# Increased Prevalence of Dementia and Neurological Diseases in SARS-CoV-2 Infection Survivors


## Adnan I Qureshi MD

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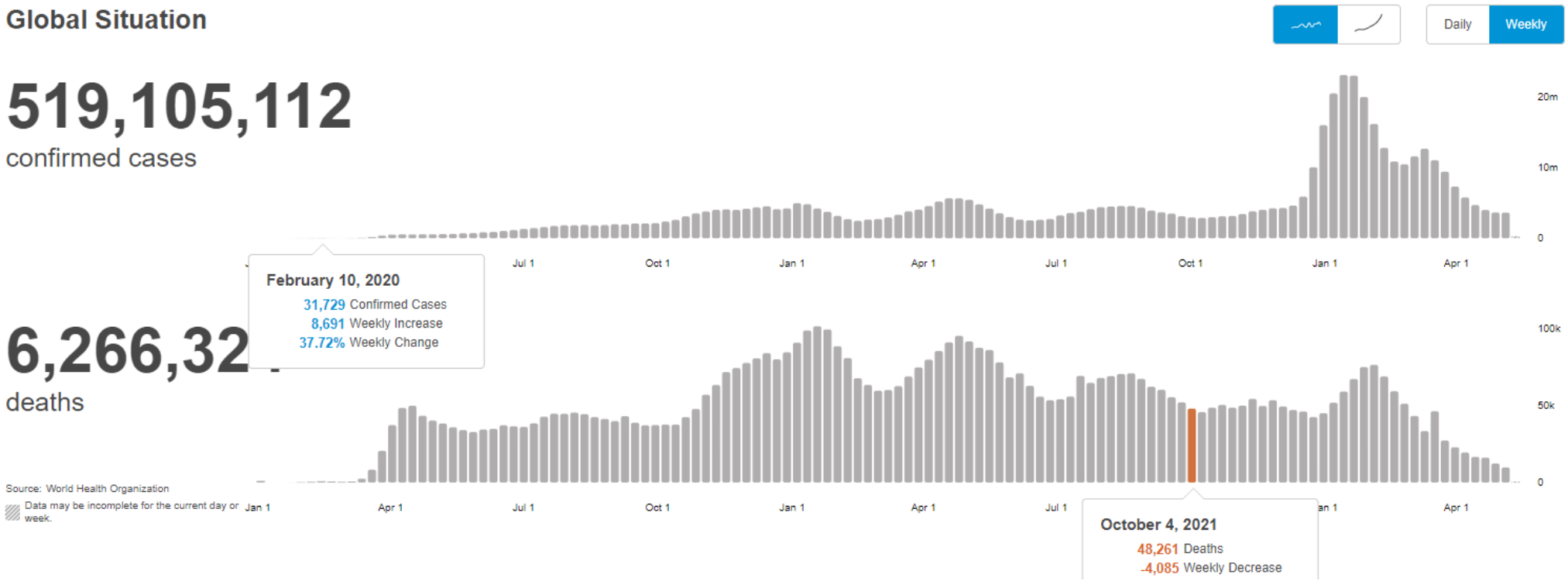
# Acute Ischemic Stroke and Coronavirus Disease 2019: An Analysis of 27,676 Patients

- 8,163 patients with confirmed COVID-19 among 27,676 patients in the Cerner de-identified COVID-19 dataset.
- 103 (1.3%) patients developed acute ischemic stroke among 8,163 patients with COVID-19.
- 199 (1.0%) patients developed acute ischemic stroke among 19,513 patents in whom COVID-19 was excluded.
- Of the 103 patients with confirmed COVID-19 and acute ischemic stroke, 94 received their COVID-19 diagnosis during the same encounter that they had acute ischemic stroke.

*Qureshi AI.* Stroke. 2021;52:905–912

# Survivors of SARS-CoV-2 infection

- **New focus on long-term disability among approximately 513 million survivors worldwide.**



# How many survivors of SARS-CoV-2 infection are present in USA

- ❑ 20 million
- ❑ 40 million
- ❑ 80 million
- ❑ 160 million

# Survivors of SARS-CoV-2 infection

- **New focus on long-term disability among approximately 80 million survivors in USA.**

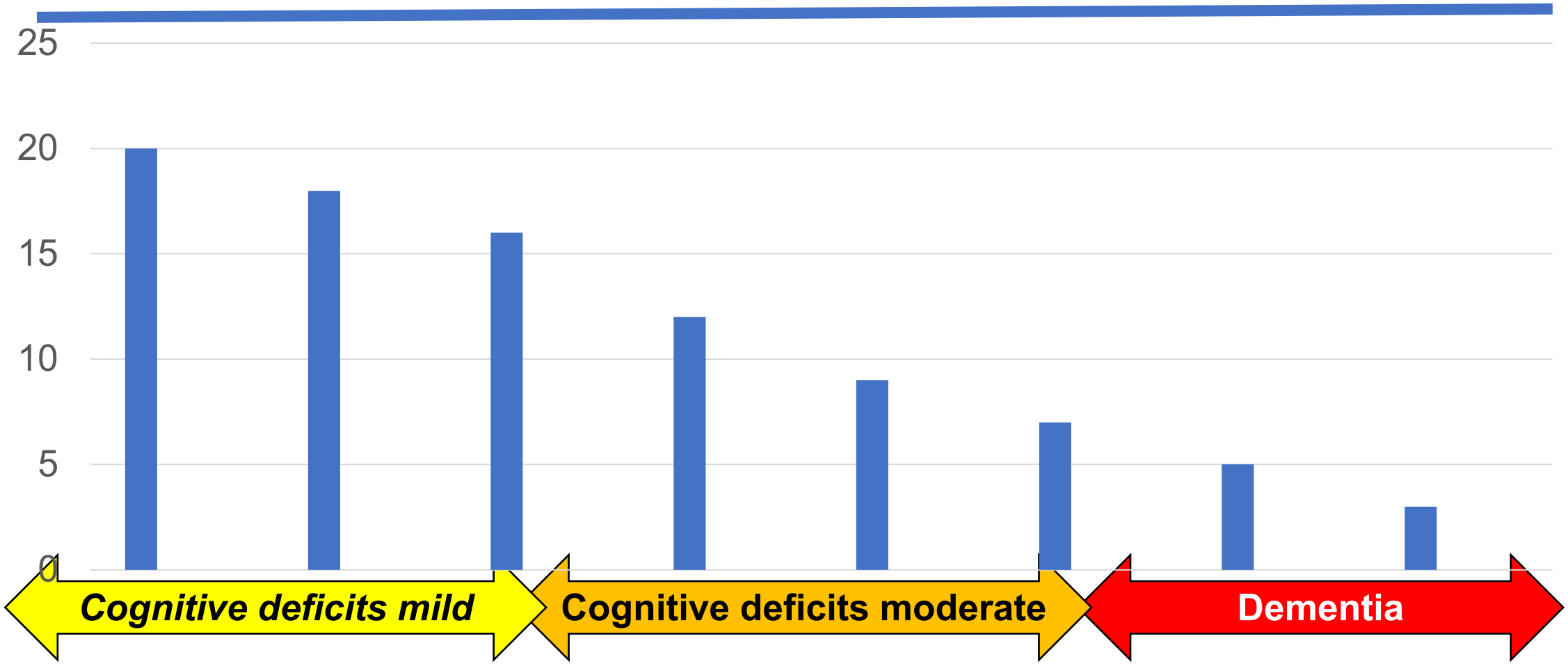
# Cognitive Impairment Among Survivors of SARS-CoV-2 infection

| Study | Patients | Definition of cognitive impairment | Prevalence |
|---|---|---|---|
| Hellmuth et al. | 100 non-hospitalized | Detailed neuropsychological testing which revealed mild disorganization and inefficient, error-prone task execution. | 20 (20%) |
| Taquet et al. | 236,379 hospitalized | Dementia by ICD-10 codes | 6229 (2.6%) |

Hellmuth J. J Neurovirol 2021; 27(1): 191-5.

Taquet M. Lancet Psychiatry 2021; 8(5): 416-27.

# Cognitive Impairment Among Survivors of SARS-CoV-2 infection




Hellmuth J. J Neurovirol 2021; 27(1): 191-5.

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# What kind of cognitive deficits do survivors of SARS-CoV-2 infection have:

- ❑ Mild cognitive deficits that may or may not be detected by MMSE or MoCA
- ❑ Severe cognitive deficits
- ❑ Dementia that impairs multiple cognitive and functional domains
- ❑ 2 and 3
- ❑ 1,2, and 3

# Cognitive Impairment Among Survivors of SARS-CoV-2 infection

- **The prevalence and risk of dementia in survivors of SARS-CoV-2 infection has multiple implications for screening, post recovery care and resources, care-giver burden, and financial and productivity loss.**

- **The impact on public health may be much larger than the acute manifestations of SARS-CoV-2 infection due to lifelong burden of dementia.**

***Re: Qureshi AI, Baskett WI, Huang W, Naqvi SH, Shyu CR. Open Forum Infectious Diseases. 2022 Apr;9(4):ofac115***

# Cognitive Impairment Among Survivors of SARS-CoV-2 infection

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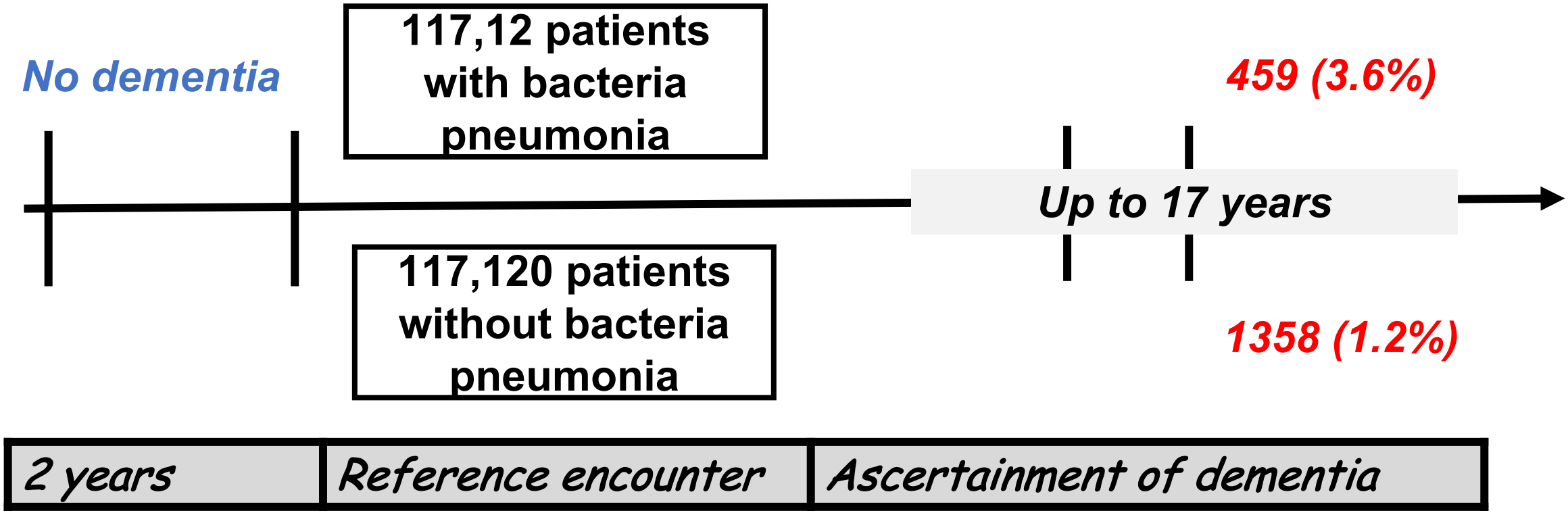
***Re: Qureshi AI, Baskett WI, Huang W, Naqvi SH, Shyu CR. Open Forum Infectious Diseases. 2022 Apr;9(4):ofac115***

# New Onset Dementia Among Survivors of Bacterial Pneumonia



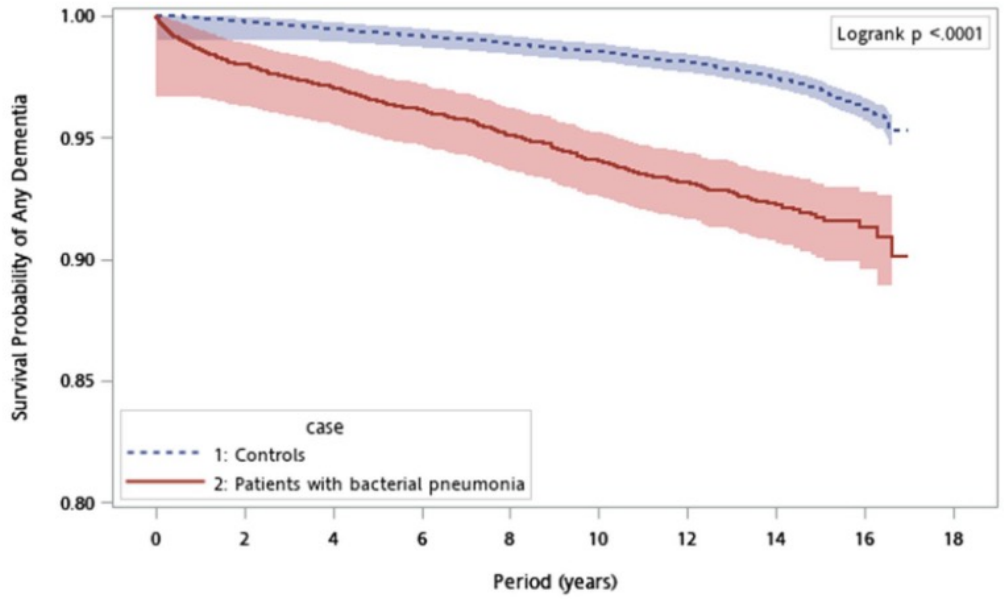

*Re: Che-Sheng Chu, et al. Brain, Behavior, and Immunity, Volume 103, 2022, Pages 12-18.*

# New Onset Dementia Among Survivors of Bacterial Pneumonia

*No dementia*

**117,12 patients with bacteria pneumonia**

**117,120 patients without bacteria pneumonia**




| *2 years* | *Reference encounter* | *Ascertainment of dementia* |
|---|---|---|

*Re: Che-Sheng Chu, et al. Brain, Behavior, and Immunity, Volume 103, 2022, Pages 12-18.*

# New Onset Dementia Among Survivors of Pneumonia Associated with Severe Acute Respiratory Syndrome Coronavirus 2 Infection

- Cerner Real-World Data extracted from the electronic medical records of health care facilities.

- The Cerner Real-World Data is available through Cerner Corporation. The Cerner Real World Data Q3 2021 through July 2021 collected from 110 contributing Cerner Real-World Data health systems.

HCRJ | HealthCare Research Journal
OFFICIAL JOURNAL OF ZEENAT QURESHI INSTITUTES

**Facilitating the Study of Relationships between COVID-19 and Cardiovascular Health Outcomes Using Cerner Real-World COVID-19 Deidentified Dataset**

Adnan I Qureshi MD*[,1], William I. Baskett BS[2], Wei Huang MA[1], Daniel Shyu MD[3], Danny Myers PhD[4], Murugesan Raju PhD[2], Iryna Lobanova MD[1], M. Fareed K. Suri MD[5], S. Hasan Naqvi MD[6], Chi-Ren Shyu PhD[2]

[1]*Department of Neurology, University of Missouri, MO, USA*
[2]*Institute for Data Science and Informatics, University of Missouri, MO, USA*
[3]*School of Medicine, University of Missouri, MO, USA*
[4]*Tiger Institute for Health Innovation, Cerner Corporation, MO, USA*
[5]*St. Cloud Hospital, St. Cloud, MN, USA*
[6]*Department of Internal Medicine, University of Missouri, Columbia, MO, USA*

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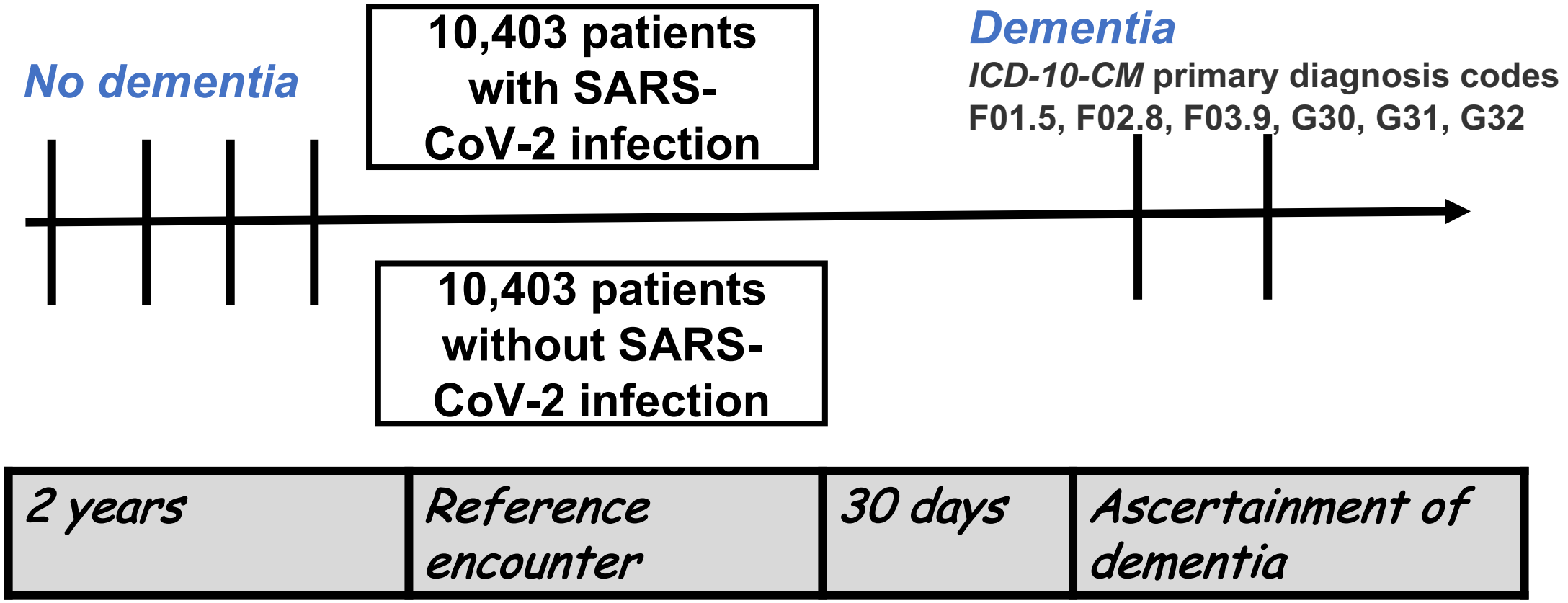


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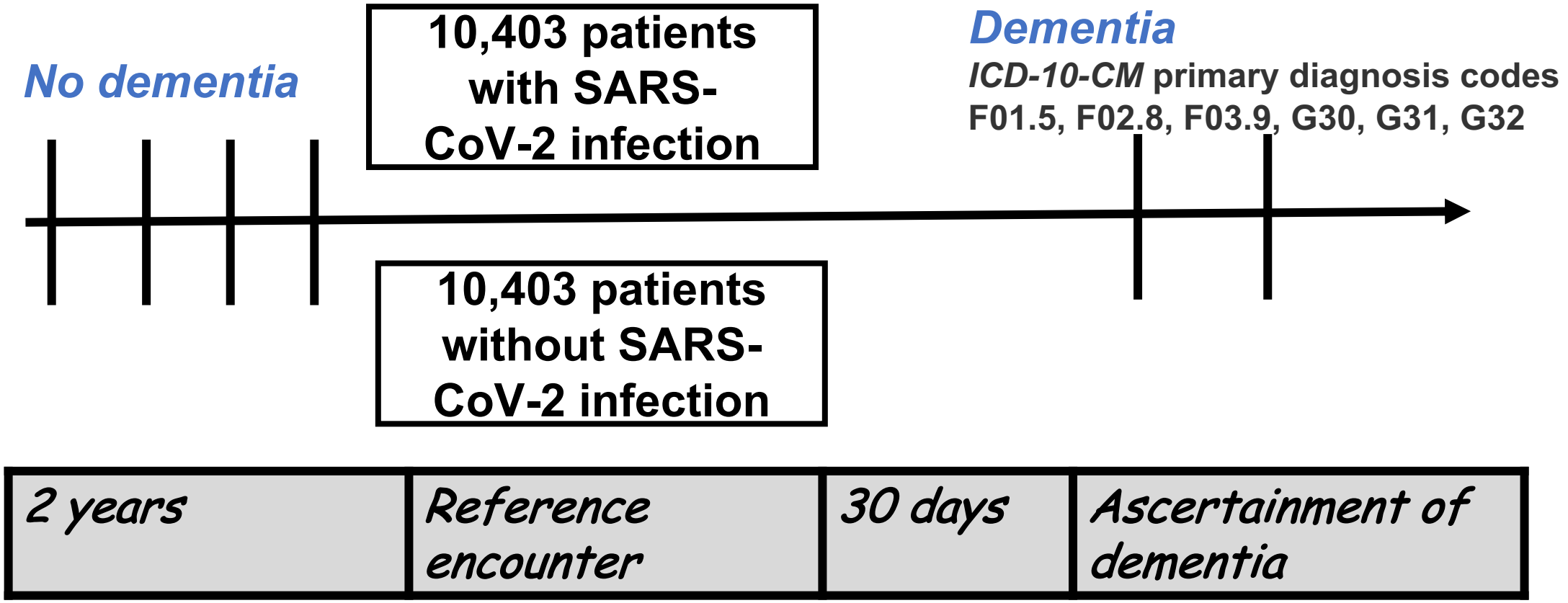


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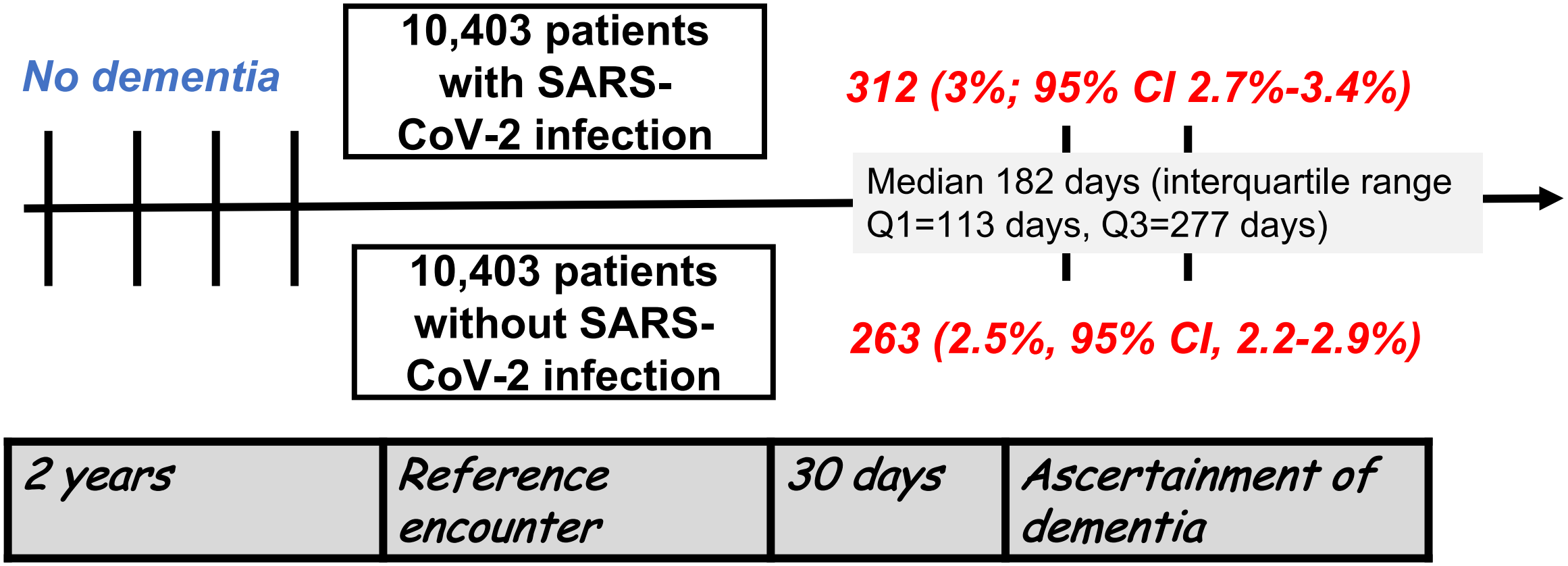


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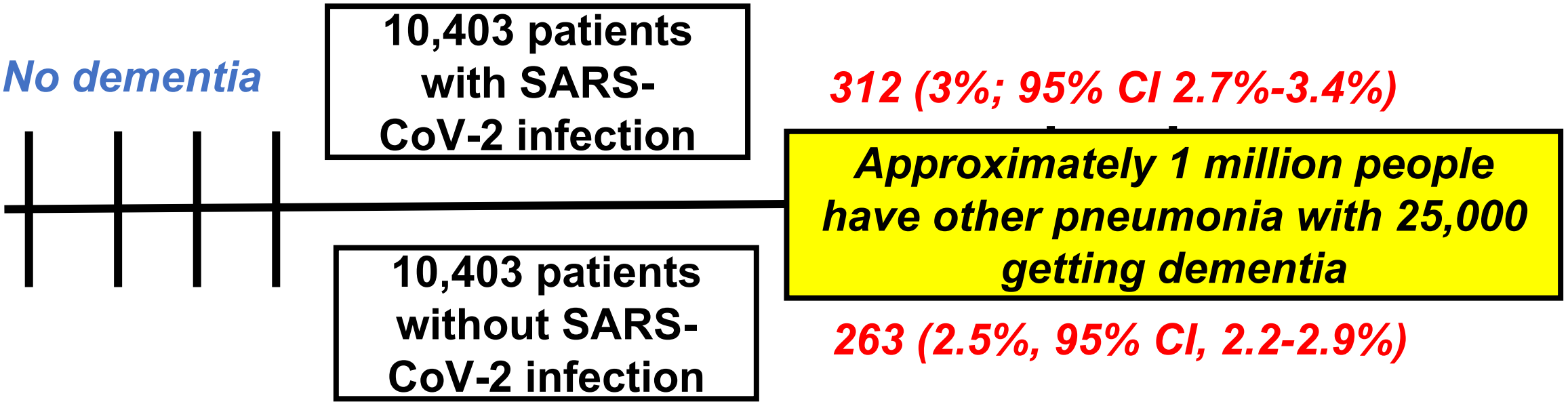


*Re:* American Thoracic Society 2019

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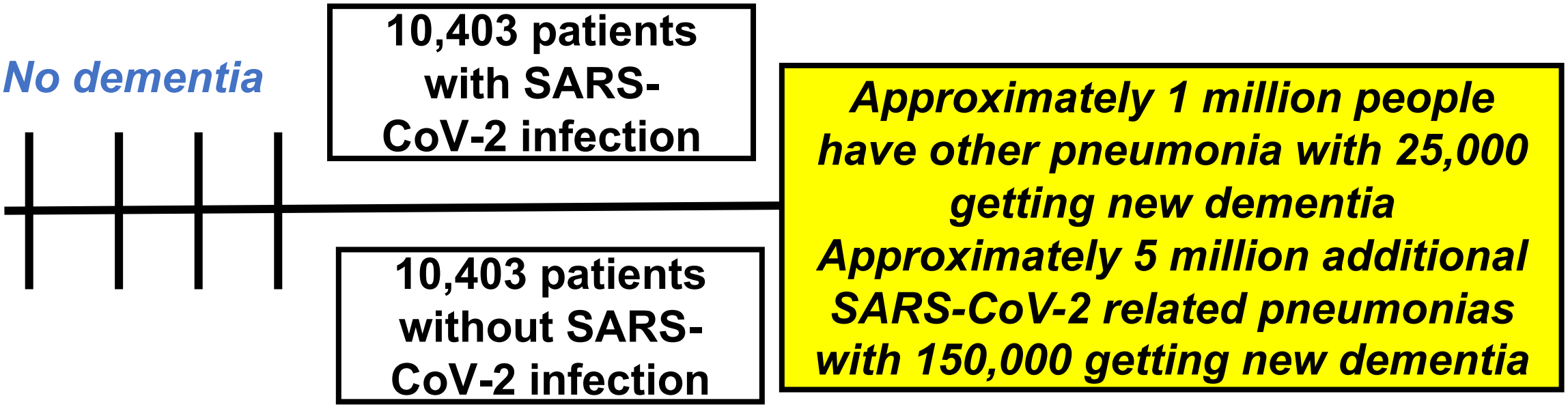


| 2 years | Reference encounter | 30 days | Ascertainment of dementia |
|---|---|---|---|

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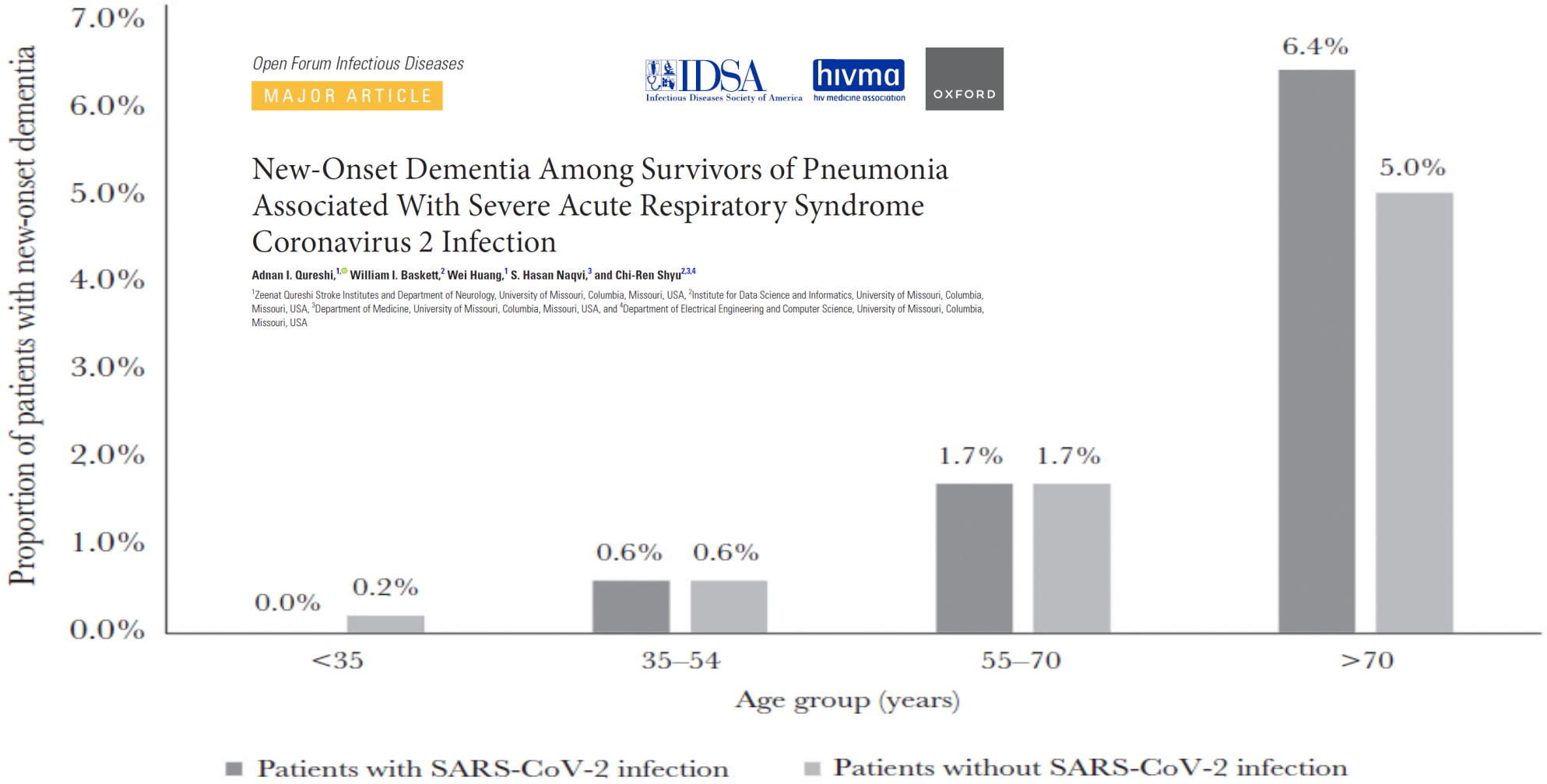
# New Onset Dementia Among Survivors of Pneumonia Associated with Severe Acute Respiratory Syndrome Coronavirus 2 Infection (by age groups)




*Open Forum Infectious Diseases*

MAJOR ARTICLE

IDSA Infectious Diseases Society of America · hivma hiv medicine association · OXFORD

New-Onset Dementia Among Survivors of Pneumonia Associated With Severe Acute Respiratory Syndrome Coronavirus 2 Infection


Adnan I. Qureshi,[1,©] William I. Baskett,[2] Wei Huang,[1] S. Hasan Naqvi,[3] and Chi-Ren Shyu[2,3,4]

[1]Zeenat Qureshi Stroke Institutes and Department of Neurology, University of Missouri, Columbia, Missouri, USA, [2]Institute for Data Science and Informatics, University of Missouri, Columbia, Missouri, USA, [3]Department of Medicine, University of Missouri, Columbia, Missouri, USA, and [4]Department of Electrical Engineering and Computer Science, University of Missouri, Columbia, Missouri, USA

# New Onset Dementia Among Survivors of Pneumonia Associated with Severe Acute Respiratory Syndrome Coronavirus 2 Infection (multivariate analyses)

| Predictors | Model 1[a] | Model 2[b] |
|---|---|---|
| | OR (95% CI) | OR (95% CI) |
| **Primary study predictor** | | |
| SARS-CoV-2 infection | 1.3(1.1-1.5) | 1.3(1.1-1.5) |

**Abbreviations used: SARS-CoV-2: severe acute respiratory syndrome coronavirus 2; OR: odds ratio; CI: confidence interval.**

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***Model 1. Baseline demographic characteristics+ cardiovascular risk factors +dementia risk factors.***
***Model 2. ++Septic shock, intubation/mechanical ventilation and stroke during reference encounter.***

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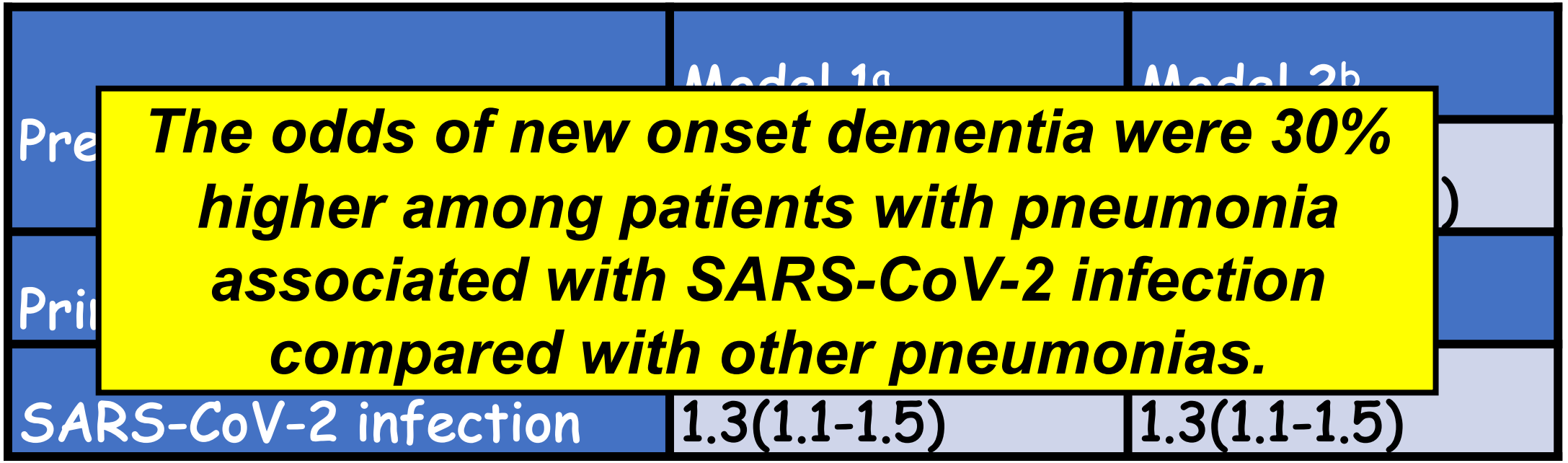


*Model 1. Baseline demographic characteristics+ cardiovascular risk factors +dementia risk factors.*
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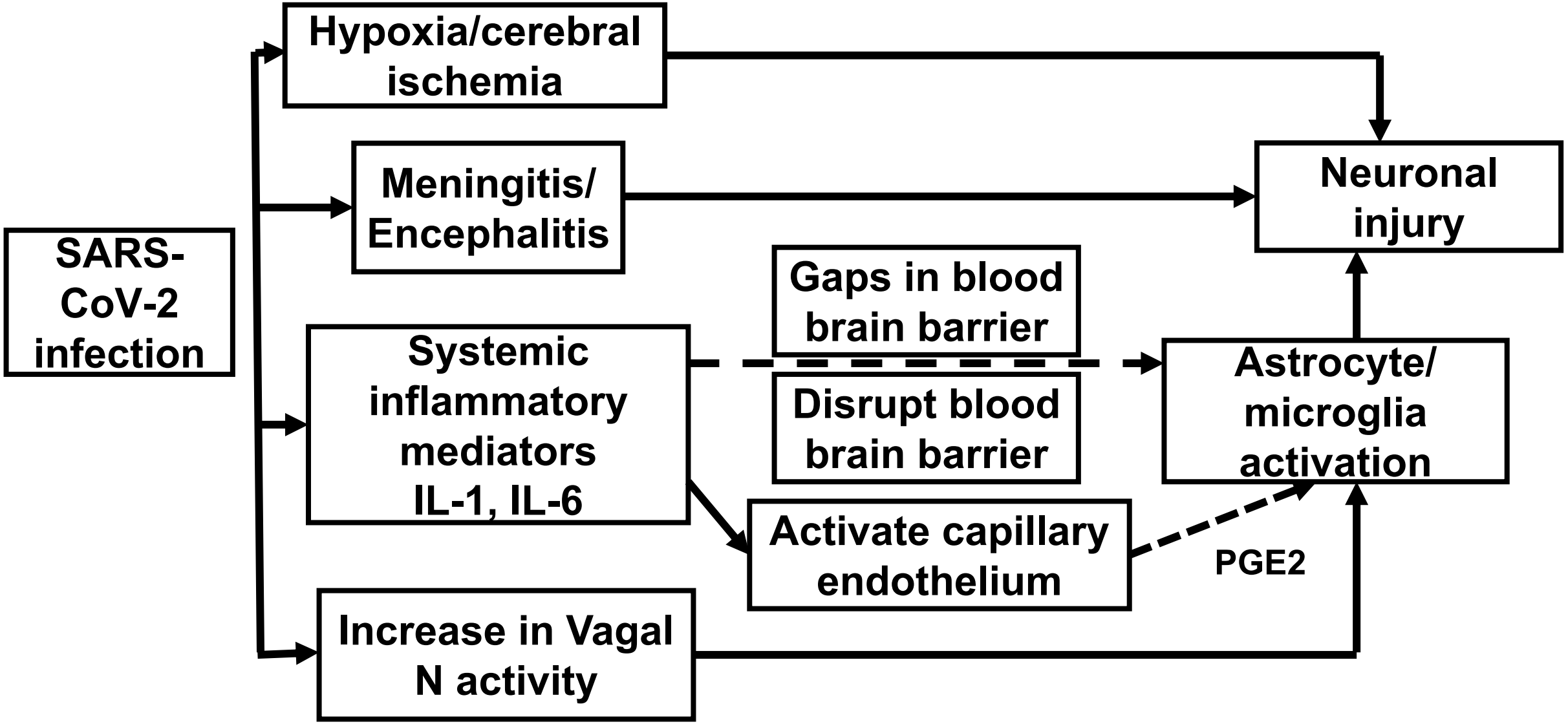
# Identify the true statements about pneumonia and dementia

- ❑ Survivors of bacteria pneumonia have a higher risk of dementia than those without pneumonia
- ❑ Survivors of SARS-CoV-2 related pneumonia have a higher risk of dementia than survivors of other pneumonia
- ❑ Survivors of SARS-CoV-2 related pneumonia have a higher risk of dementia due to higher risk of stroke

# Cognitive Impairment Among Survivors of SARS-CoV-2 infection-Pathophysiology



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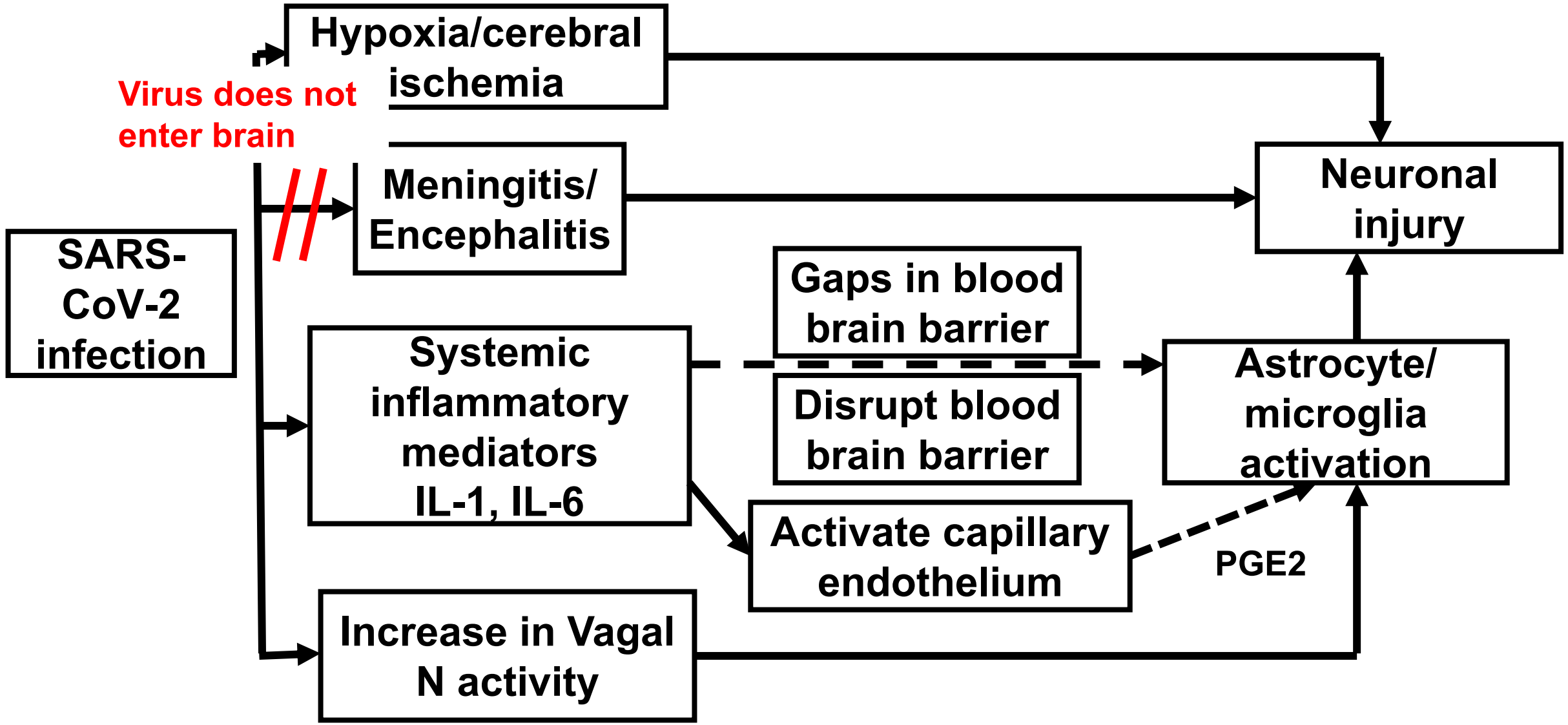

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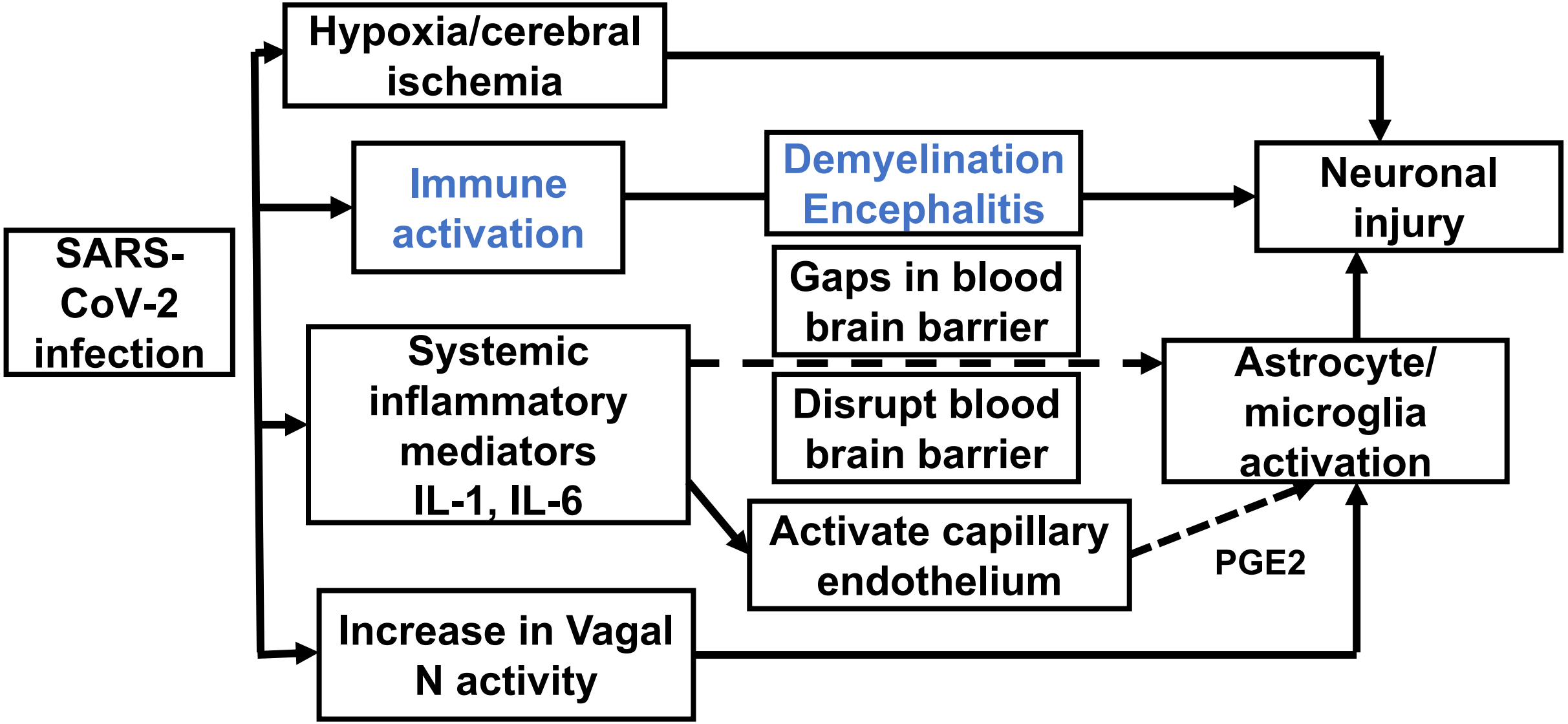
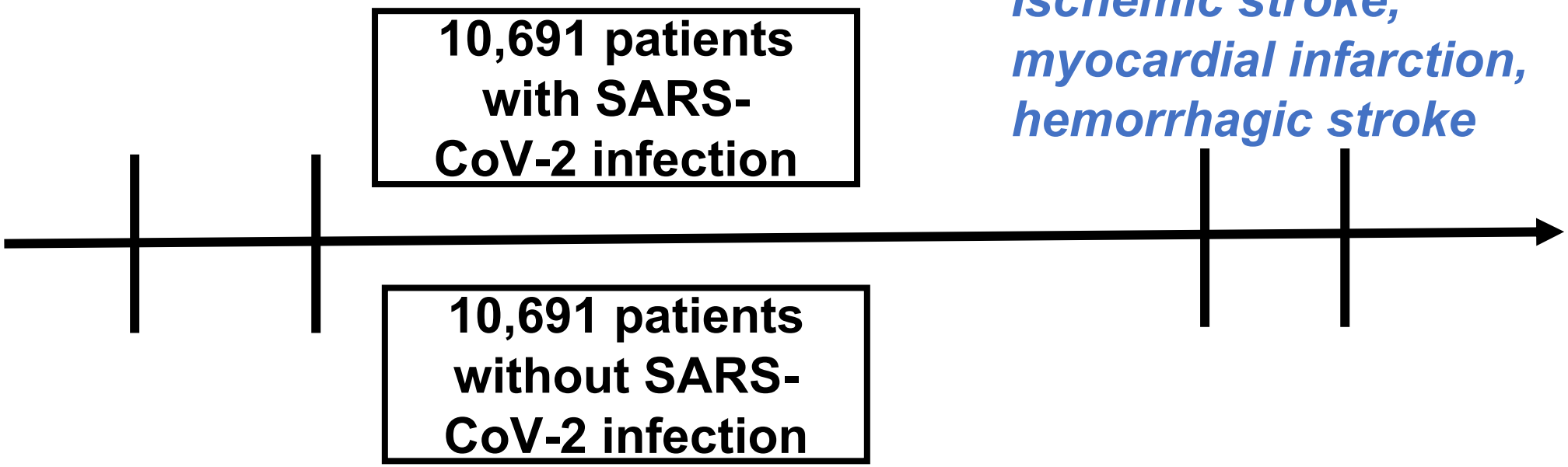
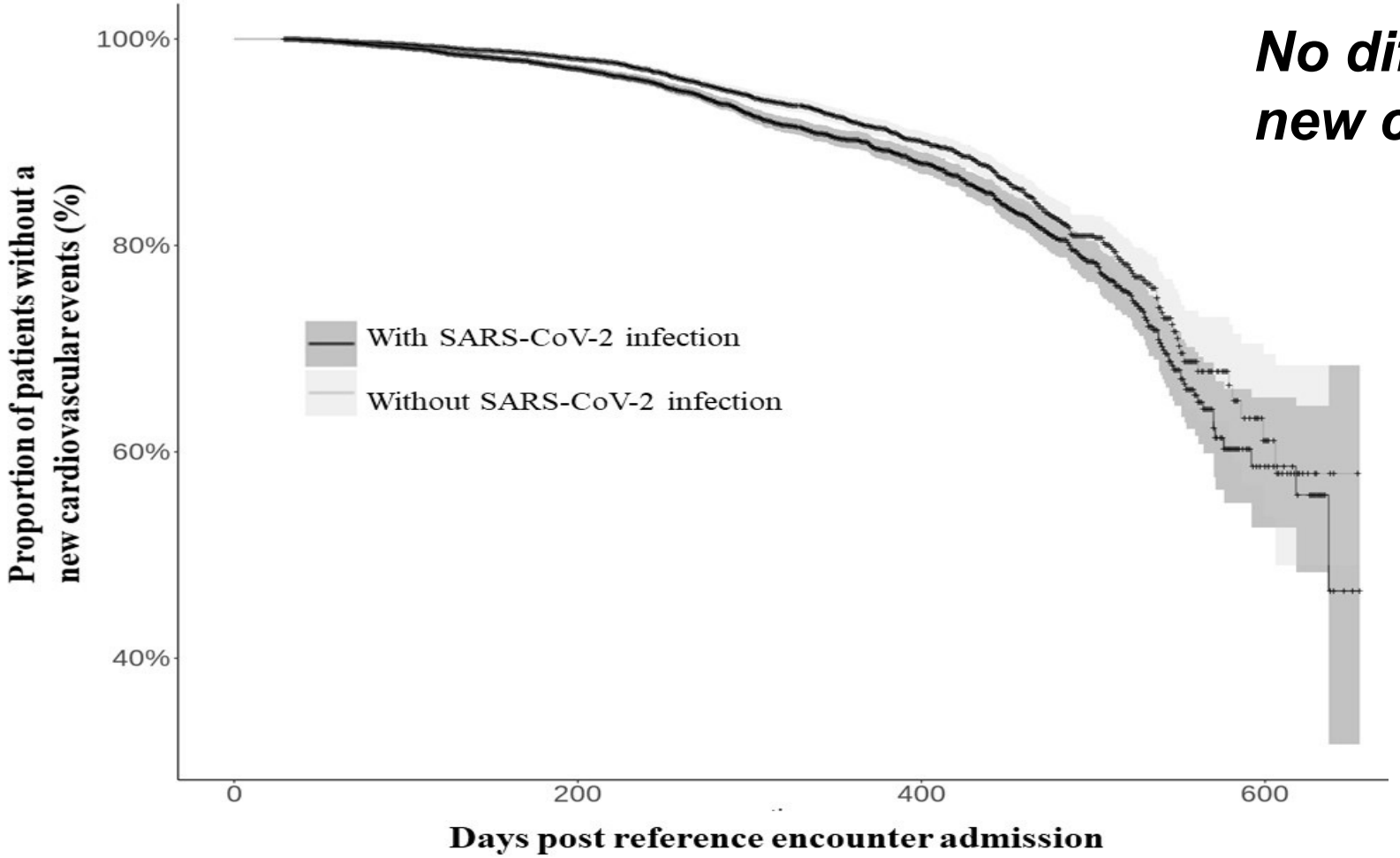


# New Cardiovascular Events Among Survivors of Pneumonia Associated with Severe Acute Respiratory Syndrome Coronavirus 2 Infection




| | | | |
|---|---|---|---|
| *2 years* | *Reference encounter* | *30 days* | *Ascertainment of new cardiovascular events* |

# New Cardiovascular Events Among Survivors of Pneumonia Associated with Severe Acute Respiratory Syndrome Coronavirus 2 Infection




***No difference in rate of new cardiovascular events***

# New Cardiovascular Events Among Survivors of Pneumonia Associated with Severe Acute Respiratory Syndrome Coronavirus 2 Infection-Guidelines

- **National Institutes of Health COVID-19 treatment guidelines**

**Anticoagulants and antiplatelet therapy should not be initiated for the prevention of venous thromboembolism or arterial thrombosis for non-hospitalized patients with SARS-CoV-2 infection, unless the patient has other indications for the therapy or is participating in a clinical trial (strong evidence based on expert opinion).**

- **Leentjens et al.**

**Routine antithrombotic treatment is not recommended in patients with SARS-CoV-2 infection after discharge based on pathophysiology of SARS-CoV-2 infection related coagulopathy and data from randomized controlled trials.**

Antithrombotic therapy in patients with COVID-19.

https://www.covid19treatmentguidelines.nih.gov/therapies/antithrombotic-therapy/. Updated February 11, 2021.

Leentjens J, Lancet Haematol. 2021;8(7):e524-e533.

# Cognitive Impairment Among Survivors of SARS-CoV-2 infection--Implications

- Occurrence of new onset dementia may increase the burden of disability among survivors of SARS-CoV-2 infection.
- US President----long-term symptoms of SARS-CoV-2 infection could be considered a disability under federal civil rights laws of Americans With Disabilities Act.
- National Institutes of Health research emphasizes on Long COVID can be debilitating and some people will require assistance with personal care months after the initial infection with 80% reporting difficulty in ability to work and 36% reported negative financial consequences.
- Social Security has released an emergency message giving its employees some guidance on how to handle applications that allege "post-COVID conditions."

# Long-COVID or Post-COVID conditions

Centers for Disease Control and Prevention
CDC 24/7: Saving Lives, Protecting People™

- *Dyspnea or increased respiratory effort*
- *Fatigue*
- *Post-exertional malaise and/or poor endurance*
- *"Brain fog," or cognitive impairment*
- *Cough*
- *Chest pain*
- *Headache*
- *Palpitations and/or tachycardia*
- *Arthralgia*
- *Myalgia*
- *Paresthesia*
- *Abdominal pain*
- *Diarrhea*
- *Insomnia and other sleep difficulties*
- *Fever*
- *Lightheadedness*
- *Impaired daily function and mobility*
- *Rash (e.g., urticaria)*
- *Mood changes*
- *Anosmia or dysgeusia*
- *Menstrual cycle irregularities*

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***Interim Guidance on Evaluating and Caring for Patients with Post-COVID Conditions***

**The U.S. Centers for Disease Control and Prevention recommends using the umbrella term "post-COVID conditions" for a wide range of signs and symptoms that occur 4 or more weeks after acute COVID-19 infection.**

***Standardized case definitions are still being developed….***

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# Cognitive Impairment Among Survivors of SARS-CoV-2 infection—Next Steps

- **Screening for cognitive deficits among survivors of SARS-CoV-2 infection. Several screening tests are available for use in survivors of SARS-CoV-2 infection including Saint Louis University Mental Status (SLUMS) Examination, Montreal Cognitive Assessment (MoCA) and the Mini-Mental State Examination (MMSE).**

  **WHO --- WHEN ---HOW --- THAN WHAT…**

- **Social Security may have to establish new onset dementia as a "medically determinable impairment," or MDI to determine whether SARS-CoV-2 infection survivors are unable to work for 12 months and thus eligible for benefits.**

# Zeenat Qureshi Institutes 2022—Thank you

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Donka National Hosp, Conakry, Guinea

Xuan Wu Hosp, Beijing, China