

FLCCC Webinar, 16th August 2023



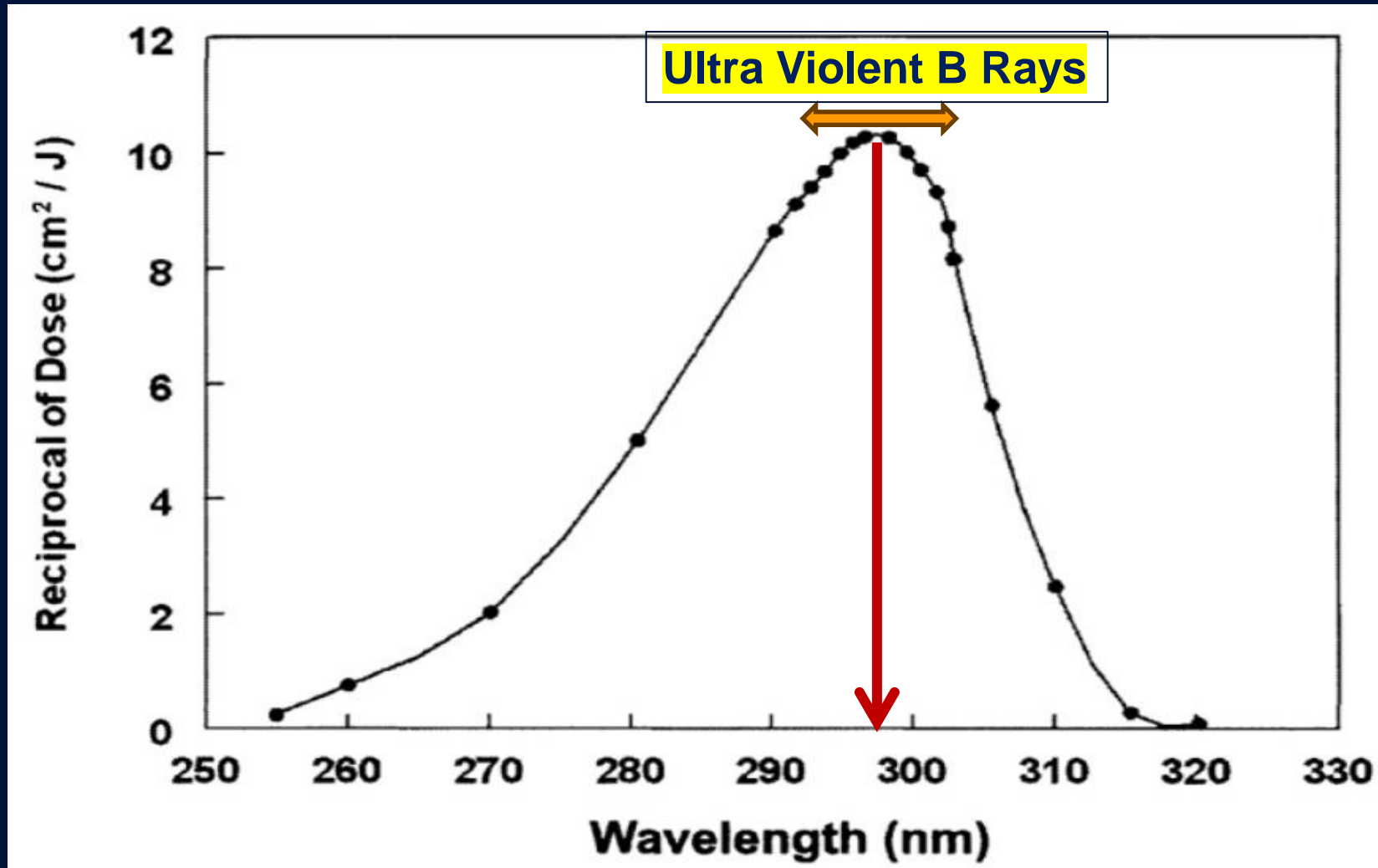
**Vitamin D and The Immune System:
What Do We Need to Know?**

**Sunil J. Wimalawansa, MD, PhD, MBA, FACP, FRCP, FRCPath, DSc
Professor Medicine, Endocrinology & Nutrition**

Fundamentals of Vitamin D

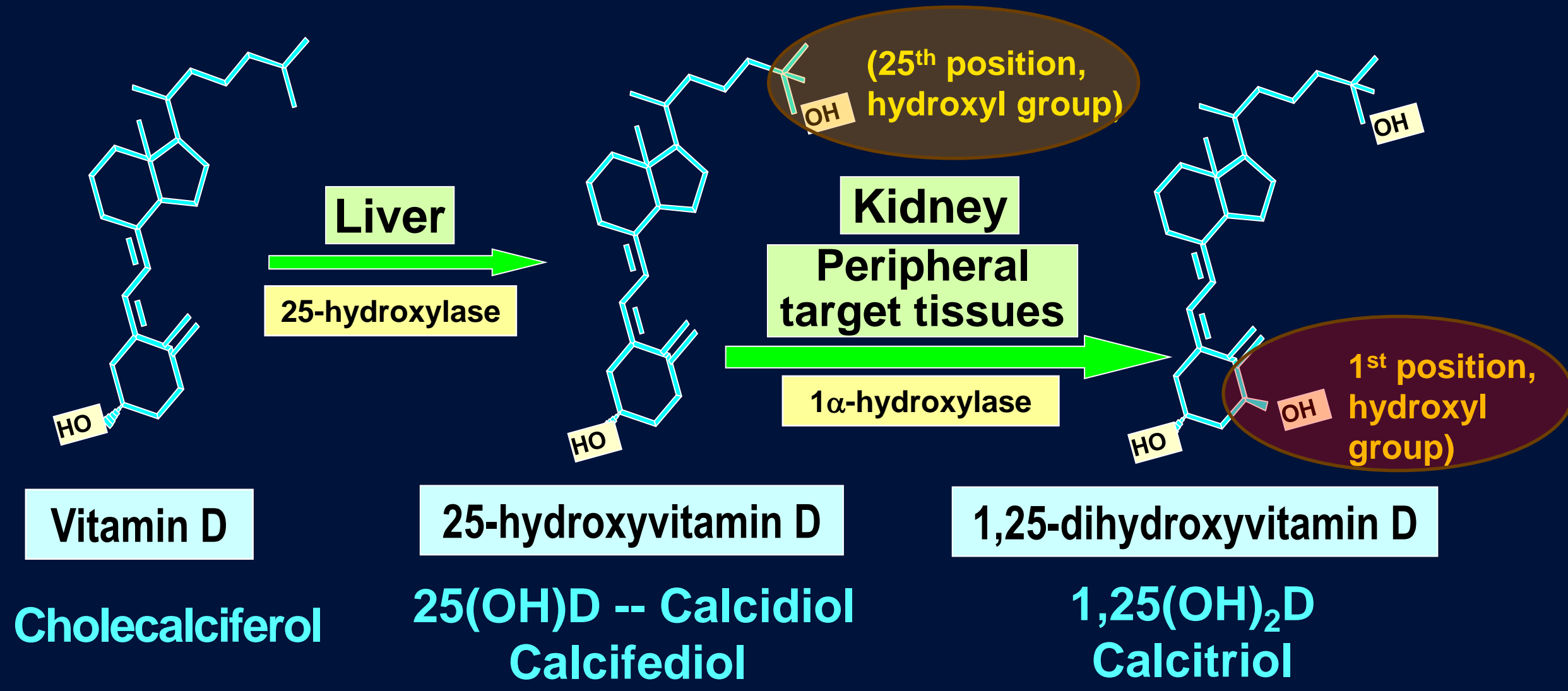
- In the USA and Europe, D₃ is considered a dietary, nutritional supplement
- D₃ is preferred — 50,000 IU is the highest commercially available dose
- Vitamin D has a wide therapeutic index, broader benefits, and able to monitor — stable shelf life, minimum drug interactions, and is inexpensive.

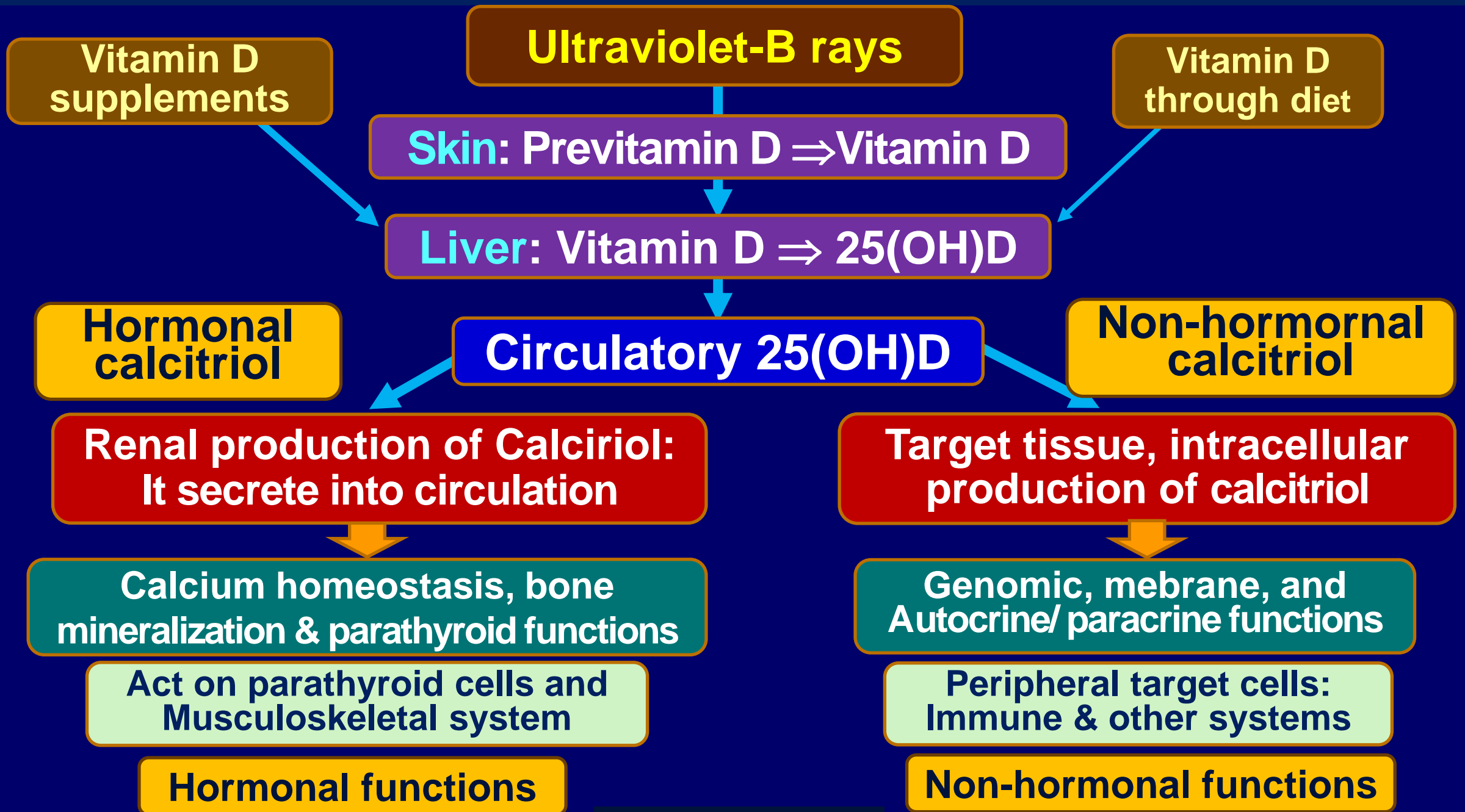
Conversion of 7-Dehydrocholesterol (DHC) to Previtamin D₃ in Human Skin



**Sun is the
Best Source
of Vitamin D**

Activation of Vitamin D Compounds





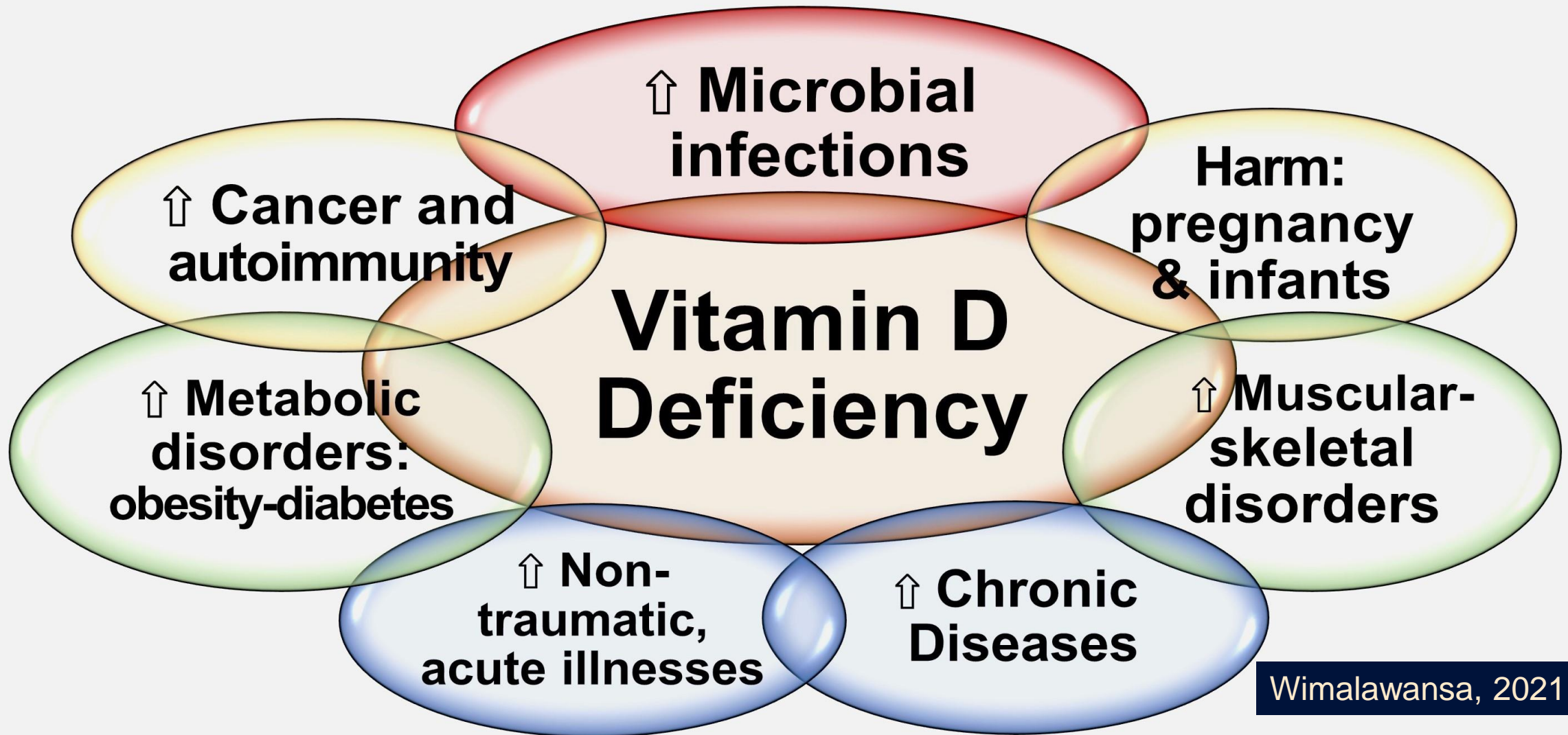
“Vitamin D: Nature’s Sunkissed Superhero”

- **Doctors Paul Marik, Pierre Kory and colleagues at the Front Line COVID-19 Critical Care Alliance [FLCCC <https://covid19criticalcare.com>] published a Substackan article:**

<https://flccc.substack.com/p/vitamin-d-natures-sunkissed-superhero>

Vitamin D Deficiency: Causes and Ways to Overcome

Vitamin D Deficiency



Factors Influencing Vitamin D Levels

- Sun avoiding behavior
- Insufficient UV-B rays from sunlight—as in winter
- Excess body fat—overweightness affecting the bioavailability of vitamin D
- Taking medications—increasing vitamin D catabolism
- Darkness of skin color (melanin)—skin scars (e.g., burns), requires longer UVB exposure
- Age—low precursor—7HC in the skin: less conversion by UVB into vitamin D.

Three Ways to Increase Vitamin D to prevent global vitamin D deficiency & its negative health consequences

- **Sensible daily sun exposure**
- **Supplementation with vitamin D and other micronutrients**
- **Food fortification programs**





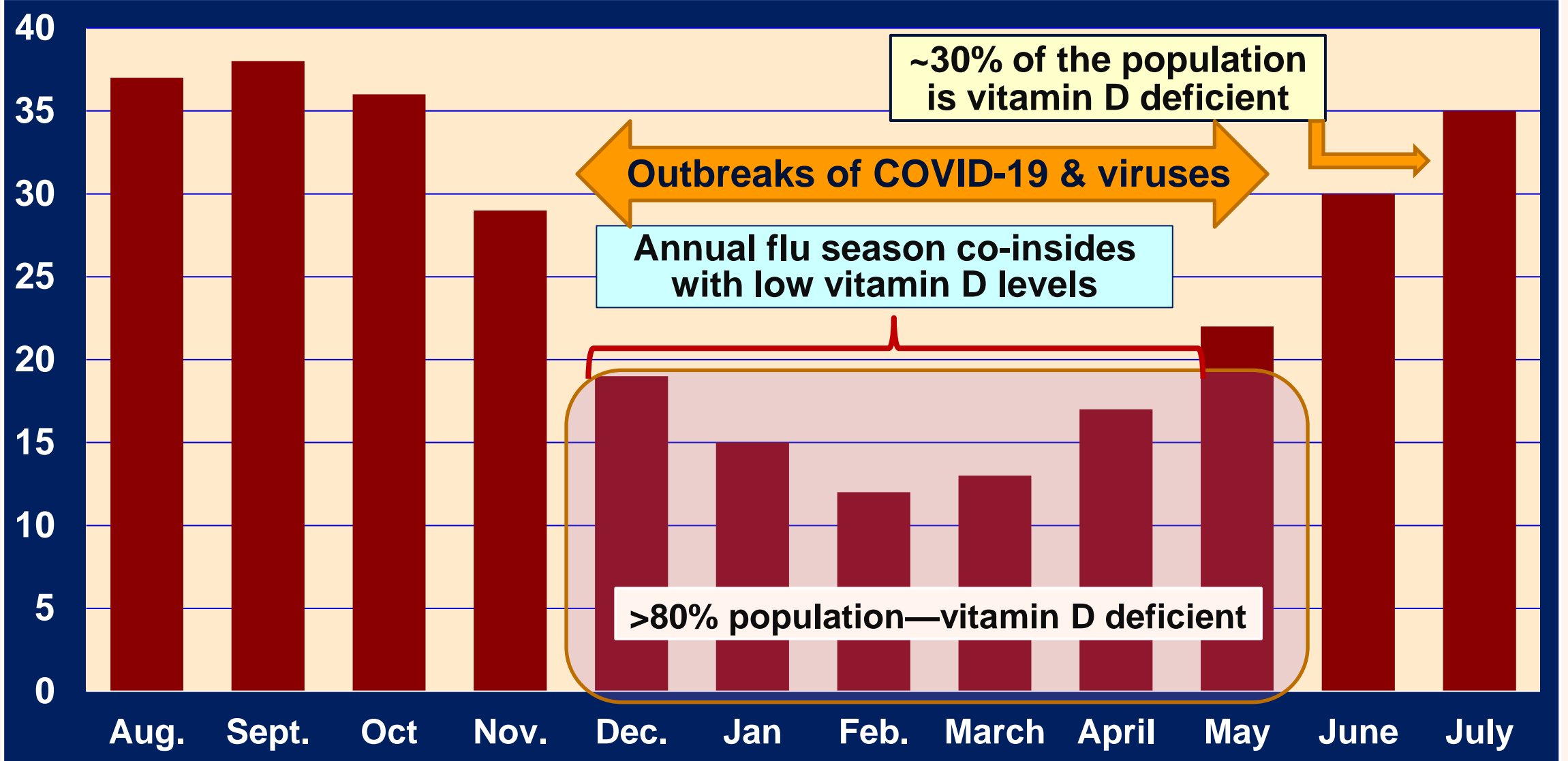
“Person with lighter skin, exposure to sunshine for 20 minutes can prevent vitamin D deficiency”



“Hypovitaminosis D, daily exposure up to an hour is necessary for generating sufficient vitamin D to overcome diseases”

Mean Serum 25(OH)D Concentration Over a Calendar

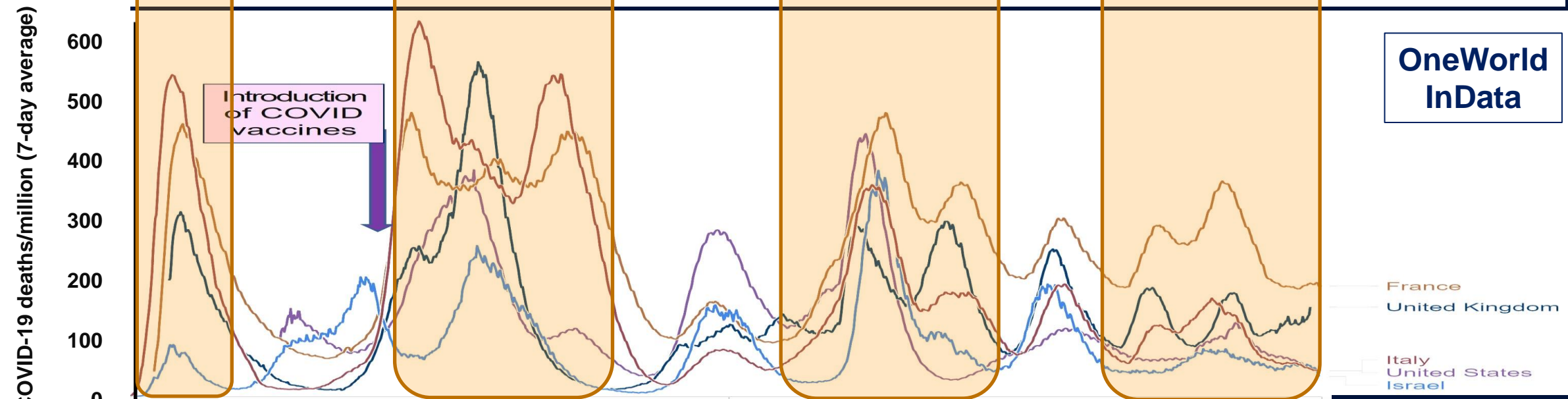
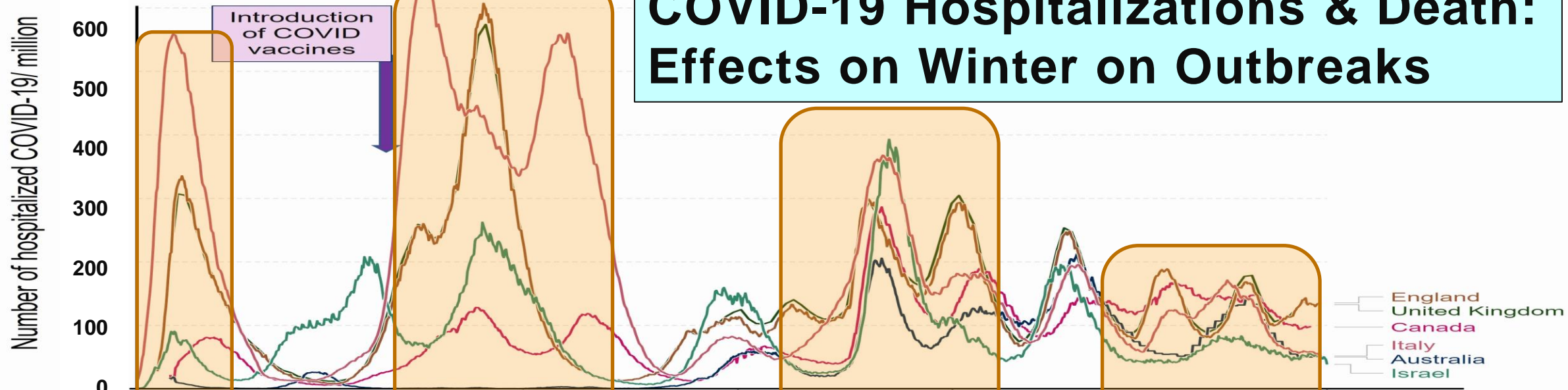
Mean Serum 25(OH)D concentration



Month of the year

**Winter - Associated
Flu & SARS-CoV-2
Outbreaks**

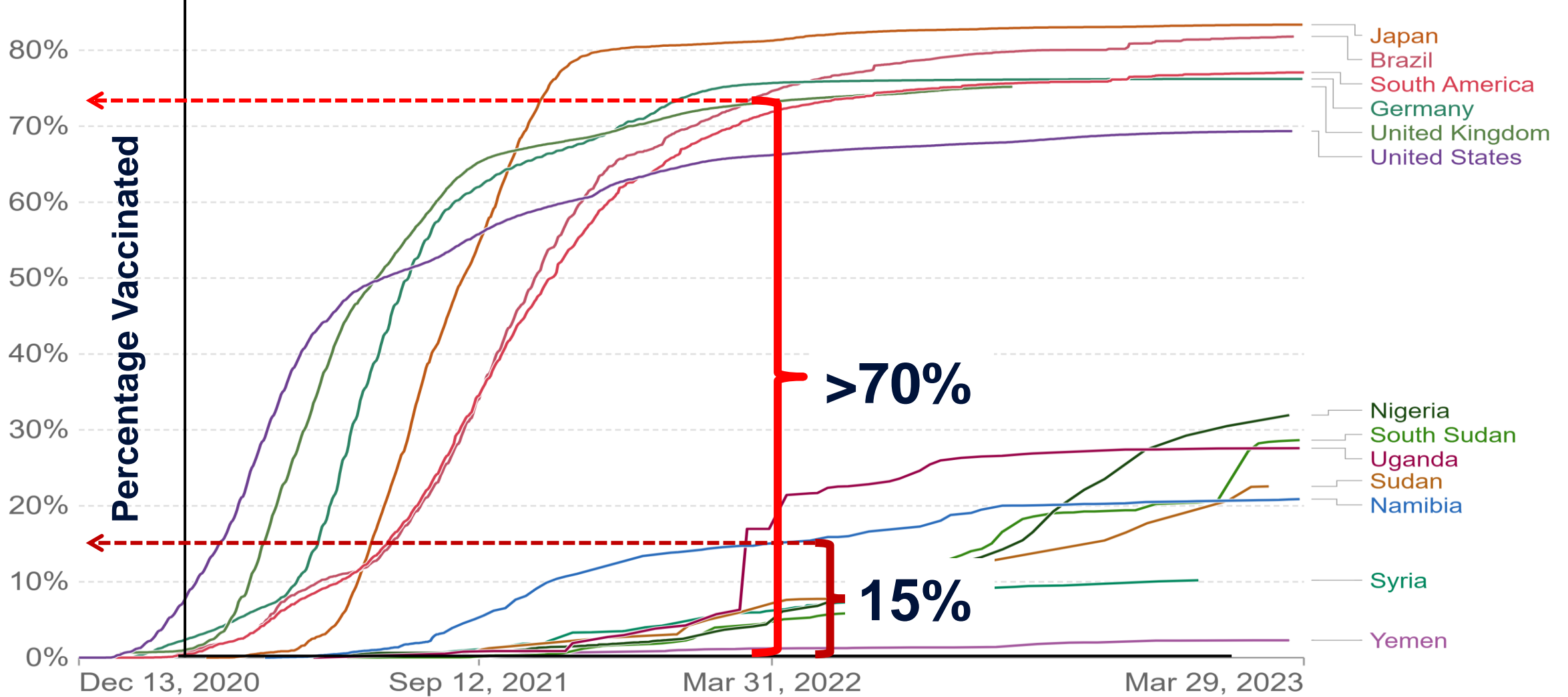
COVID-19 Hospitalizations & Death: Effects on Winter on Outbreaks



OneWorld
InData

Percentage of People who Completed COVID-19 Vaccination

Total population of the country.



Source: Official data collated by Our World in Data

Note: Alternative definitions of a full vaccination, e.g. having been infected with SARS-CoV-2 and having 1 dose of a 2-dose protocol, are ignored to maximize comparability between countries.

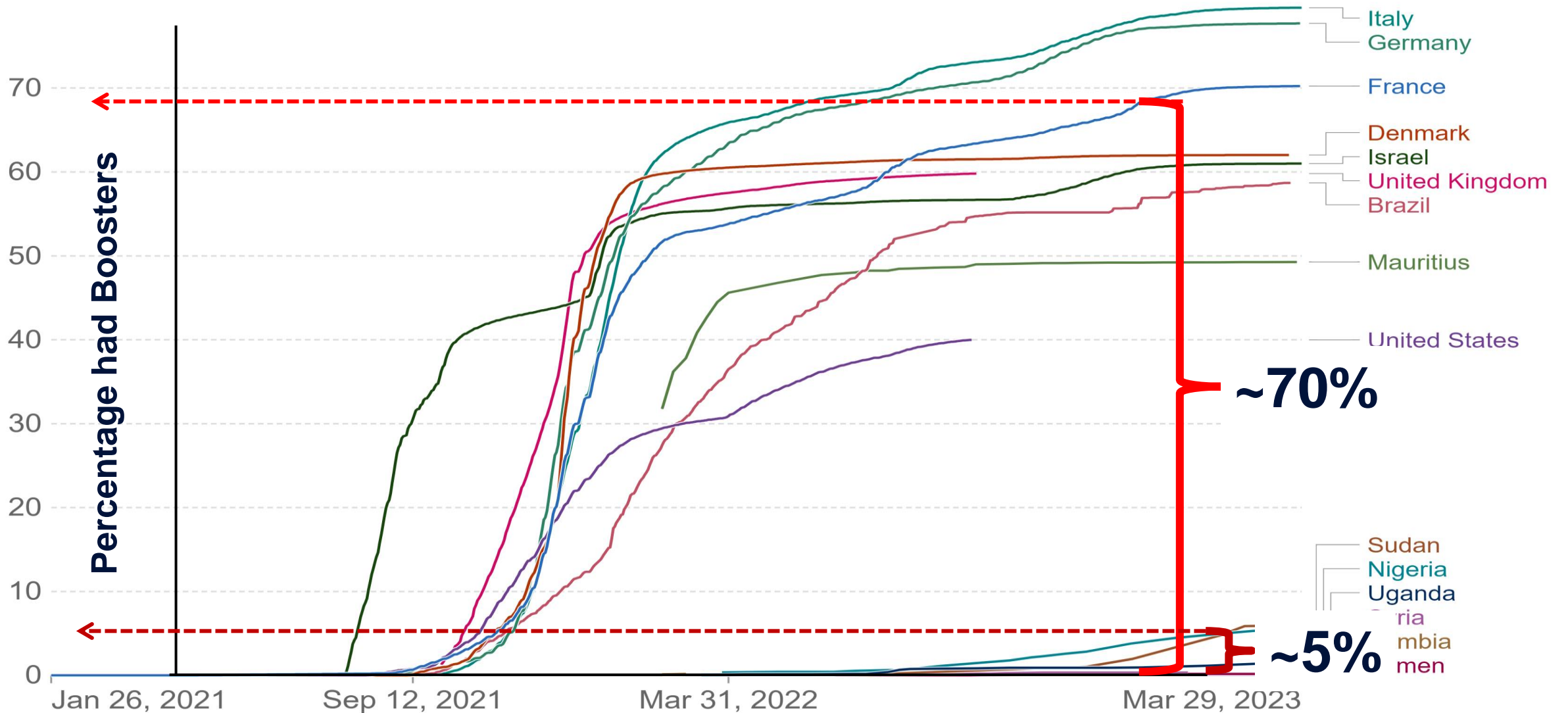
OurWorld in Data

CC BY

Wimalawansa, 2023

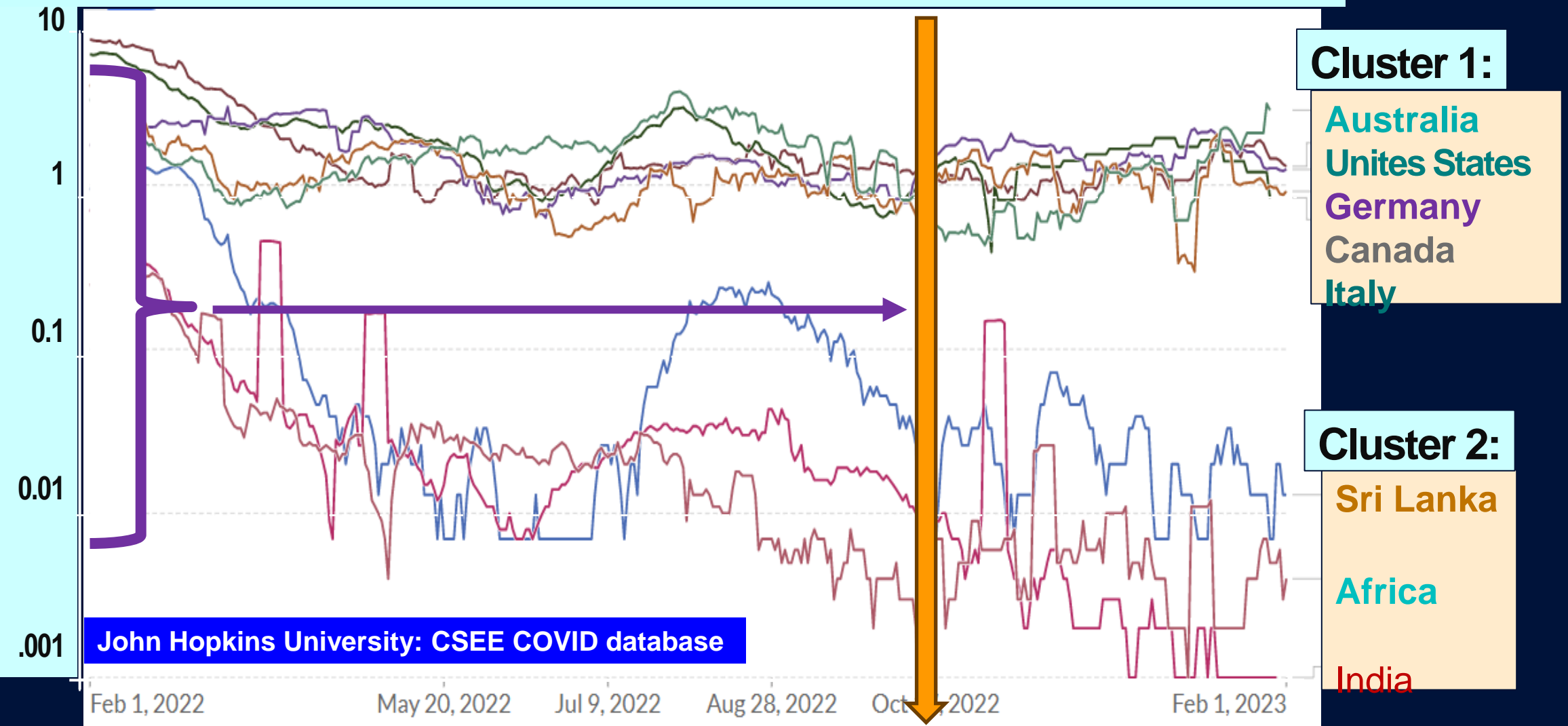
Percentage of People Who Had COVID Booster Doses

are doses administered beyond those prescribed by the original vaccination protocol.



CoVID-19 deaths/ million population (Log)

COVID Deaths per Million Population Over Time



Deaths caused by COVID-19: Our World COVID data: John Hopkins University database, seven-day average deaths/million population. Natural separation into high-vaccinated and boosted vs. low-boostered countries.

Vitamin D and Cancer

Vitamin D Deficiency and Cancer

- **Vitamin D has a negative effect on cancer cell growth and damping metastasis, mainly via preventing chronic inflammation & oxidative stress, promoting apoptosis, and damping angiogenesis.**
- **Vitamin D modulates cancer through effect on cellular metabolism, suppress cancer cell glycolysis.**
- **Vitamin D is a negative regulator of NF- κ B. It inhibits activation and DNA binding of the major transcription factors. NF- κ B is a promoter of tumor cell proliferation and angiogenesis, which increase metastasis.**

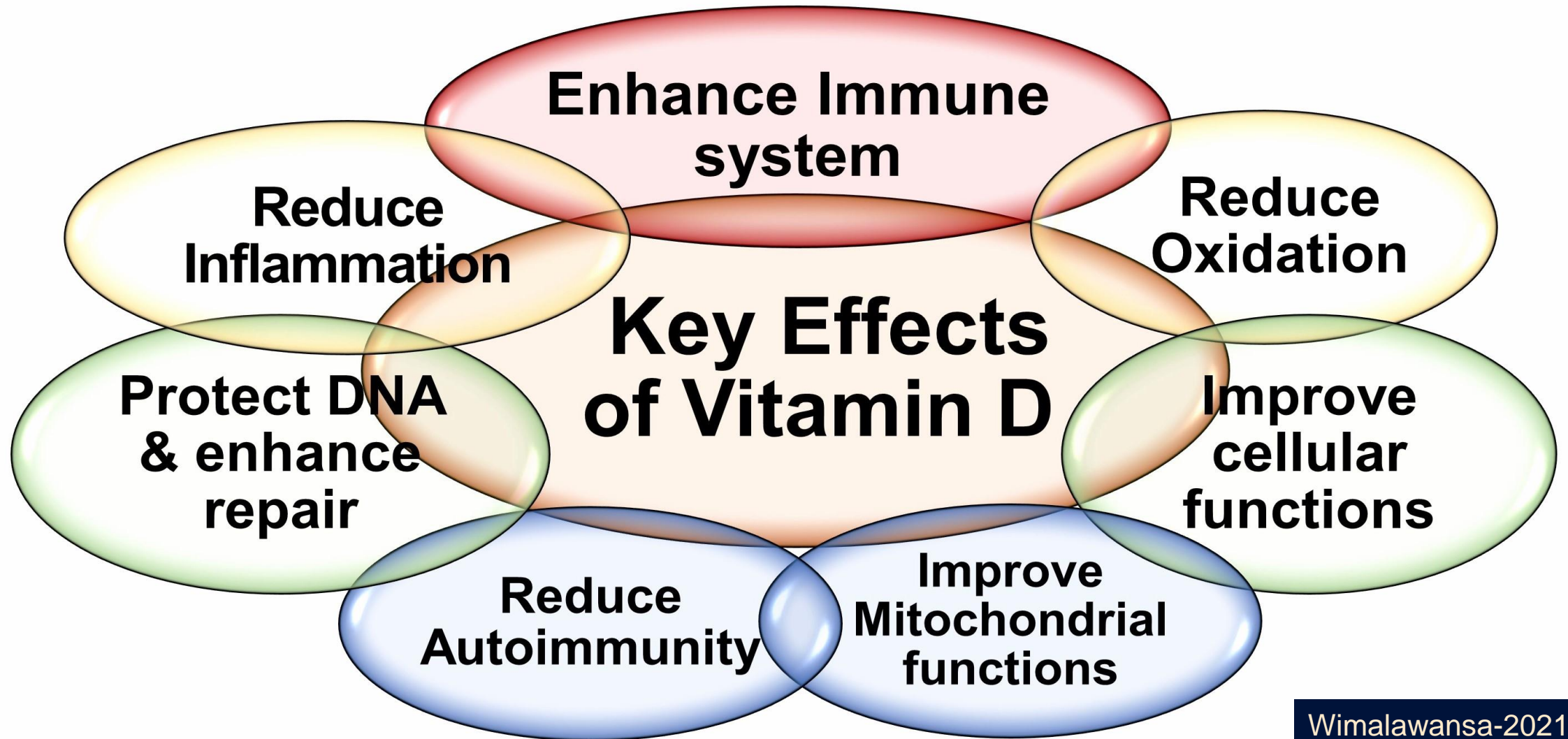
Vitamin D and Cancer

- **Vitamin D suppresses development of cancer and progression.**
- **NF-kB enhances inflammatory and anti-apoptotic genes, matrix metalloproteinases, and vascular endothelial growth factor, increasing glycolysis.**
- **Excessive NF-kB signaling could produce mutations in the p53 gene: Mutant p53 increases NF-kB anti-apoptotic activity.**

Vitamin

Key Functions

Key Functions of Vitamin D



Micronutrient Requirements For Immunity

- **Vitamins K₂, B₂, A, C, magnesium, zinc, selenium, omega-3 fatty acids, resveratrol, quercetin, also important for optimal immunity.**
- **Others include essential fatty acids such as omega 3, iron, iodine (T₃), etc.—a combination enhances the efficacy of vitamin D in boosting the immune system.**

Micronutrient Requirements For Immunity

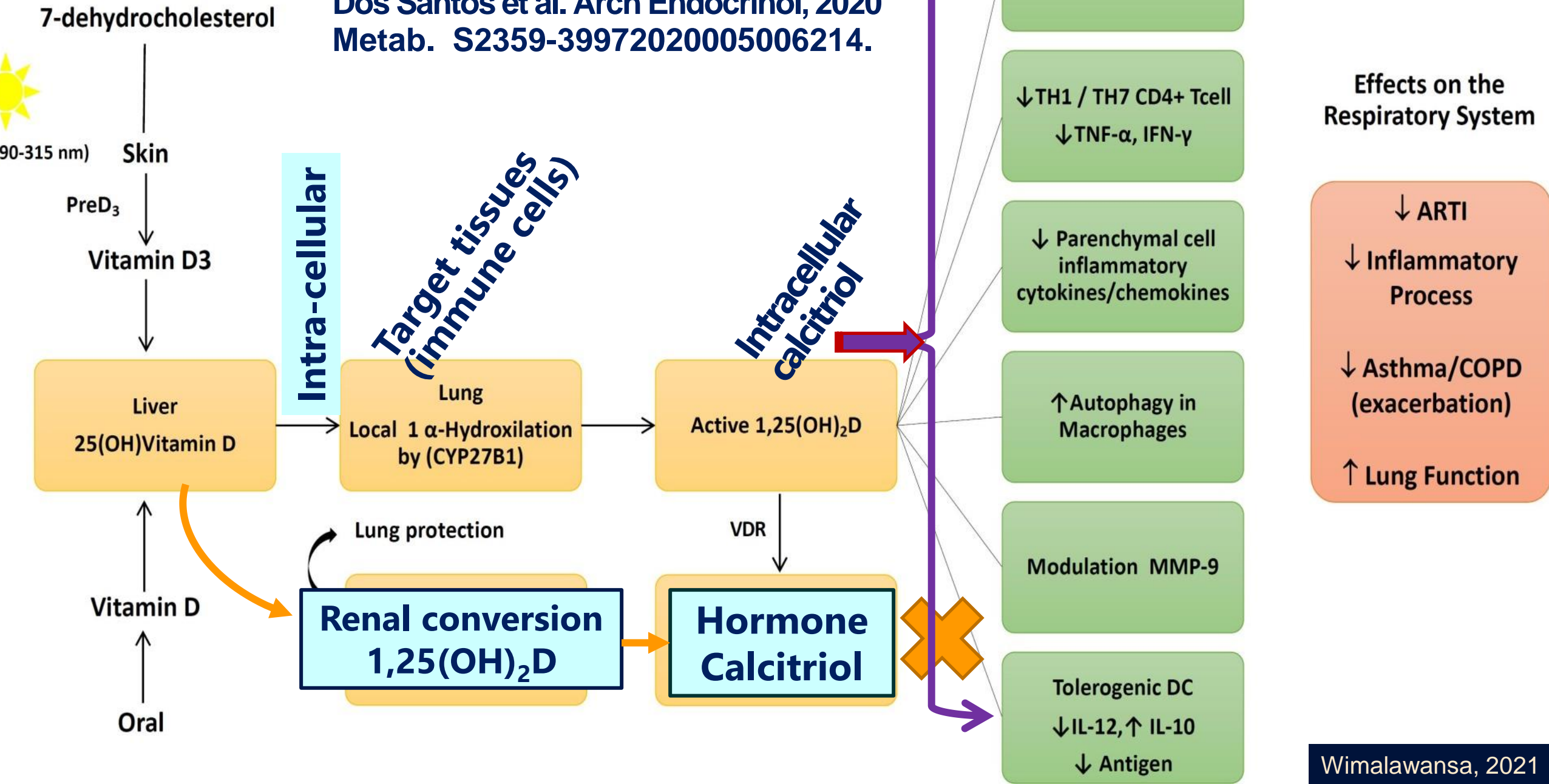
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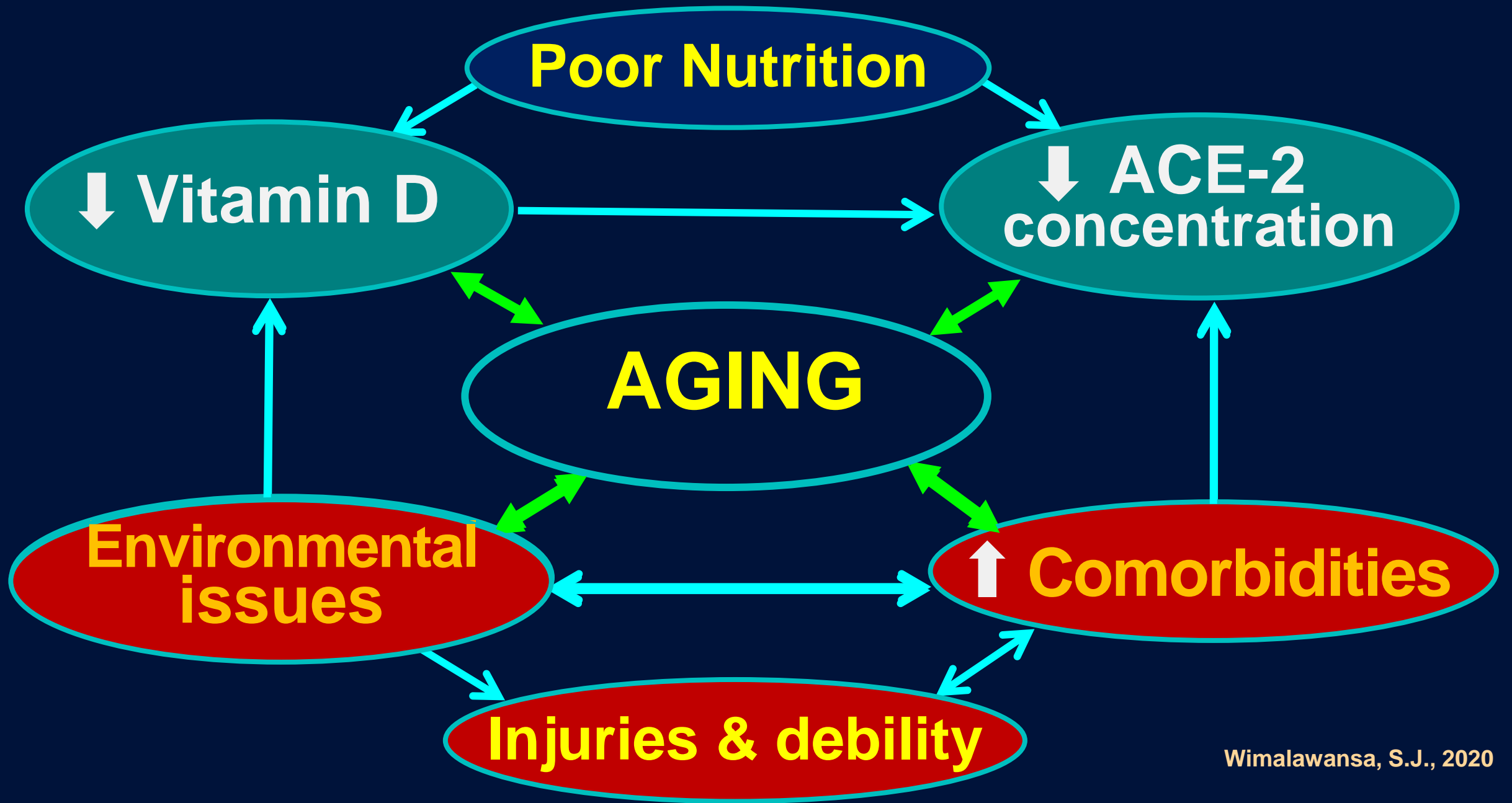
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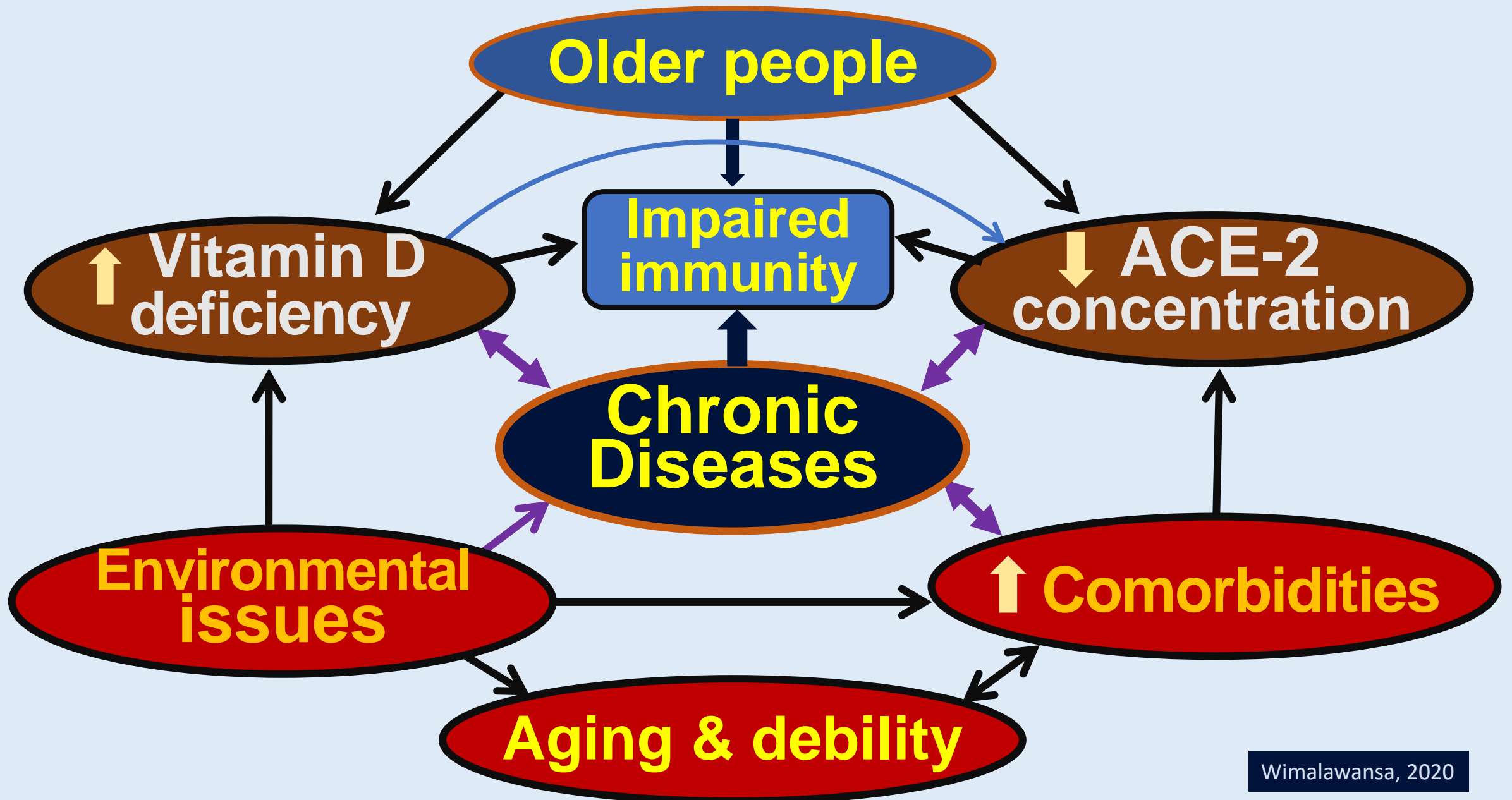
Mechanisms of action of Vitamin D

Dos Santos et al. Arch Endocrinol, 2020
Metab. S2359-39972020005006214.

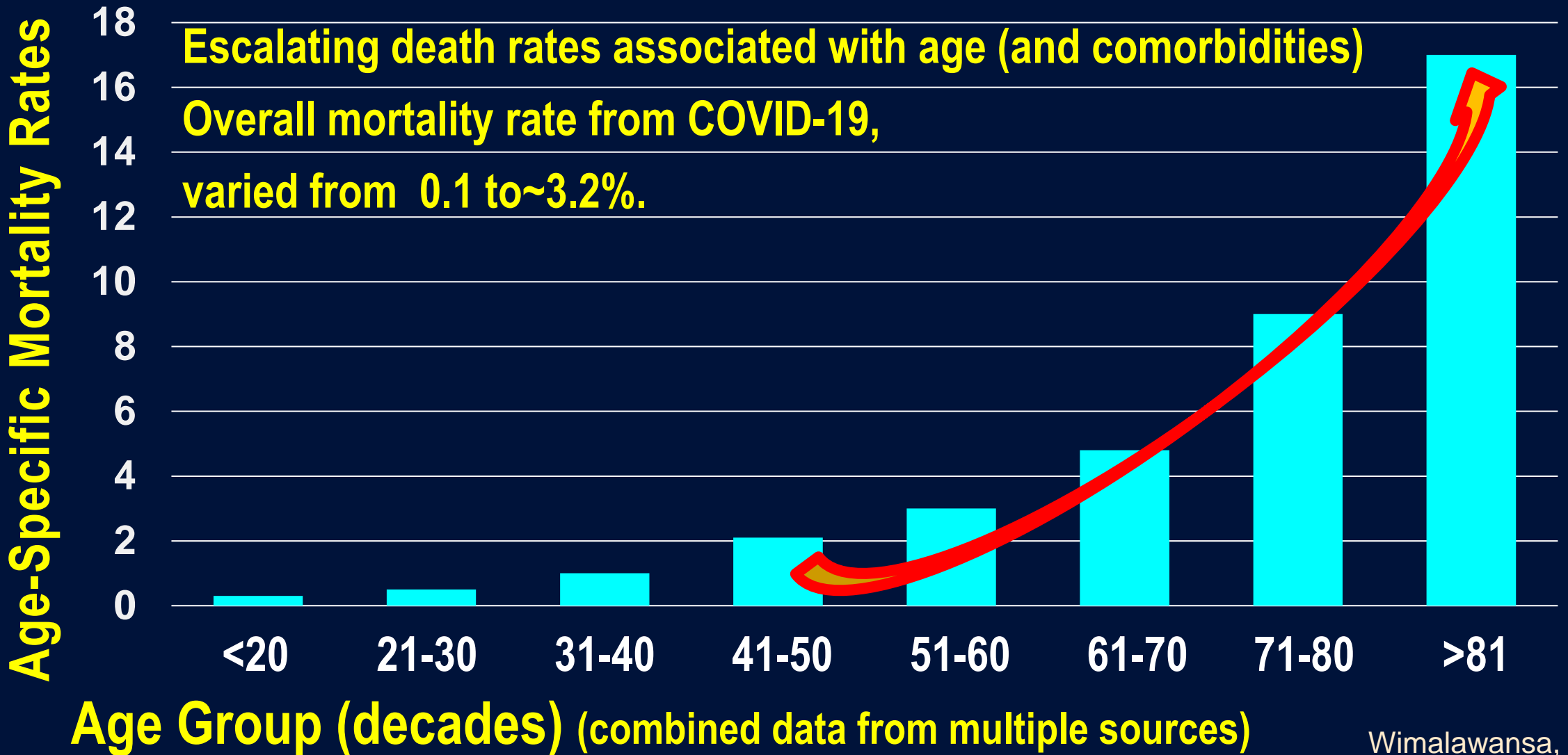


**The Effects of Aging and
Co-Morbidities on Vitamin
D and Infections:
SARS-CoV-2**

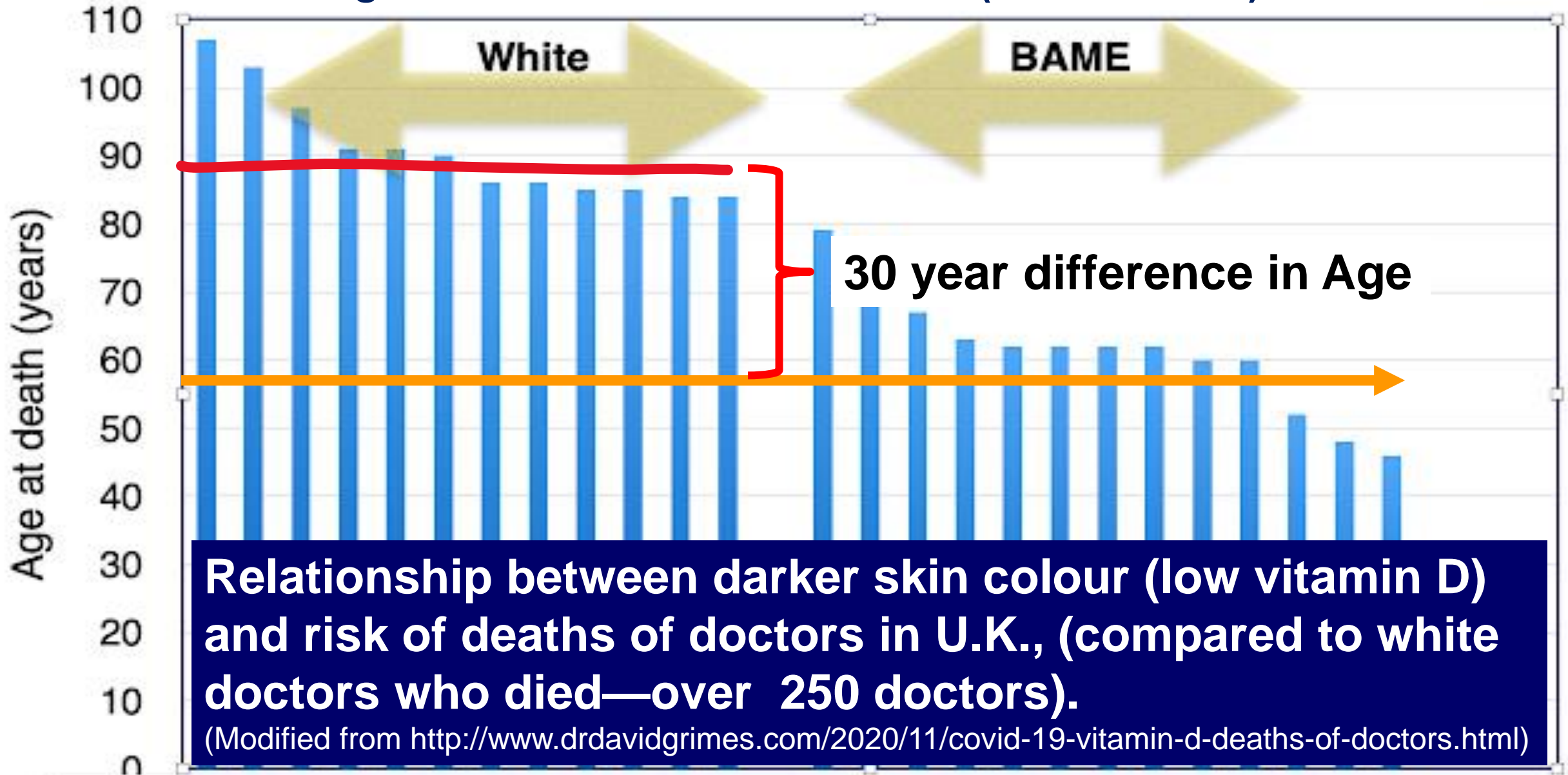




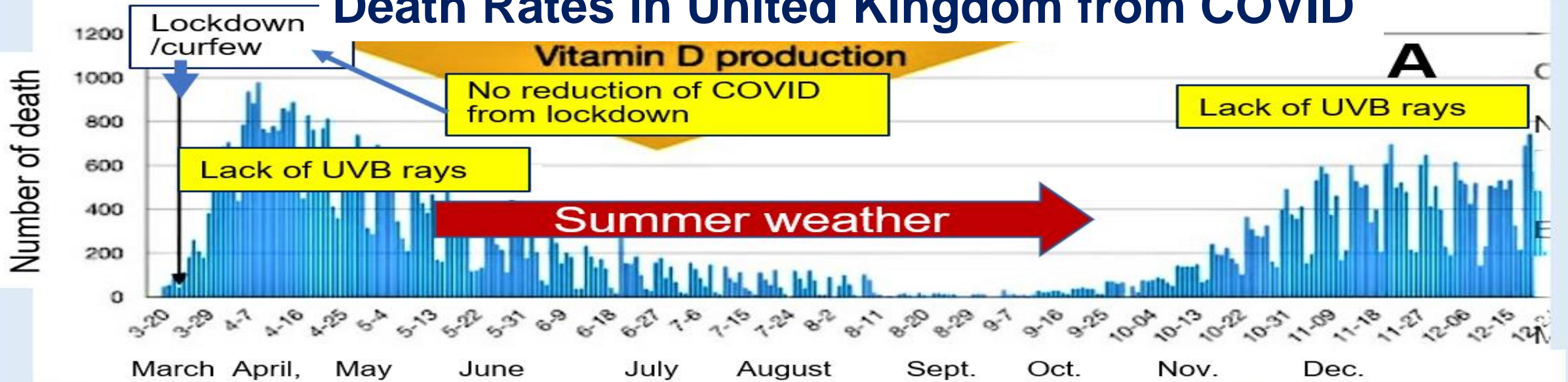
Age-Related Mortality Rate From COVID-19



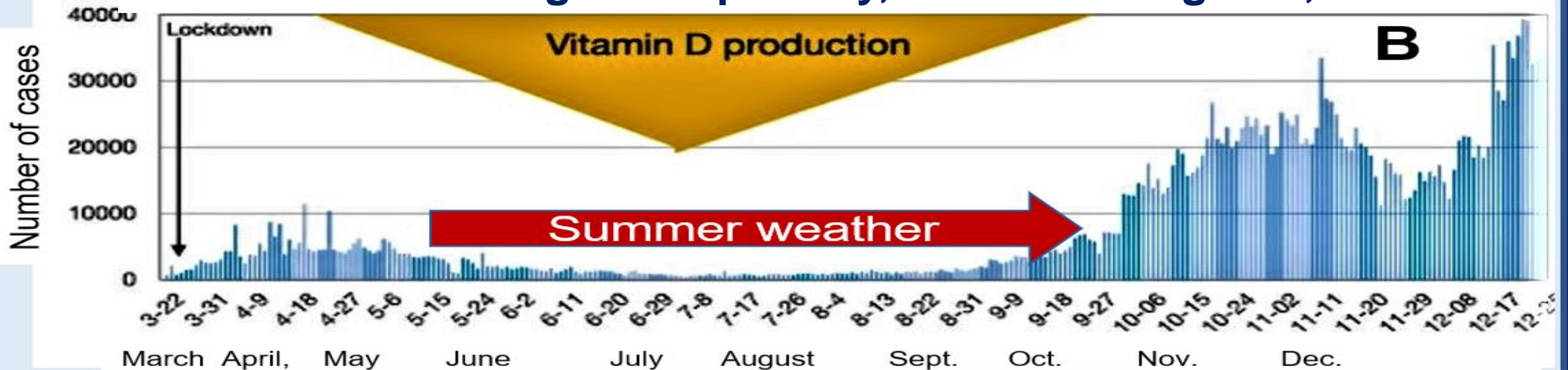
Mean Age at Death of Doctors in UK (from COVID)



Death Rates in United Kingdom from COVID



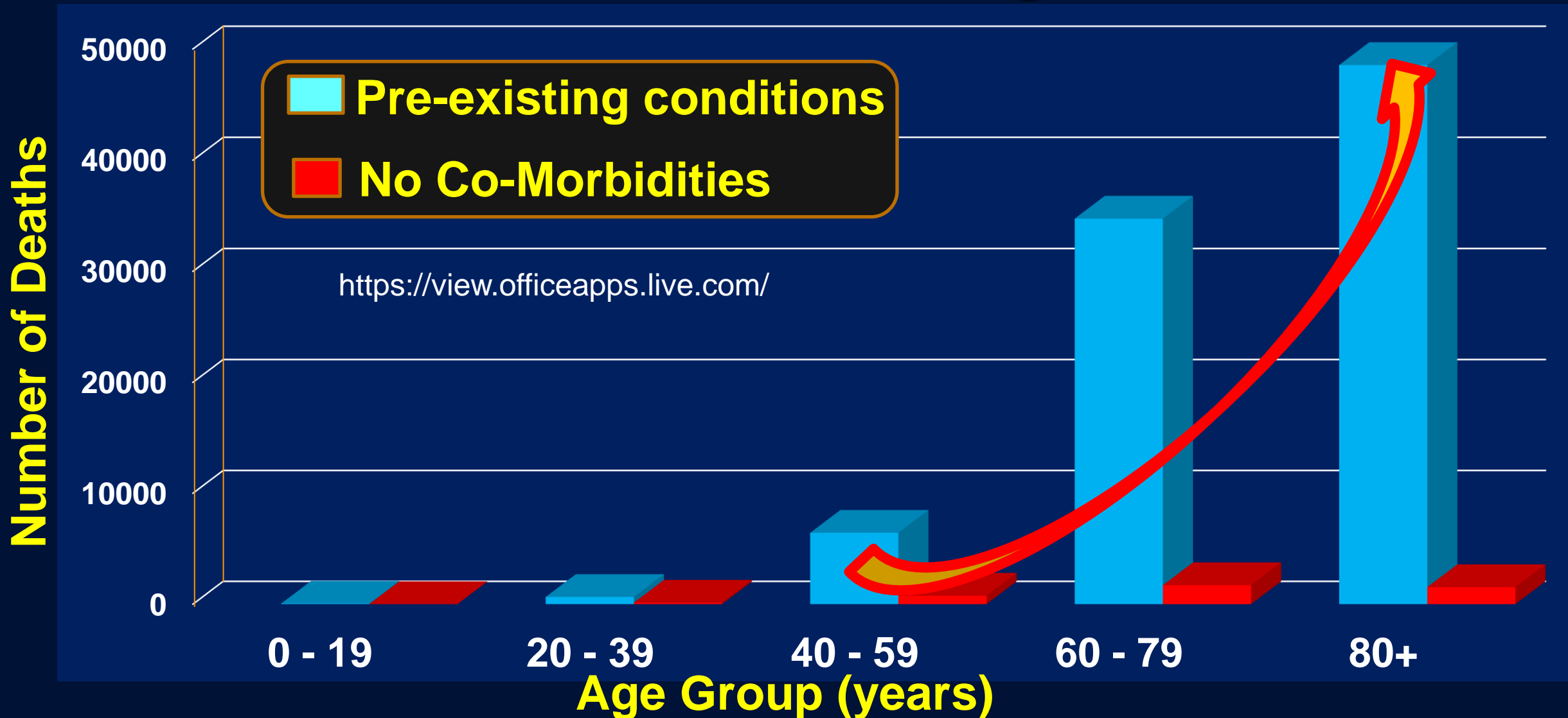
COVID Patients Diagnosed per Day, in United Kingdom, 2021



(modified after Dr. David Grimes, UK, Jan. 1, 2021)



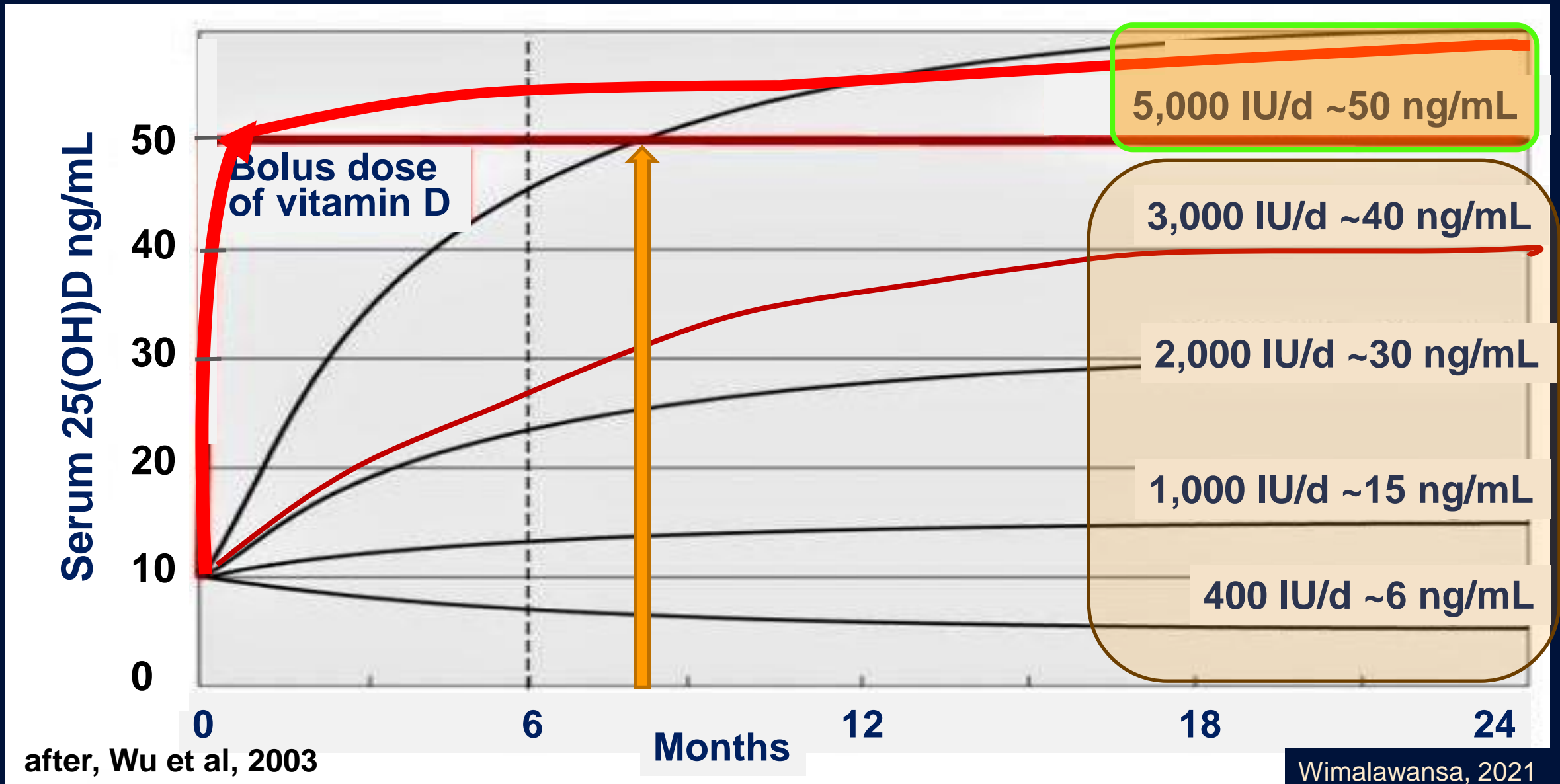
COVID Deaths From Pre-existing Conditions



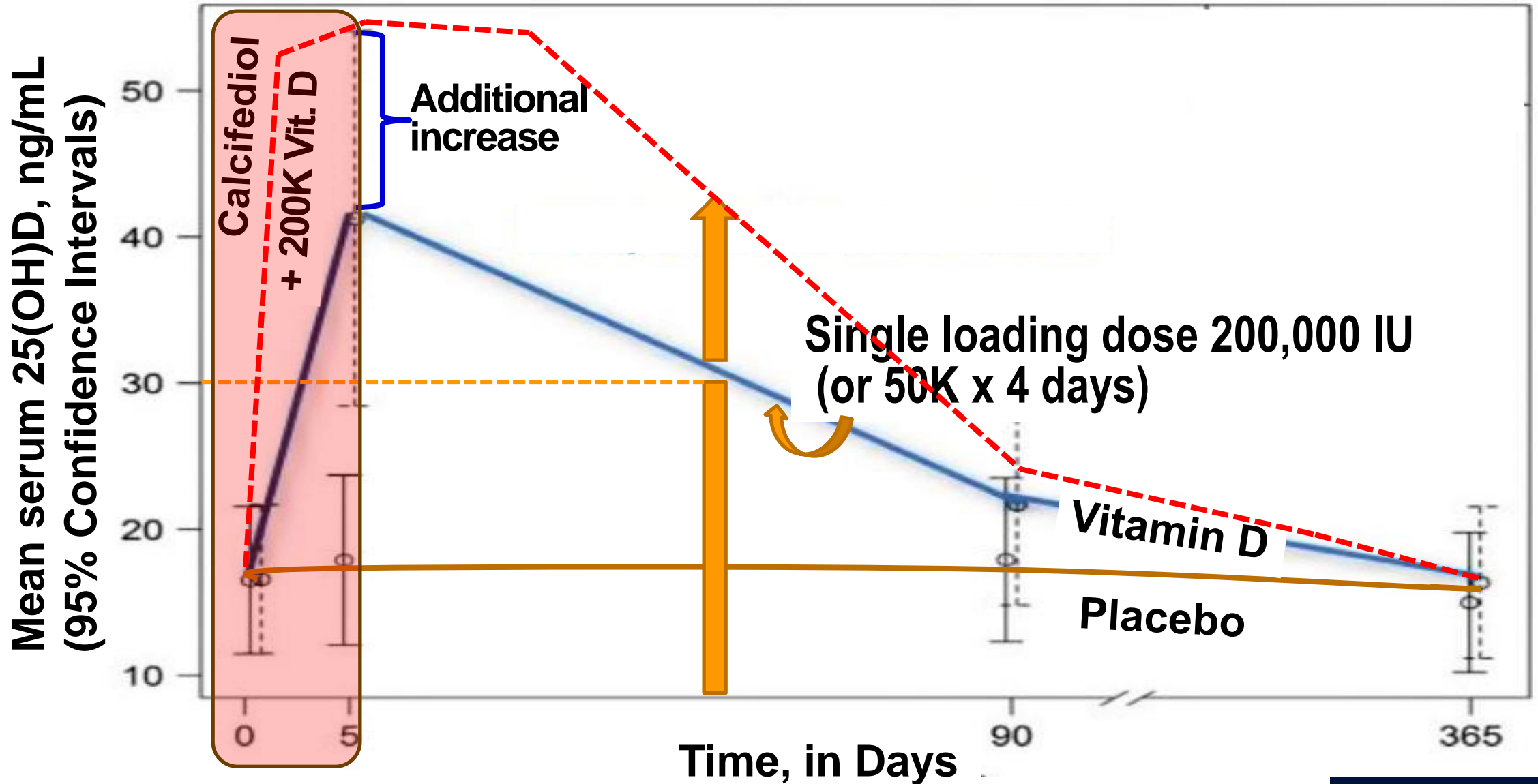
<https://view.officeapps.live.com/>

**Relationship Between
Oral Vitamin D and Serum
25(OH)D Concentrations**

Supplement to Maintain 25(OH)D Concentration



Serum 25(OH)D Levels After 200,000 IU Dose

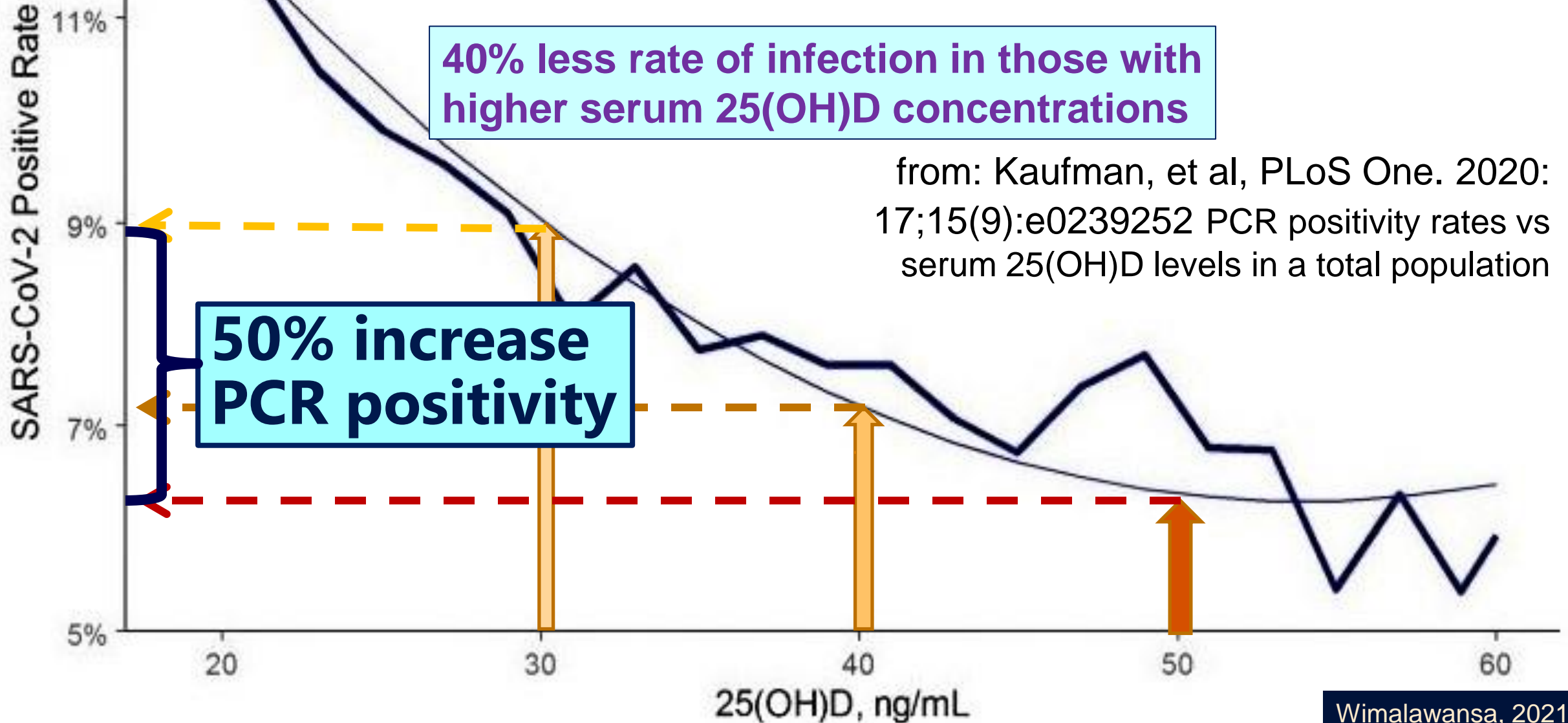


Vitamin D Effects on the Immune System

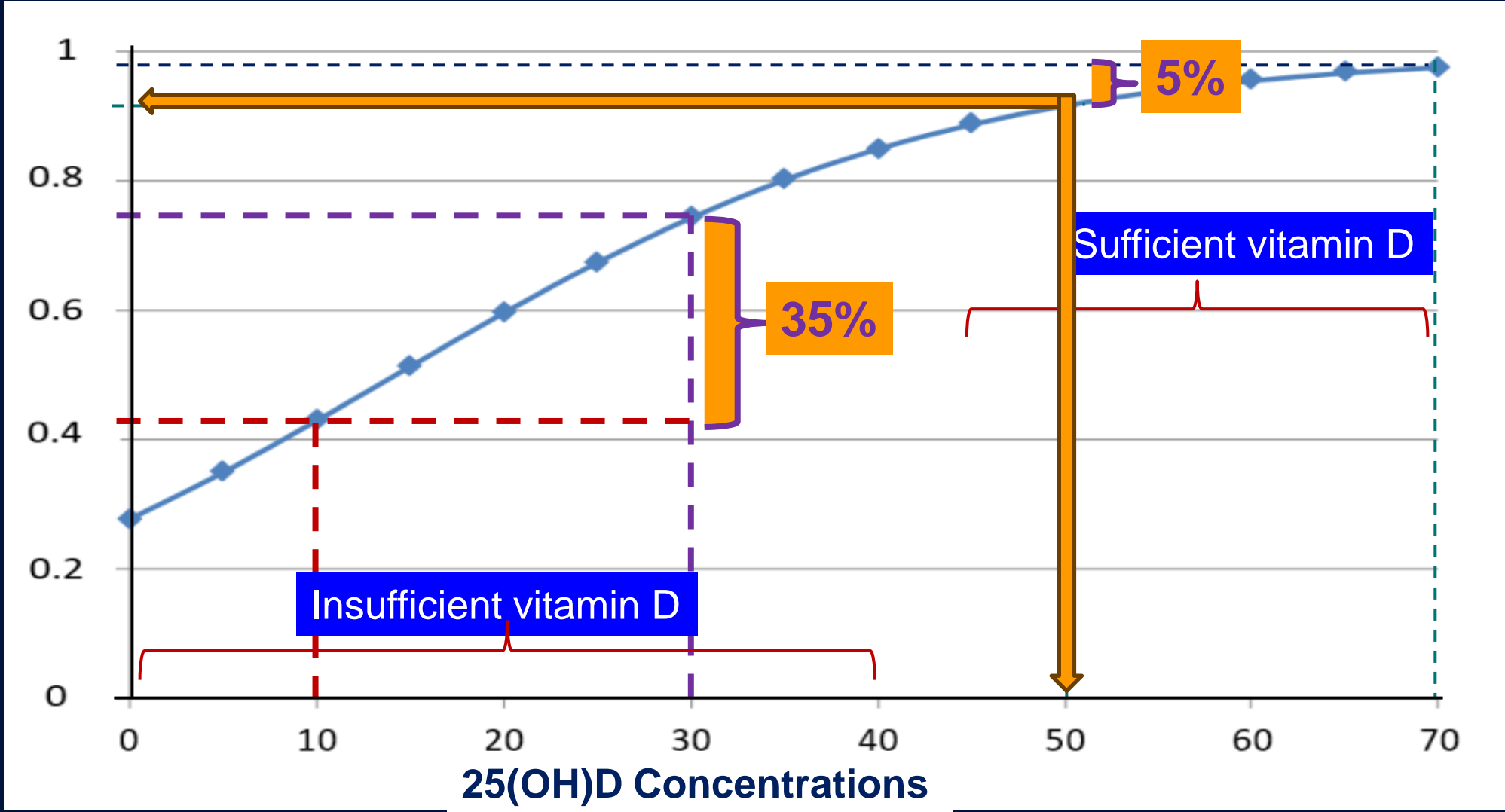
- **Innate Immunity**—Maintain circulatory 25(OH)D above 50 ng/mL (125 nmol/L):
It stimulates all immune cells (e.g., production of antimicrobial peptides, etc).
- **Adaptive Immunity**—Vitamin D stimulates cellular immunity: secreting neutralising antibodies and keep the memory cells alert.

**Relationship Between
Serum 25(OH)D
Concentration With
SARS-CoV-2 Infection
(PCR Positivity) and Deaths**

COVID-19 PCR Positivity & Vitamin D (192,000 people)



Probability of survival from SARS-CoV-2 infection

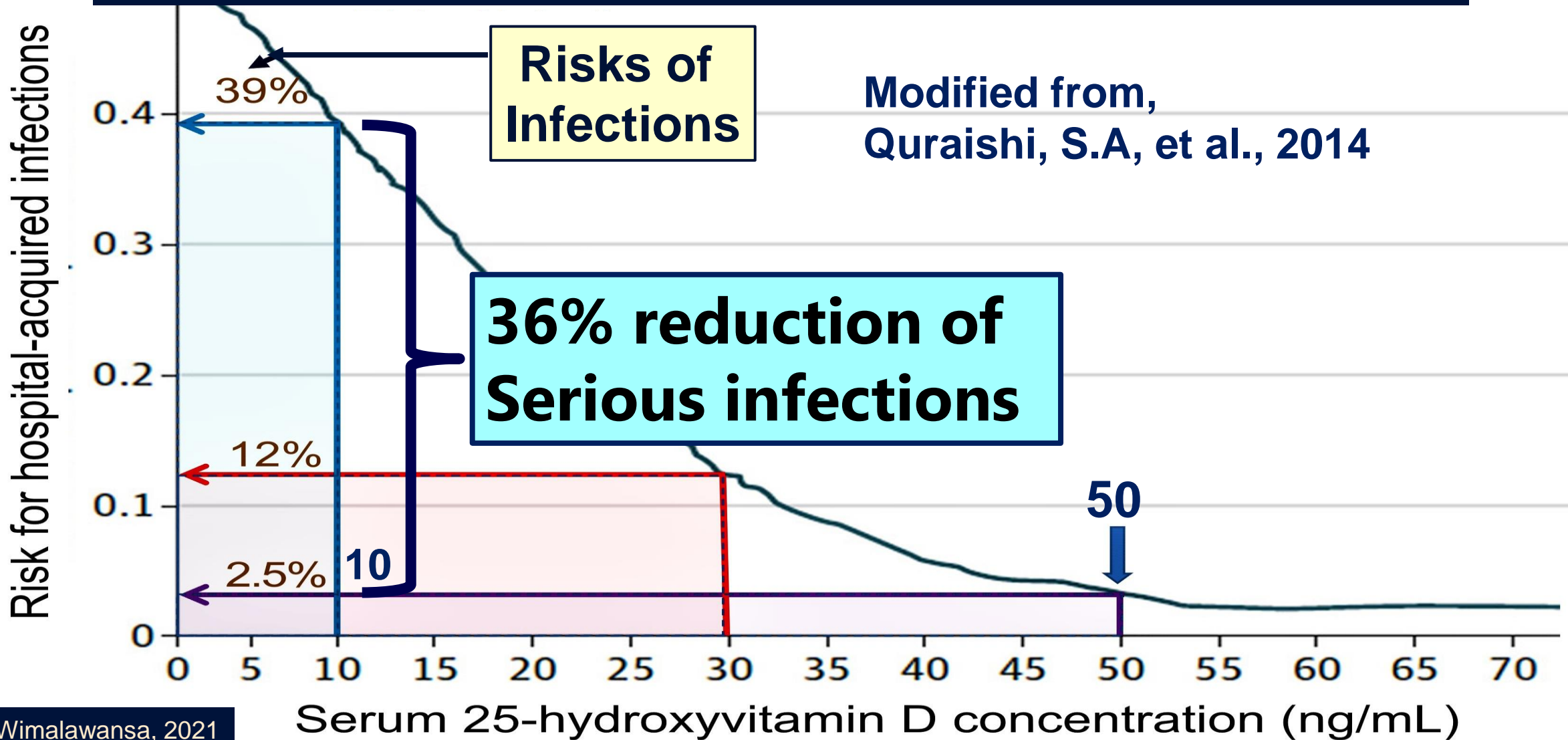


Samaha J, et al, Nutrients, 2023. 10.3390/nu15051132 <https://www.mdpi.com/2072-6643/15/5/1132>
Survival curve—vitamin D concentrations—2021 and 2022 winter period in Slovakia.
Relationship between serum 25(OH)D upon hospital admission and mortality for the whole cohort of hospitalized patients with COVID-19 pneumonia . An increase in serum 25(OH)D concentration of one ng/mL leads to approximately a 7% increase in the chance of survival

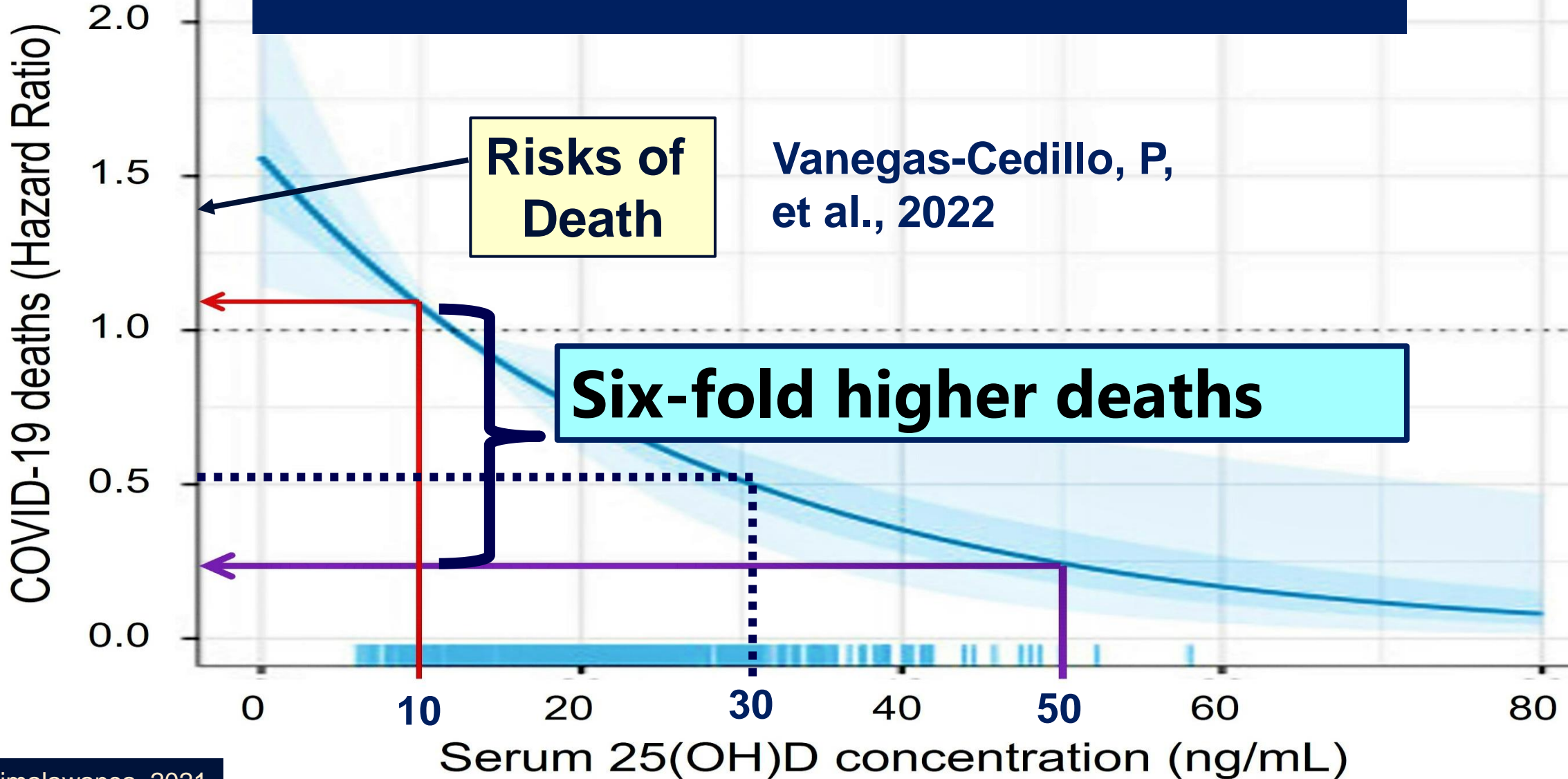
Beneficial Effects of Vitamin D

**Preventing COVID and its
Complications and Deaths**

Risk of Hospital-Acquired Infections Based on Pre-operative Vitamin D Levels



Low Vitamin D, Drive Deaths from COVID-19 and Other infections



Risks of Death

Vanegas-Cedillo, P, et al., 2022

Six-fold higher deaths

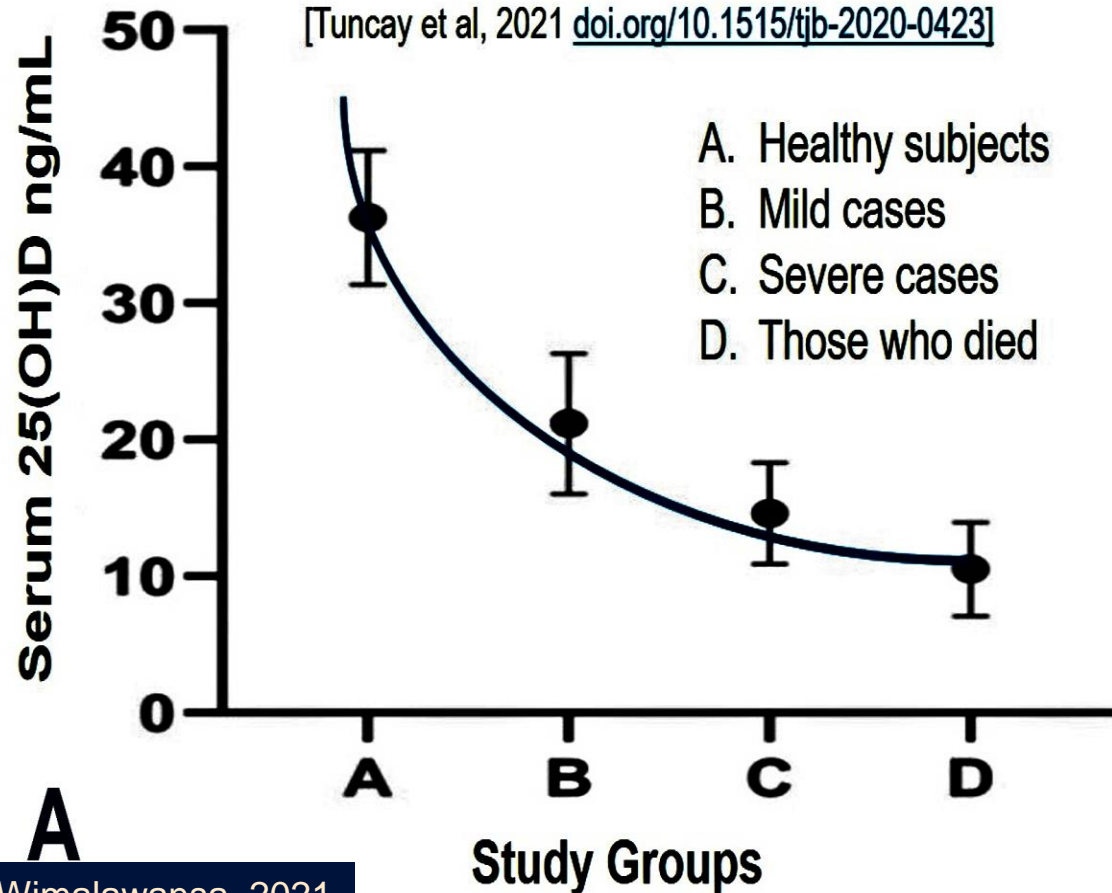
Calcifediol–Clinical Outcomes

[Wimalawansa & Polonowita, 2021
Boosting immunity with vitamin D
NSF, pp. 171-198, Vol. I, 2021]

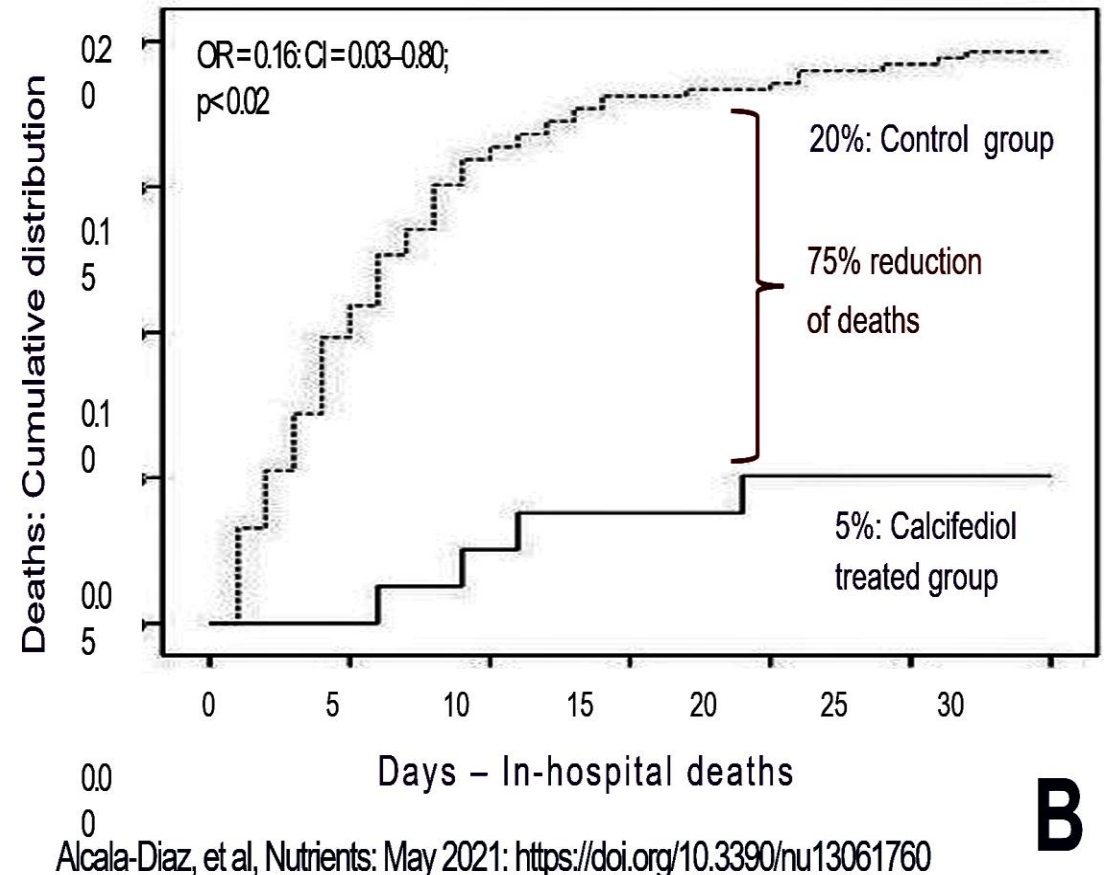
A (Tuncay, et al) and B (Alcaka-Diaz et al, 2021)

25(OH)D status and clinical outcomes

[Tuncay et al, 2021 doi.org/10.1515/tjb-2020-0423]



Effects of calcifediol in COVID-19-related deaths



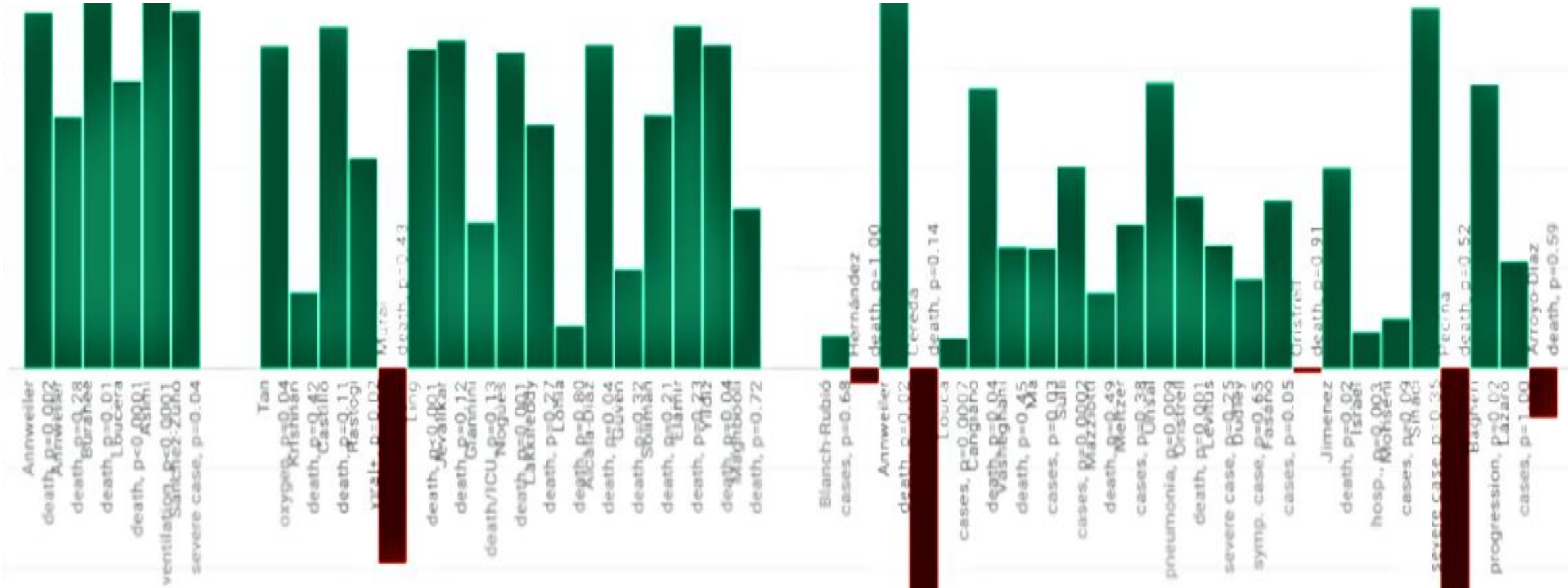
Vitamin D for COVID-19: Real-time meta-analysis of 130 studies in 93,646 subjects

Increased Risks (%) Lower Risks (%)

Early treatment

Late treatment

Preventative use

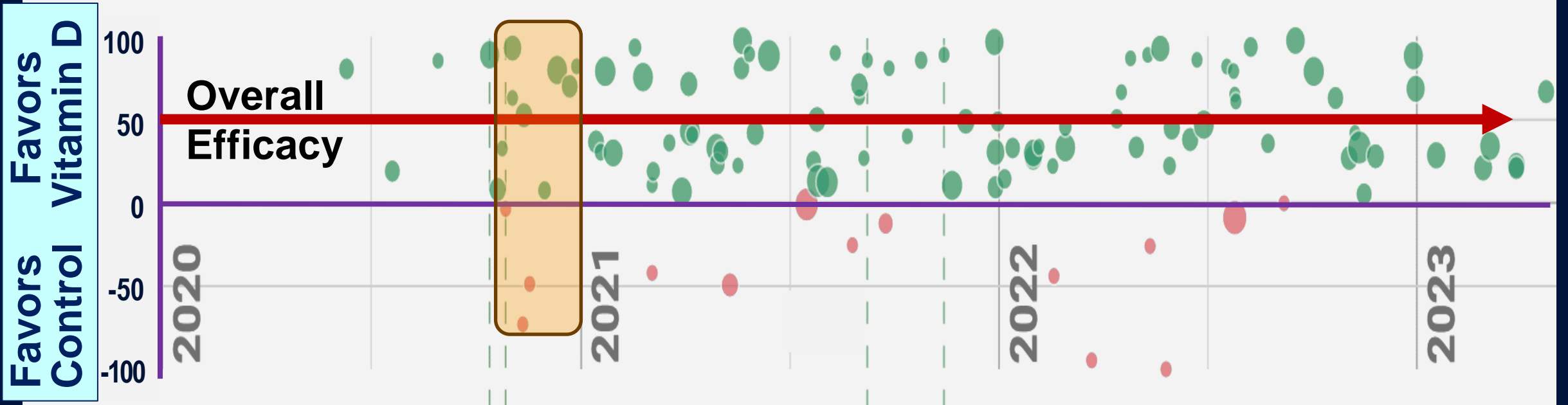


[Vitamin D for COVID-19: real-time meta-analysis of 140 studies \(vdm-meta.com\)](http://vdm-meta.com)

Efficacy of Vitamin D in Controlling SARS-CoV-2

Timeline of COVID-19 vitamin D treatment studies (pooled effects)

c19early.org/d Jul 2023



Favors
Control
Vitamin D

Vitamin D for COVID-19: real-time meta-analysis of 290 studies (111 treatment studies and 179 sufficiency studies):
www.C19early.org.D

October 2020: efficacy (pooled outcomes)

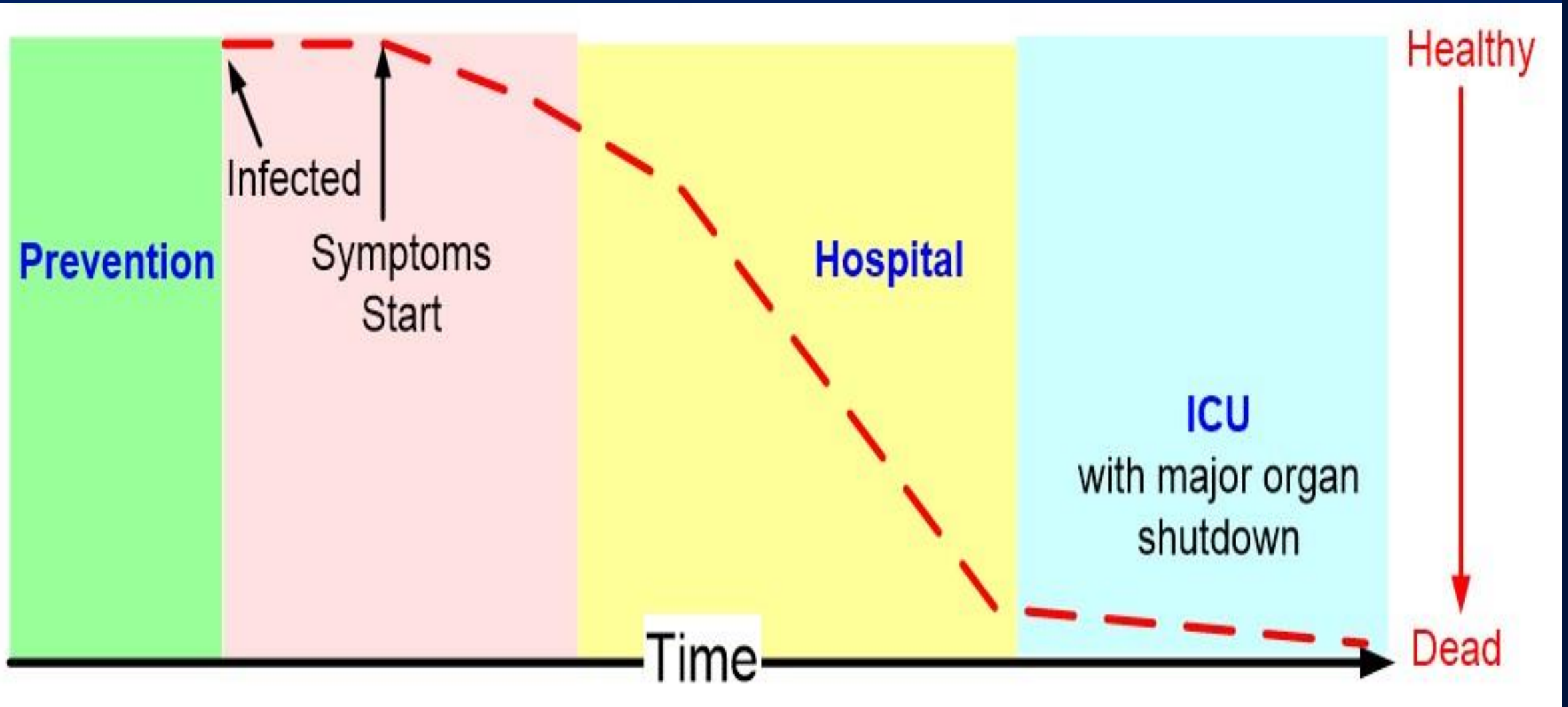
October 2020: efficacy (specific outcome)

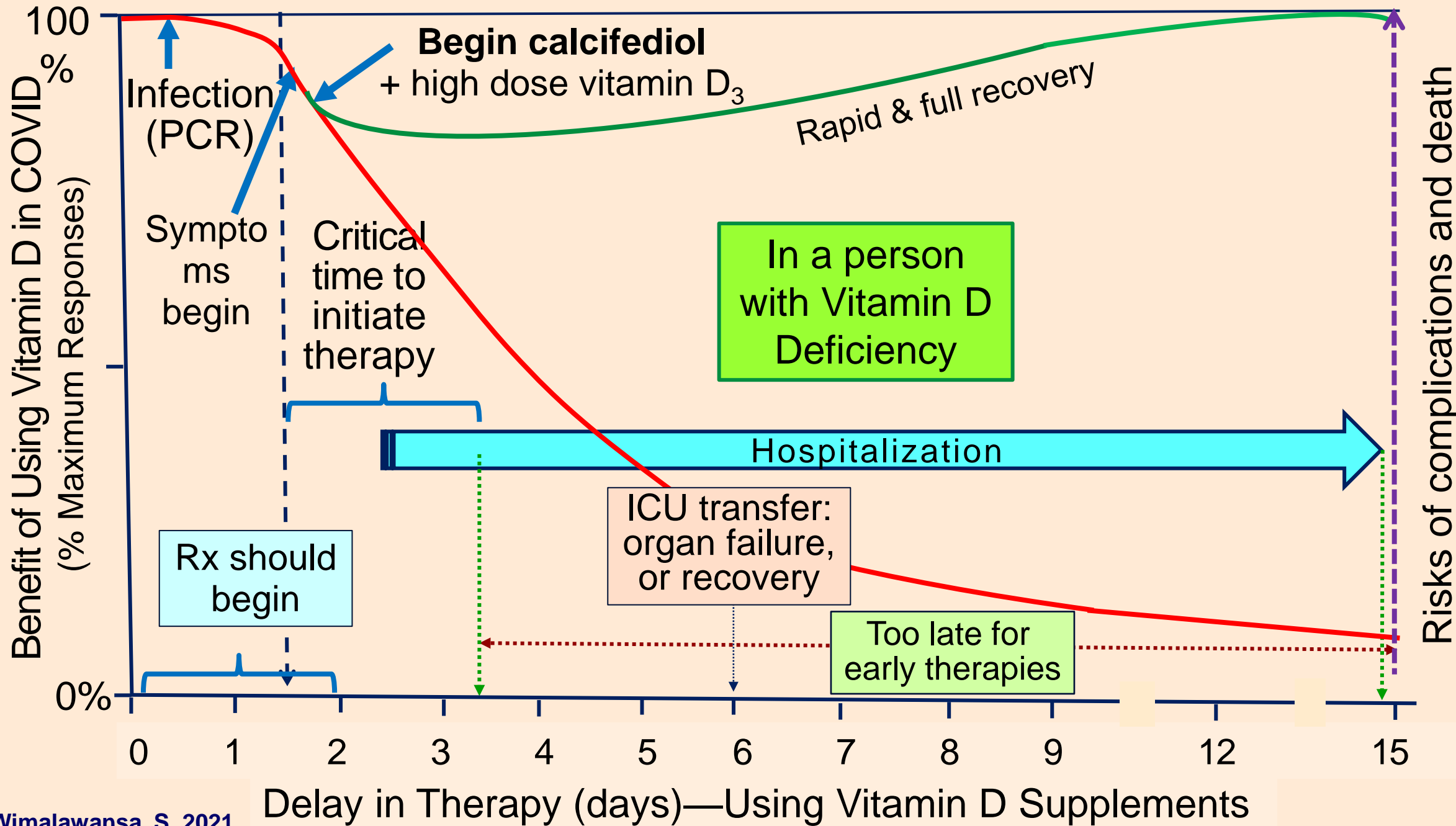
September 2021: efficacy (RCT pooled)

November 2021: efficacy (RCT specific)

From Vitamin D Wiki.com

Simplified Version—Time vs. Response—Early Therapies

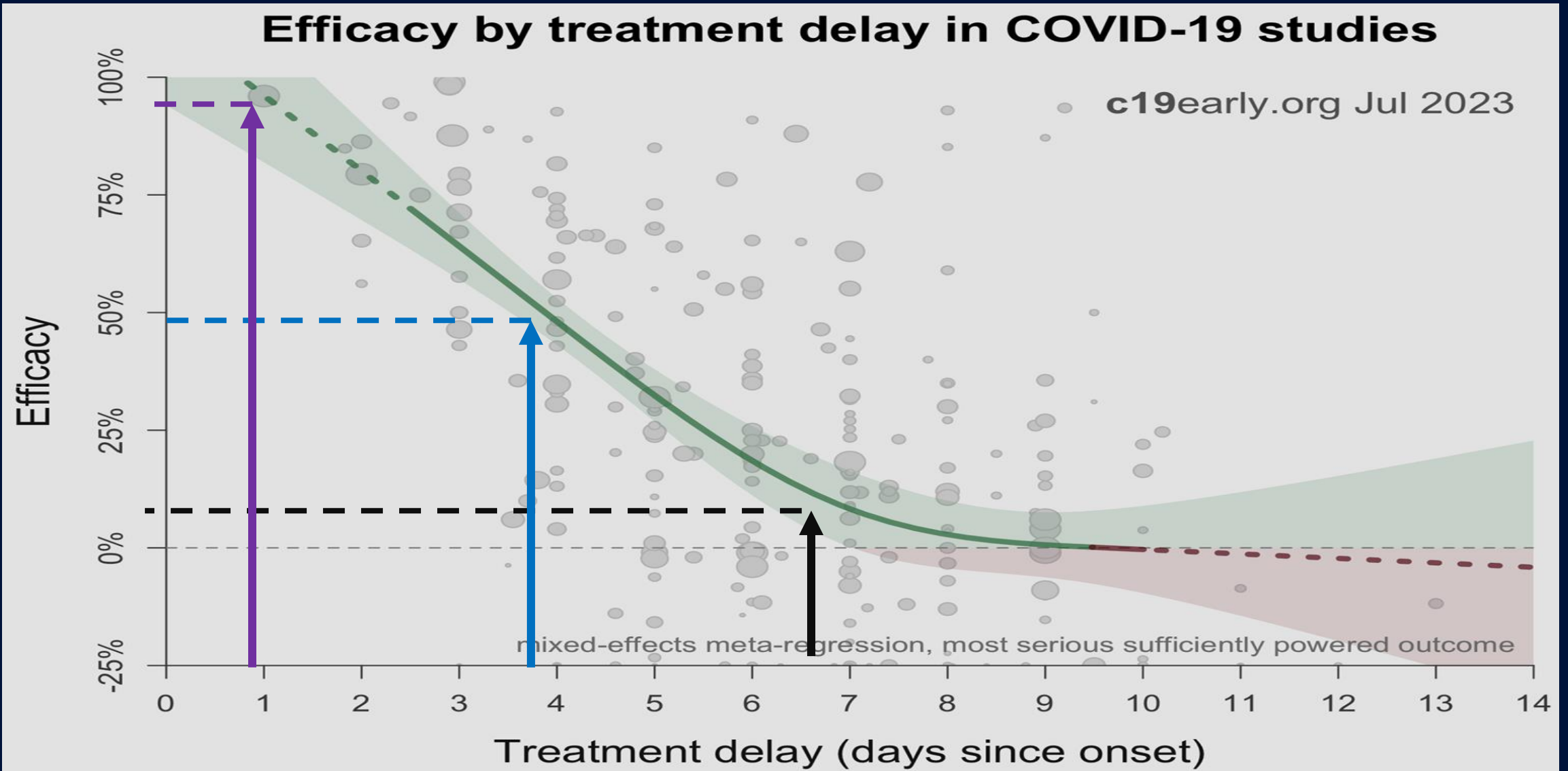




Vitamin D Saves Lives in Persons With COVID-19

- Most people with COVID-19 related complications and recovered or died, had **severe vitamin D deficiency** that compromised their immune systems.
- Therefore, it is logical to provide what is lacking in these vulnerable people: **Vitamin D**

Early Treatment is More Effective



Lessons Learned—Past Three Years

Wimalawansa, 2022

“COVID-19 and Serum 25(OH)D”

- A strong inverse relationship between serum 25(OH)D concentration with risk, severity, and death from COVID-19
- **In general:** Outcomes based on serum 25(OH)D:
 - Asymptomatic disease: > 50 ng/mL
 - Mild disease: 30 to 40 ng/mL
 - Moderate disease: 20 to 30 ng/mL
 - Severe disease: < 20 ng/mL; Death: <10 ng/mL

Ways to Naturally Boost the Immune System

Quickest Way to Boost the Immune System

- **Calcifediol 0.5 to 1.0 mg (NOT calcitriol) on admission (dose: 0.014 mg/kg Body weight)**
- **It acts within 4 hours (no need to measure 25(OH)D and boost the immune system)**
- **It will maintain serum 25(OH)D levels >50 ng/mL at least for a week (so a vitamin D loading dose is importance).**

Best Way to Rapidly Boost the Immune System

- ✓ Combined “Calcifediol and Vitamin D” on admission or earliest sign of an infection (i.e., PCR positive).
- ✓ This will save lives, prevent the need of hospitalization & ICU use.

Modified by,
Robin Whittle

Easy Way to Calculate the Right Dose of Vitamin D

- **Not obese — 70 to 90 IU/ Kg body-weight, vitamin D₃ per day per**
- **Obesity I and II (BMI 30 to 39) — 100 to 130 IU/ Kg body-weight, vitamin D₃**
- **Obesity III (BMI 40 and above) — 140 to 180 IU Kg body-weight, vitamin D₃.**

Wimalawansa, S.J. Rapidly Increasing Serum 25(OH)D Boosts the Immune System, against Infections—Sepsis and COVID-19. *Nutrients*, 14(14), 2997, 2022

<https://doi.org/10.3390/nu14142997> Text: <https://www.mdpi.com/2072-6643/14/14/2997/htm>

An Example: Cost –Effective Comparison

- **Molnupiravir (Merck) and Paxlovid (Pfizer):**
 - **Cost of treatment per patient ~\$700 (USD)**
 - **Effectiveness: 50% in preventing hospitalisation**
- **Vitamin D or ivermectin:**
 - **Cost = Two dollars (\$2 /patient)**
 - **Effectiveness: ~75% prevent hospitalization**

Basics Regarding Medications

- **Early therapy is the best option**
- **Effectiveness of some generic agents are same or better effective than patented drugs**
- **Rarely, there is one treatment for one disease**
- **Not everyone respond to one medication, dose, or the same therapy—adjustments are necessary**
- ✓ **Therefore, people should be provided with choices.**

Vitamin D is a Cost-Effective Additional Therapy for Infections, like SARS-CoV-2

- **Vitamin D should not be used alone: It must be administered in addition to standard anti-microbial therapies (a key adjunct therapy)**
- **With First Line Medications and other micronutrients, vitamin D boosts the immune system, allowing patients to recover faster**

Summary

Wimalawansa, 2021

- **A strong, inverse association of serum 25(OH)D concentrations & COVID-19 severity**
- **Better the vitamin D status, lower the risks of complications from COVID-19**
- **Taking >5,000 IU/day will maintain a healthy levels of serum 25(OH)D to maintain robust immunity**
- **In emergencies, a loading dose between 100,000 and 400,000 IU needed to rapidly boost immunity.**



Truth and Evolving Science

- **Science is continually changing**
- **Truth will not change — it needs to be realized**
- **Not accepting and fighting against the truth (and nature) is fruitless and painful**
- **Truth will eventually prevail**
- **It will then change others**

Vitamin D — Summary

- Prevention is MUCH better than treatment
- Apart from the musculoskeletal system, vitamin D benefits all systems in the body
- The cost-benefit of vitamin D, exceeds of 1 :1000
- Preventing disease with micronutrient sufficiency, especially with vitamin D, is highly cost-effective and is the way to reduce disease burden and healthcare costs.

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<https://wimalawansa.org>

Some of our recent philanthropic
contributions:

https://wimalawansa.org/community_projects

Our recent charitable work:

<https://www.facebook.com/pg/WimalawansaFoundation.PreventingCKDmfo/posts/>

suniljw@hotmail.com



**WIMALAWANSA
FOUNDATION**
Opening Doors for Healthier Life