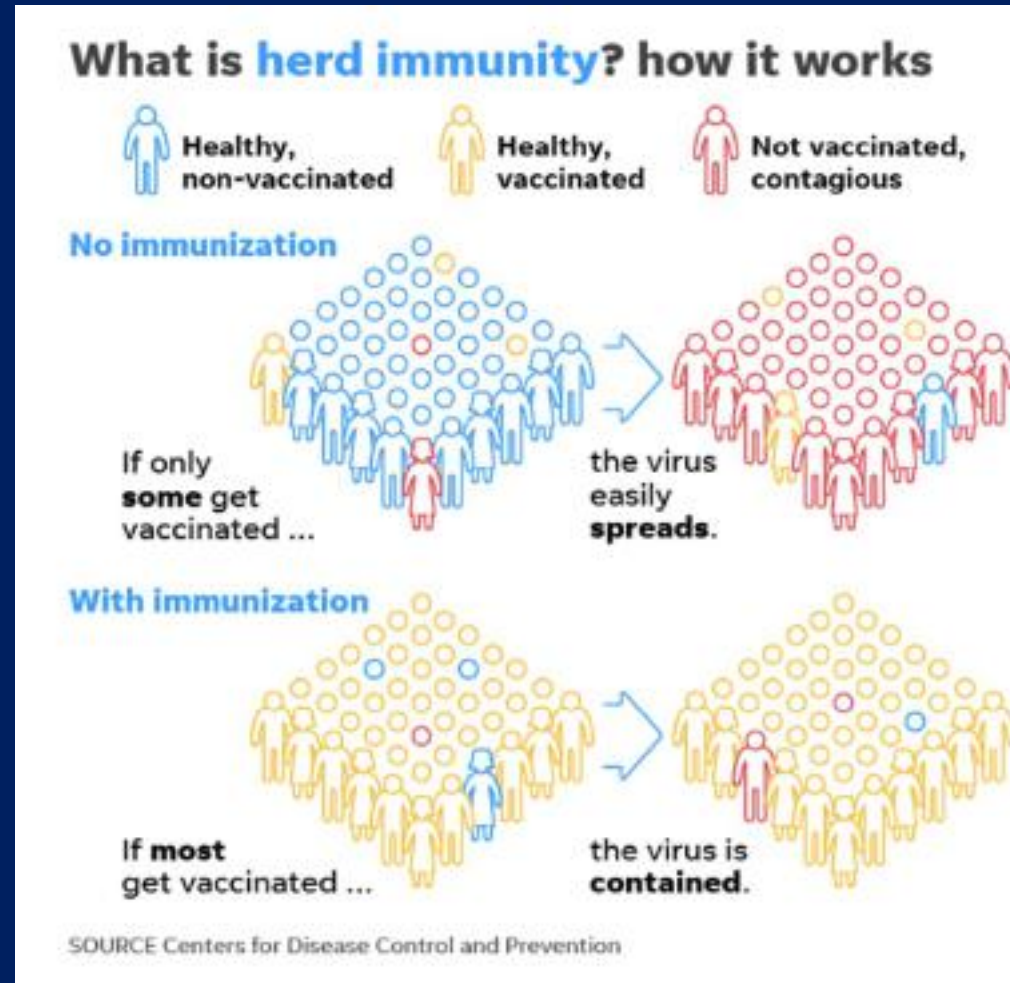
Sabtu, 23 Jan 2021 18:45 WIB

Kondisi Terkini 7 Relawan Vaksin Sinovac Bandung yang Positif COVID-19

Achmad Reyhan Dwianto - detikHealth

© 13 January

- Tujuan vaksinasi : membentuk *herd immunity* bila timbul kekebalan pada $> 70\%$ komunitas



JENIS VAKSIN COVID-19

NUCLEIC ACID VACCINES

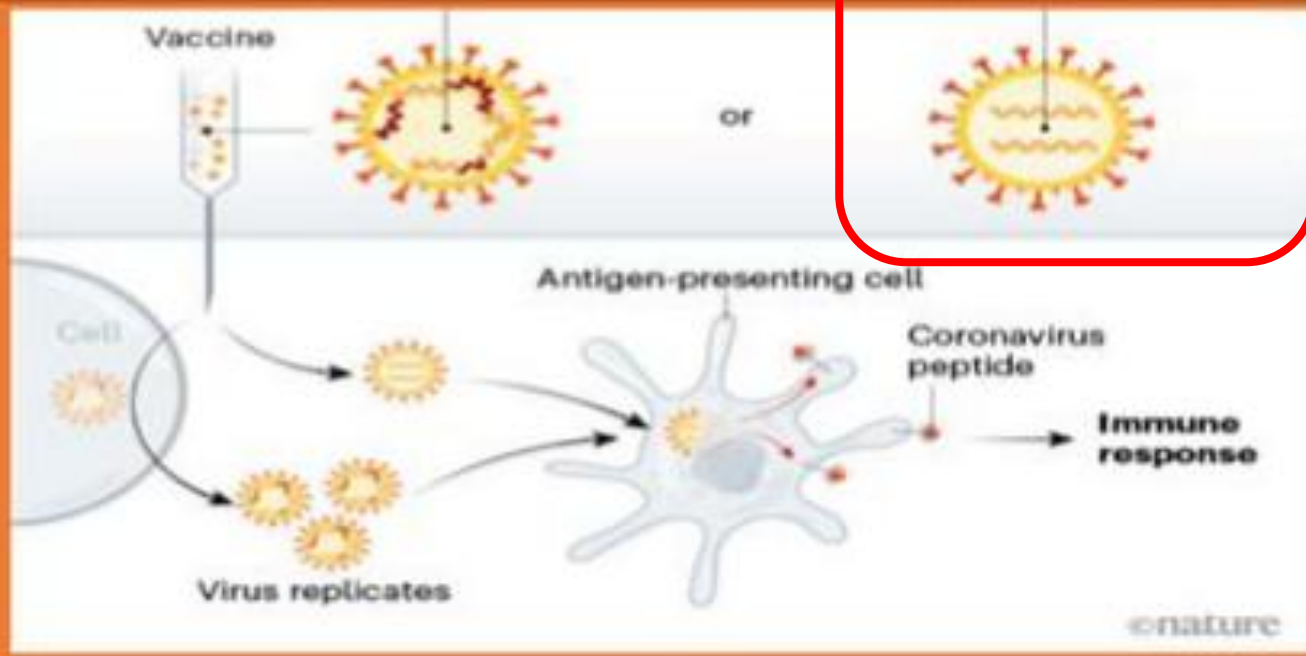
VIRAL VECTOR VACCINES

PROTEIN-BASED VACCINES

VIRUS VACCINES

Weakened virus

Saat ini di Indonesia
Inactivated virus



Merangsang system immune adaptif membentuk antibody spesifik (selular dan humoral) terhadap target virus

HAL YANG HARUS DIHINDARI

- KIPPI (Kejadian Iktus Perilaku dan Penyakit Infeksi)
- Pembentukan kebiasaan yang memerlukan waktu lama
- Lamanya waktu yang diperlukan untuk membentuk kebiasaan
- Vaksinasi

1 Sering Cuci Tangan Pakai Sabun

2 Tetap Tinggal di Rumah

3 Jaga Jarak dan Hindari Kerumunan

4 Tidak Berjabat Tangan

5 Pakai Masker Bila Sakit atau Harus Berada di Tempat Umum

GERMAS

www.promkes.kemkes.go.id

dan

n

PENUTUP

- Pemahaman tentang metode transmisi COVID-19 akan melindungi Anda dan keluarga di rumah
- Perlu peningkatan kewaspadaan paparan akibat perilaku di lingkungan di luar rumah
- Penerapan protocol kesehatan dengan disiplin dan baik di semua lingkungan di luar rumah
- Mengubah mindset dan perilaku di era New Normal
- Vaksinasi bukan jawaban utama untuk terhindar COVID-19

