



LONG-TERM HEALTH IMPACTS OF COVID-19

PRESENTATION ON RESEARCH

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Committee on Health Finance and Policy, Minnesota House of Representatives
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CONTEXT

- From previous pandemic outbreaks, such as SARS (2002) and MERS (2012), we know that coronaviruses have long-term health effects.
- In July 2020, we called for the need to research long-COVID symptoms and plan for possible mitigation strategies.

Jiang, D. H., & McCoy, R. G. (2020). Planning for the Post-COVID Syndrome: How Payers Can Mitigate Long-Term Complications of the Pandemic. *Journal of general internal medicine*, 35(10), 3036–3039. <https://doi.org/10.1007/s11606-020-06042-3>

- Long-COVID is given an official name: **Post-acute Sequelae of Severe Acute Respiratory Syndrome Coronavirus 2 Infection (PASC)**
- In July 2021, we published a comprehensive systematic review of the known manifestations long-COVID and described patients at highest risk.
 - 3,142 peer-reviewed articles published until May 31, 2021

Jiang, D. H., Roy, D. J., Gu, B. J., Hassett, L. C., & McCoy, R. G. (2021). Postacute Sequelae of Severe Acute Respiratory Syndrome Coronavirus 2 Infection: A State-of-the-Art Review. *JACC. Basic to translational science*, 6(9), 796–811. <https://doi.org/10.1016/j.jacbts.2021.07.002>

KEY POINTS FROM RESEARCH

1. PASC is very common
2. PASC is affects nearly every organ and body system
3. PASC appears to disproportionately impact racial/ethnic minorities, patients with pre-existing conditions, older patients, and rural residents
4. Impacts of PASC will be felt in all segments of society
5. Concerted efforts are urgently needed to better understand and mitigate PASC



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PASC IS VERY COMMON

POST-ACUTE SEQUELAE OF SEVERE ACUTE RESPIRATORY SYNDROME CORONAVIRUS 2 INFECTION (PASC)

“LONG COVID”

- We defined PASC as **new or continued COVID-19 symptoms persisting longer than 4 weeks after initial infection**
 - WHO Definition (Oct 6, 2021): *Post COVID-19 condition occurs in individuals with a history of probable or confirmed SARS CoV-2 infection, **usually 3 months from the onset of COVID-19 with symptoms and that last for at least 2 months and cannot be explained by an alternative diagnosis.** Common symptoms include fatigue, shortness of breath, cognitive dysfunction but also others and generally have an impact on everyday functioning. **Symptoms may be new onset following initial recovery from an acute COVID-19 episode or persist from the initial illness. Symptoms may also fluctuate or relapse over time.***
- PASC symptoms are experienced by **33% to 98%** of patients who have recovered from initial COVID-19 infection
 - Variation in rates is driven by different populations and symptoms studied
- Approximately 46 million Americans and 788,000 Minnesotans have had COVID-19
 - **At least 250,000 Minnesotans** will experience some PASC symptoms.



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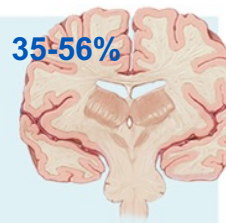
**PASC AFFECTS NEARLY EVERY
ORGAN AND BODY SYSTEM**



Neurologic

- Olfactory deficits **4-53%**
- Gustatory deficits
- Headache **17-91%**
- Cognitive impairment **21%**
- Hearing loss/earache/tinnitus **14%**
- Retinopathy (possible)

Psychiatric/mental health **35-56%**



- Insomnia
- Post traumatic stress disorder
- Depression
- Anxiety
- Obsessive compulsive syndromes
- Secondary emotional stresses (financial, social isolation, etc.)



Cardiac/cardiovascular

- Dyspnea **88%**
- Tachycardia/palpitations **11%**
- Myocarditis
- Cerebrovascular disease
- Postural tachycardia syndrome (POTS)

Pulmonary



- Dyspnea **88%**
- Cough **33%**
- Pulmonary fibrosis **65%**
- Impaired pulmonary function **22-56%**
- Pulmonary hypertension **0.6%**

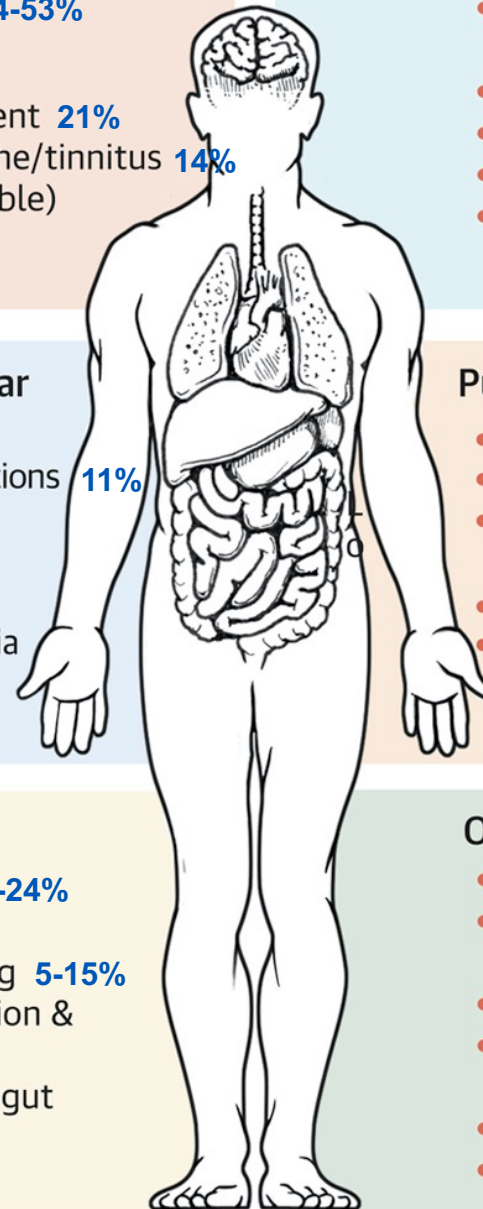


Gastrointestinal

- Loss of appetite **8-24%**
- Acid reflux **18%**
- Diarrhea & vomiting **5-15%**
- Abdominal distension & pain **7-14%**
- Possible change in gut microbiome

Other complications

- Chronic fatigue **98%**
- Kidney injury/chronic kidney disease
- Hyperglycemia/diabetes
- Pediatric inflammatory multisystemic syndrome
- Skin rash
- Hair loss



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PEDIATRIC

- Data are still emerging
- Insomnia (18.6%), fatigue (10.9%), muscle pain (10.1%), headache (10.1%), and lack of concentration (10.1%).
 - 68% of children in one study had symptoms lasting longer than 3 months.
- **PIMS/MIS-C** (Pediatric multisystem syndrome/multisystem inflammatory syndrome in children)
 - Kawasaki-like disease with toxic shock syndrome and myocarditis.
 - Days to weeks after recovery from acute infection, reports of fatigue, fever, GI symptoms, dyspnea, headache and toxic shock syndrome.
 - Reported in 2% of children
 - 30-fold increase of the disease during the COVID-19 pandemic
 - 3.5% of patients with PIMS/MIS-C die
 - More frequent in children of Afro-Caribbean descent



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**PASC APPEARS TO DISPROPORTIONATELY
IMPACT SPECIFIC POPULATIONS**

DRIVERS OF INCREASED SUSCEPTIBILITY

Racial and Ethnic Minorities

- Increased risk for exposure & severe manifestation of COVID-19
- Socioeconomic factors prevent proper self-isolation
- Less access to primary and specialty care
- Distrust of medical institutions
- Higher rate of pre-existing conditions
- Multimorbidity

Clinical Complexity

- Pre-existing conditions (obesity, diabetes, heart/lung disease, etc.)
- Multimorbidity
- Severe COVID-19 manifestation
- Prior mental health history
- Women



Older Population

- Increased risk for severe COVID-19
- Higher rate of pre-existing conditions
- Multimorbidity

Rural Residents

- Increased risk for exposure to COVID-19
- Decreased healthcare infrastructure
- Older population
- Higher rate of pre-existing conditions
- Multimorbidity




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**IMPACTS OF PASC WILL BE FELT
IN ALL SEGMENTS OF OUR
SOCIETY**

SOCIETAL IMPACTS

- **Schools**
 - Help teachers identify and support students with PASC
- **Correctional facilities**
 - Caring for aging and sicker populations
- **Workplace**
 - Reduced productivity, need for accommodations
- **Payers** (Medicaid, Medicare, private insurance, etc.)
 - Higher costs of care for a sicker population
- **Healthcare**
 - Increasing size and complexity of the patient population
 - Need resources and infrastructure to care for patients with complex health needs
 - Long-term care and rehabilitation facilities



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**CONCERTED EFFORTS ARE
URGENTLY NEEDED TO BETTER
UNDERSTAND AND MITIGATE
LONG-COVID**

RECOMMENDATIONS

- **Public health**
 - Surveillance for PASC incidence, prevalence, severity, and susceptibility
 - Prevalence of disability, absenteeism from school/work
- **Healthcare setting**
 - Multi-disciplinary PASC clinics are being introduced by academic medical centers
 - Need to support primary care providers, who care for the vast majority of patients
 - Infrastructure, resources, guidelines
- **Community setting**
 - Resources to educators and other community members to recognize PASC and manage its effects
 - Socioeconomically disadvantaged, tribal, and rural populations need to have proper resources to alleviate health disparities.
- **Payers**
 - Medicaid should cover cost associated with PASC screenings and management
 - Plan for increased expenditures

MITIGATION STRATEGIES

- **Vaccination and other infection control measures**
 - The most effective (and guaranteed) way not to get PASC is not to get COVID-19
 - Vaccination may relieve PASC symptoms
- **Ensure timely and affordable access to medical care for patients with PASC**
 - Primary care coverage and accessibility
 - Improve access to essential services
 - Physical therapy
 - Mental health counseling
 - Care management

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QUESTIONS?

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