Post COVID-19 Condition (PCC) or Long COVID

Persistent symptoms at 12-months among over 5,000 hospitalized and non-hospitalized participants in South Africa

National Institute for Occupational Health
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NATIONAL INSTITUTE FOR COMMUNICABLE DISEASES
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Definitions

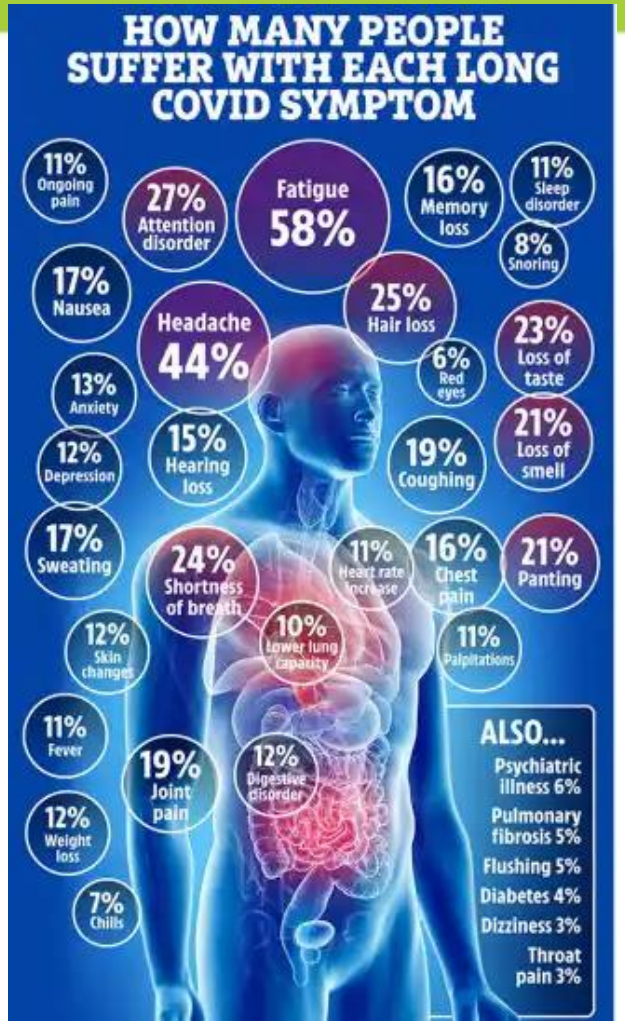
- Long COVID… Post COVID-19 Condition… Long Haulers

- Post-COVID 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 that last for at least 2 months and cannot be explained by an alternative diagnosis” (WHO, 2021)

Epidemiology

- 10-30% infected with SARS-CoV-2 may be affected by PCC (Fernandez, 2021)
- As many as 60% of COVID-19 survivors will experience PCC at least during the first year (Han, 2022)
- Persistent symptoms reported up to two years after acute COVID-19 (Huang, 2022)
- South Africa
  - Anti-SARS-CoV-2 antibody sero-prevalence 90% (Bingham)
  - Over 5 million South Africans likely affected by Long COVID

Symptoms


HOW MANY PEOPLE SUFFER WITH EACH LONG COVID SYMPTOM
11% Ongoing pain
27% Attention disorder
Fatigue 58%
16% Memory loss
11% Sleep disorder
8% Snoring
17% Nausea
Headache 44%
25% Hair loss
6% Red eyes
23% Loss of taste
13% Anxiety
12% Depression
15% Hearing loss
19% Coughing
21% Loss of smell
17% Sweating
24% Shortness of breath
11% Heart rate increase
16% Chest pain
21% Panting
12% Skin changes
10% Lower lung capacity
11% Palpitations
11% Fever
19% Joint pain
12% Digestive disorder
12% Weight loss
7% Chills
ALSO...
Psychiatric illness 6%
Pulmonary fibrosis 5%
Flushing 5%
Diabetes 4%
Dizziness 3%
Throat pain 3%

Consequences of Long COVID

Health

- Persistent and fluctuating symptoms
- Debilitating impacts on health
- Ongoing rehabilitation needs

Work

- Ability to return to work (RTW) safely
- Linking abilities to work demands
- Managements attitude to accommodating RTW

Social and Economic

- Financial impact on individual / society
- Social attitudes to sufferers
- Social security systems

Methods

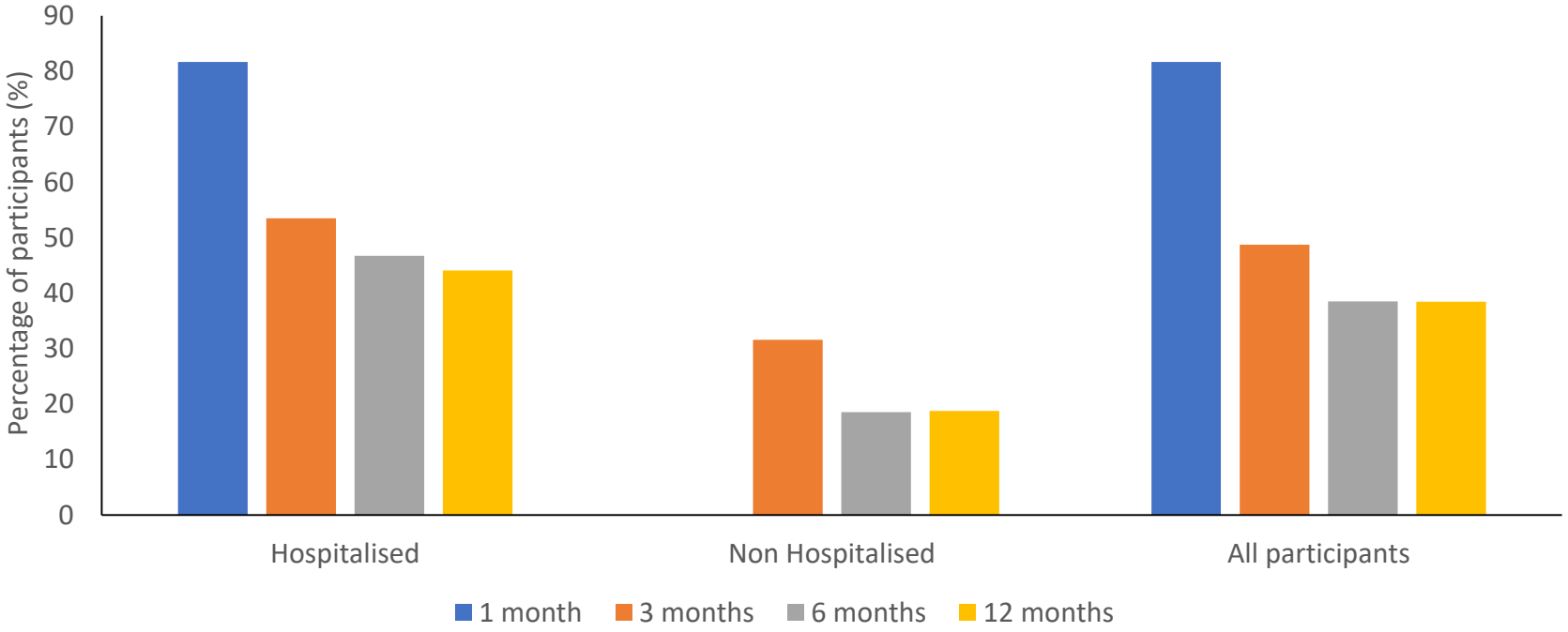
- **Objectives:**
  - *Determine prevalence of Long COVID*
  - *Estimate risk factors for Long COVID*
  - *Characterise impact of Long COVID on quality of life, occupation and healthcare utilisation*
- **Study Design**: *Quantitative longitudinal cohort, ISARIC global study*
- **Sampling**: *SARS-CoV-2-infected patients completing 12-month follow-up*
  - *1,356 hospitalised participants from the D614G wave*
  - *1,149 hospitalised COVID-19 patients from Beta wave*
  - *659 hospitalised COVID-19 patients from Delta wave*
  - *833 hospitalised COVID-19 patients from Omicron wave*
  - *1,150 non-hospitalised SARS-CoV-2 positive from Delta wave*
- **Data collection:** *ISARIC CRF*
  - *1, 3, 6 and 12 month follow up*
  - *15-20 min telephonic interview*
- **Funding***: Bill and Melinda Gates Foundation*
- **Ethics***: University of the Witwatersrand Human Research Ethics Committee (HREC M201150)*

RESULTS

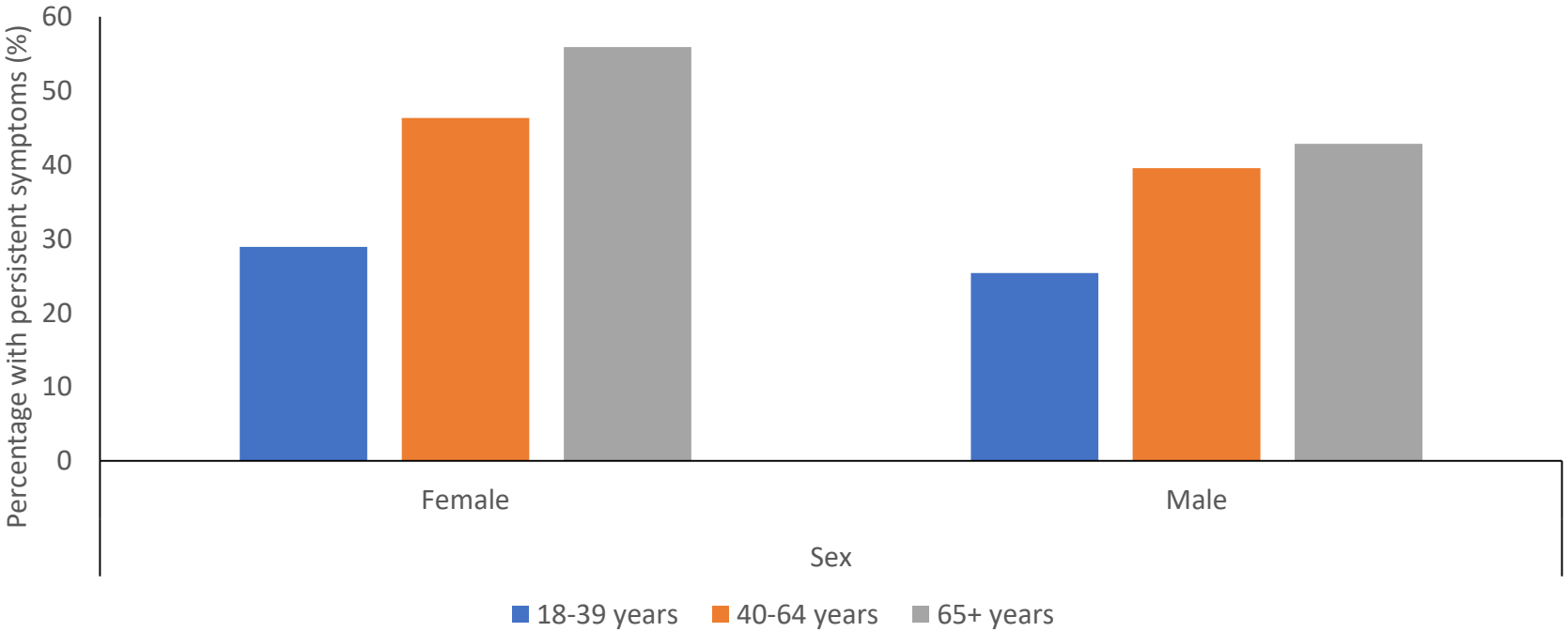
Participant Characteristics

Characteristics	Hospitalised N=3,997 (%)	Non-hospitalised N=1,150 (%)	Total N=5,147
Median age (IQR)	49 [37-59]	37 [28-47]	46 [35-57]
Age group			
<40 years	1,173 (29.35)	650 (56.52)	1,823 (35.42)
40-64 years	2,183 (54.62)	455 (39.57)	2,638 (51.25)
≥65 years	641 (16.04)	45 (3.91)	686 (13.33)
Sex			
Female	2,234 (55.89)	679 (59.04)	2,913 (56.60)
Male	1,763 (44.11)	463 (40.26)	2,226 (43.25)
Race			
White	1,130 (28.27)	345 (30.00)	1,475 (28.66)
Black	2,131 (53.31)	576 (50.09)	2,707 (52.59)
Mixed race	390 (9.76)	165 (14.35)	555 (10.78)
Indian	278 (6.96)	61 (5.30)	339 (6.59)
Other/Asian	15 (0.38)	3 (0.26)	18 (0.35)
Number of Comorbidities			
No Comorbidities	1,318 (32.97)	771 (67.04)	2,089 (40.59)
1 Comorbidity	1,275 (31.90)	245 (21.30)	1,520 (29.53)
2 Comorbidities	891 (22.29)	99 (8.61)	990 (19.23)
≥ 3 Comorbidities	513 (12.83)	35 (3.04)	548 (10.65)

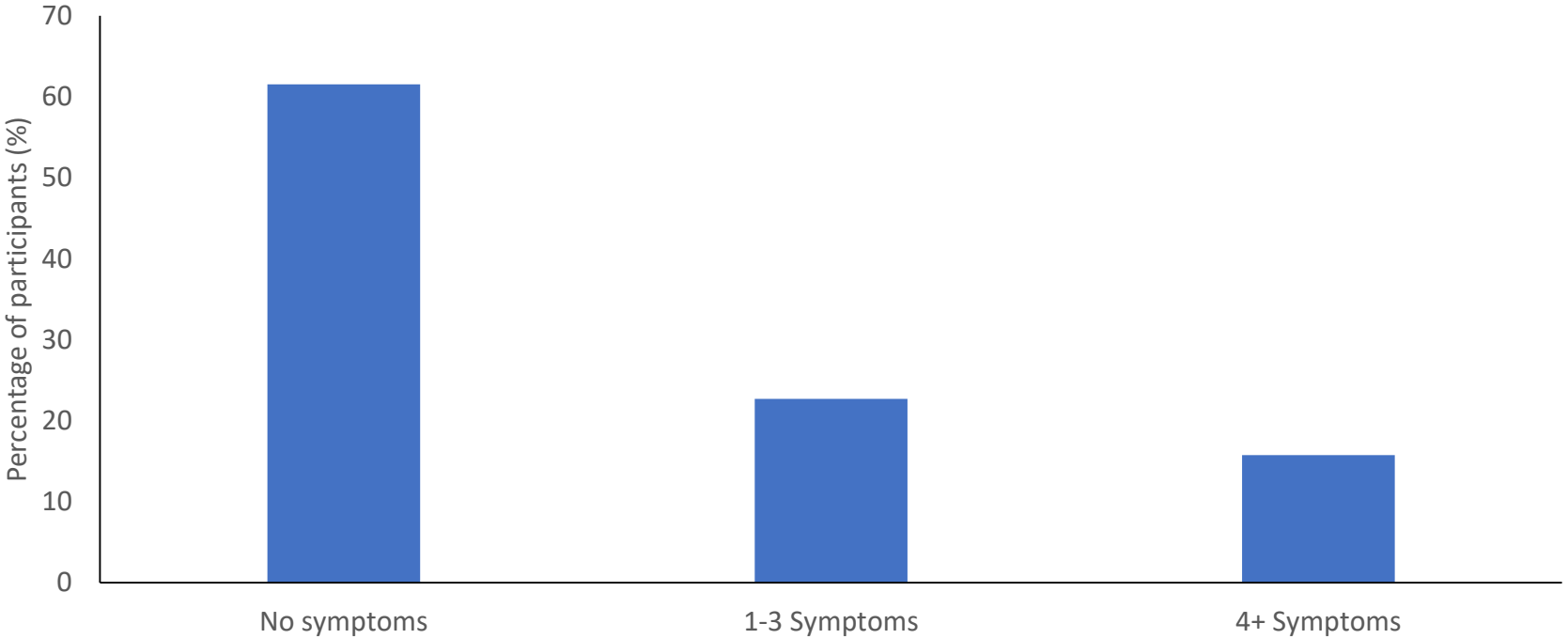
Percentage with symptoms 1, 3, 6 and 12 months after SARS-CoV-2 infection, among hospitalised and non-hospitalised participants



Percentage of participants with ≥1 persistent symptoms at 12-months after SARS-CoV-2 infection, by sex and age



Number of symptoms reported by participants at 12-months after SARS-CoV-2 infection



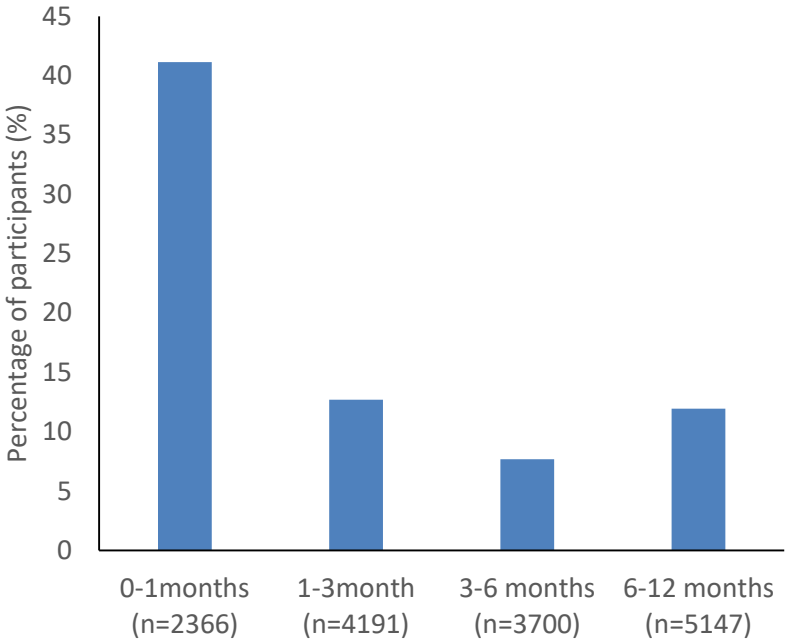
Frequency of most common symptoms among hospitalised and non-hospitalised participants at 12-months after SARS-CoV-2 infection

% symptoms	Hospitalised	Non hosptalised	Total
Shortness of breath/ breathlessness	27,5	6,4	22,8
Fatigue	23,7	10,4	20,8
Headache	13,3	4,2	11,3
Chest pains	12,3	2,4	10,6
Joint Pain or swelling	10,1	1,7	8,2
Confusion/lack of concentration	9,4	0,2	7,6
Persistent muscle pain	9,3	1,1	7,5
Problems seeing/blurred vision	8,1	1,8	6,7
Problems sleeping	7,5	1,2	6,1

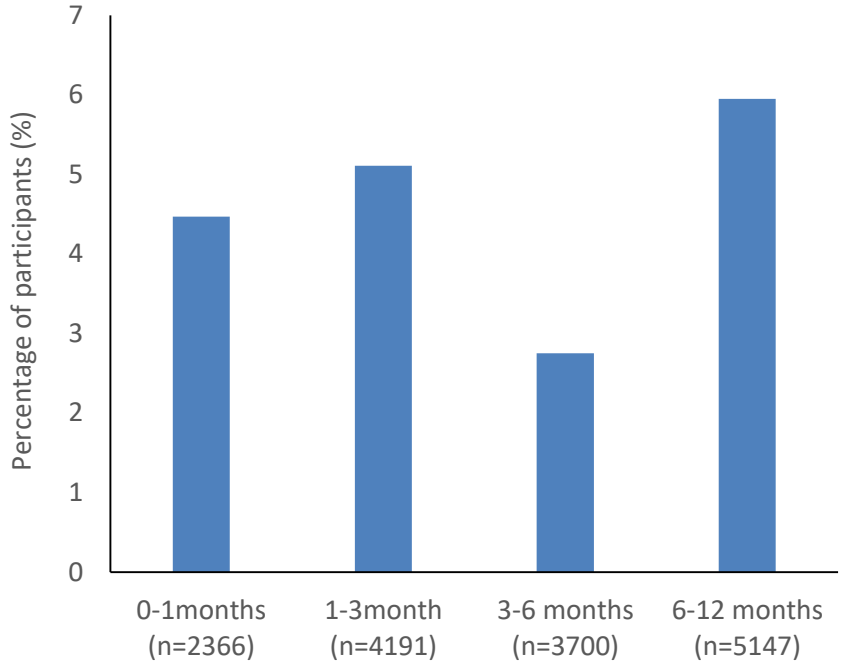
Factors associated with new or persistent symptoms at 12 months after SARS-CoV-2 infection

Characteristic	Persistent symptoms n/N (%)	aIRR (95% CI)
Age group (years)		
18-40	504/1,823 (27.65)	Reference
40-64	1,138/2,638 (43.14)	1.06 (0.94-1.19)
≥65	337/686 (49.13)	1.13 (0.97-1.32)
Sex		
Male	804/2,226 (36.12)	Reference
Female	1,1173/2,913 (40.27)	1.27 (1.16-1.39)
Race		
Black	901/2,707 (33.28)	Reference
White	648/1,475 (43.93)	1.32 (1.18-1.47)
Indian	158/339 (46.61)	1.30 (1.10-1.55)
Mixed race	240/555 (43.24)	1.21 (1.05-1.40)
Comorbidity		
No	567/2,089 (27.14)	Reference
Yes	1,412/3,058 (46.17)	1.16 (1.04-1.29)
Number of acute symptoms		
0	132/813 (16.24)	Reference
1-3	381/1,234 (30.88)	1.37 (1.10-1.70)
4 or more	1,466/3,100 (47.29)	2.07 (1.69-2.54)
COVID-19 severity		
Non-hospitalised	216/1,150 (18.78)	Reference
Hospitalised (no oxygen)	341/1,230 (27.72)	1.59 (1.28-1.97)
Hospitalised (oxygen therapy)	677/1,460 (46.37)	1.81 (1.48-2.23)
Hospitalised (ventilated or ICU)	745/1,307 (57.00)	2.11 (1.70-2.60)
SARS-CoV-2 variant		
D614G	848/1,356 (62.54)	Reference
Beta	495/1,149 (43.08)	0.62 (0.56-0.70)
Delta	489/1,809 (27.03)	0.55 (0.48-0.64)
Omicron	147/833 (17.65)	0.33 (0.27-0.41)

Frequency of medical visits reported

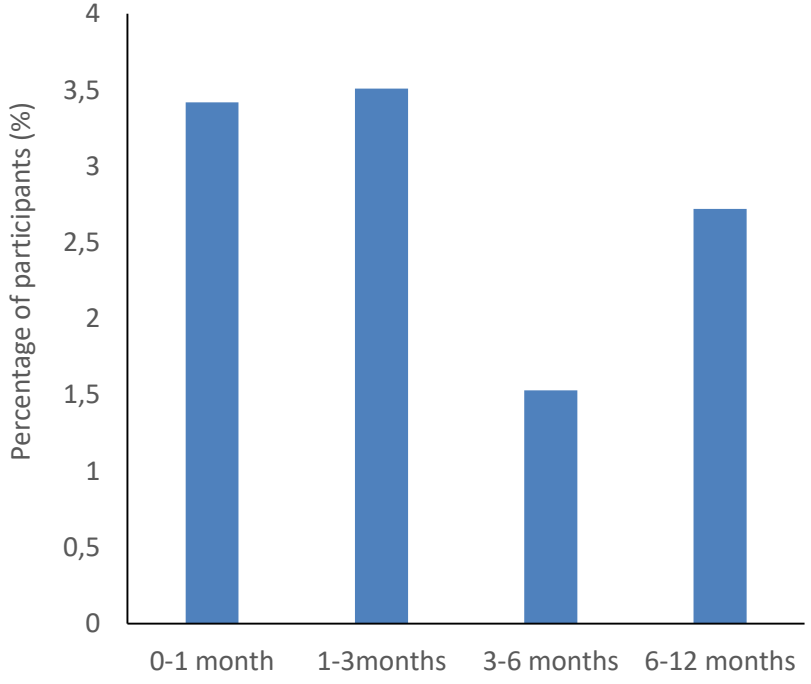


Frequency of medical readmissions reported

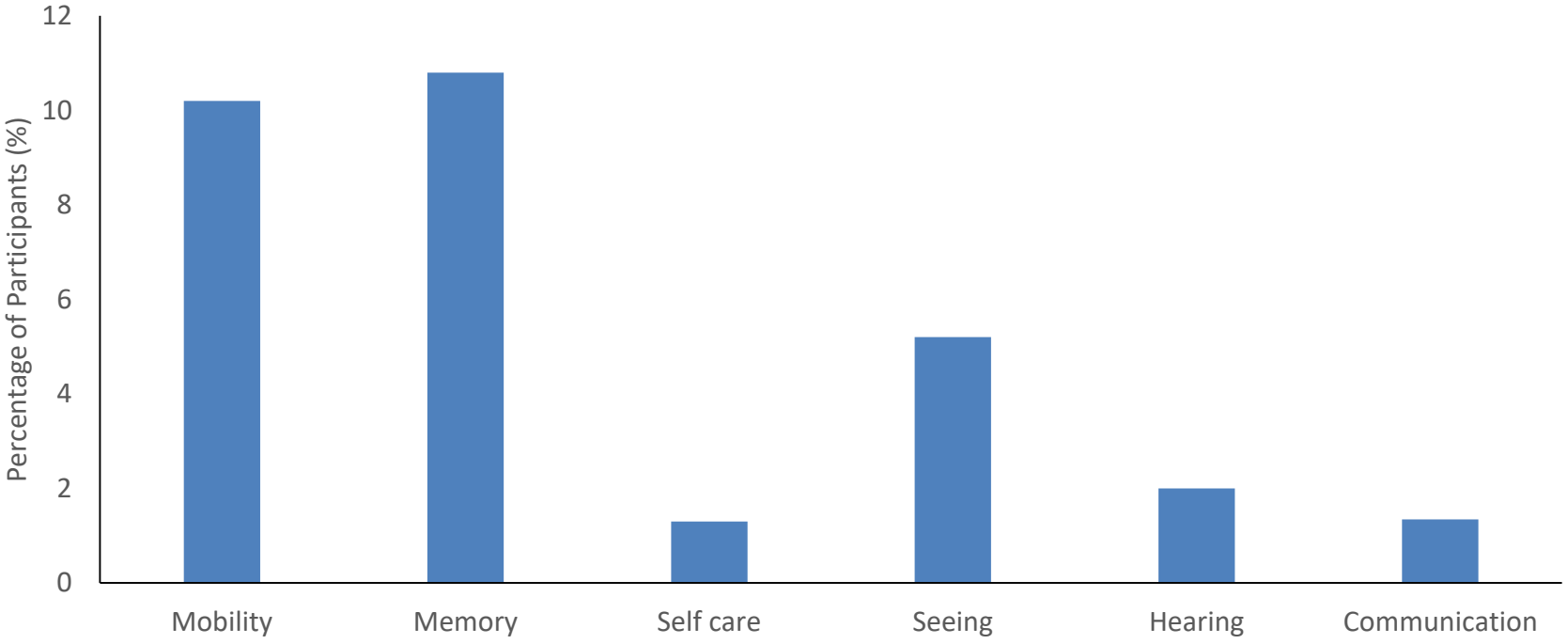


Frequency of medical complications reported from SARS-CoV-2 infection to 12-months (N=6,046)

- 62 (1.0%) heart attack
- 80 (1.3%) stroke
- 217 (3.6%) pulmonary embolism
- 53 (0.9%) deep vein thrombosis
- 263 (4.4%) kidney problems

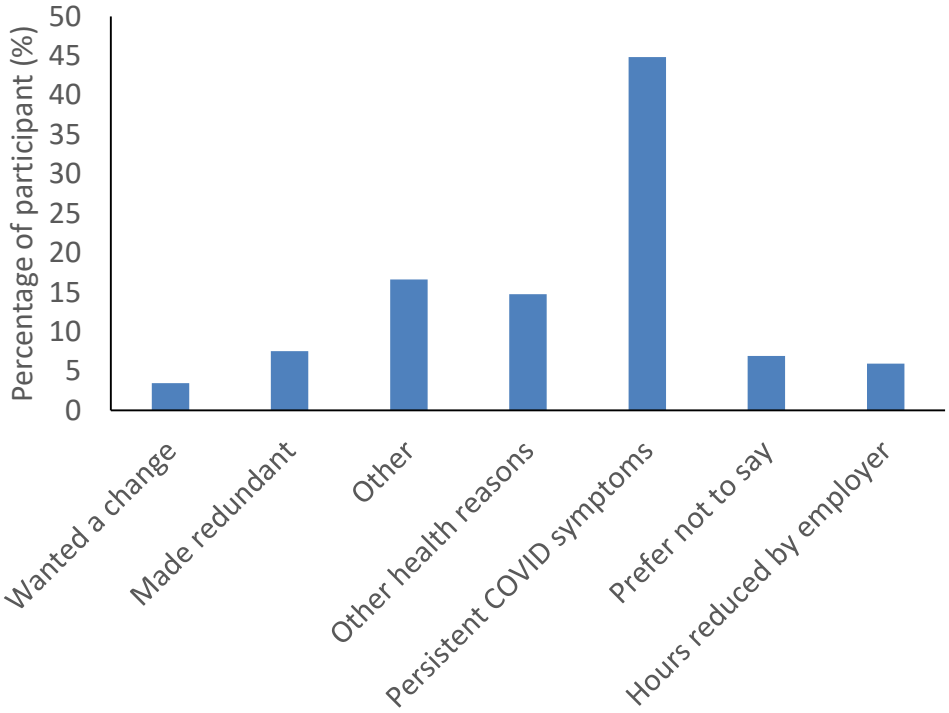


Percentage of participants with worsened quality of life by 12 months after SAS-CoV-2 infection



Percentage of participants reporting reasons for change in occupation following COVID-19 (N=319)

- At 12 months, 319/6,046 (5.3%) participants reported that their occupation had changed after COVID-19
- Among these participants, 144/319 (45.1%) reported that the change was due to persistent symptoms after COVID-19



Summary

- High proportion of patients with persistent symptoms at 12-months post COVID-19
  - Improvement in symptoms over time
  - 44% (hospitalised) and 19% (non-hospitalised)
- Risk factors:
  - Older age, female sex, non-Black race, comorbidities, higher number of symptoms during acute illness, severity of COVID-19
  - Lower odds in Beta, Delta and Omicron waves
  - No association with individual comorbidities
- Increased health seeking
- Impact of Long COVID on personal and work life

Long COVID in LMICs

- Few studies have characterised the Long COVID burden in LMICs
- Insufficient research or surveillance infrastructure (Colombo, 2020)
- Insufficient testing and under-reporting for SARS-CoV-2 (Bradshaw, 2022)
- Inadequate capacity for multidisciplinary rehabilitation services (Sivan, 2021)
- Constrained health systems, under-resourced PHC services, many competing health priorities (Uddin, 2022)
- Chronic disability resulting from Long COVID is likely to place an additional burden on already overstretched healthcare resources
- Lower coverage of adequate social protection measures to mitigate ongoing negative impacts of the pandemic
- Inequity in access to vaccines and lower vaccination coverage in LMICs (UNDP, 2023)
- Limited access to novel COVID-19 therapeutics, accessing candidate Long COVID treatments may be a challenge

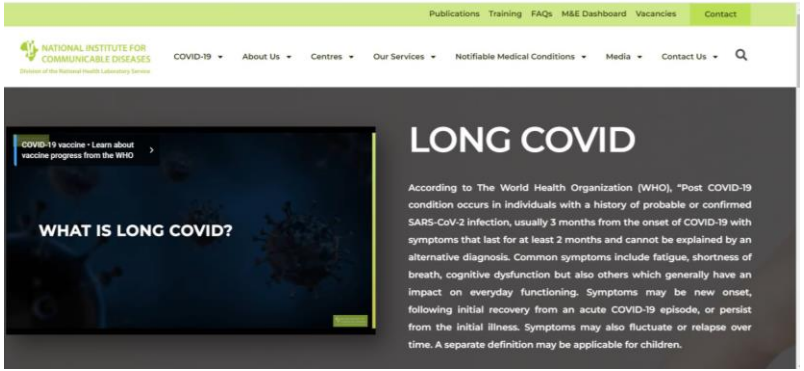
Recommendations

- Health services
  - Patient messaging and support groups
  - Guidelines and HCW training
  - Multidisciplinary health services planning
  - Encourage COVID-19 vaccination

- Occupational health services
  - Employment rights and benefits
  - Gradual return to work
  - Work/task reallocation
  - Access to benefits (healthcare, sick leave, financial support)

Advocacy and communication

- NICD webpage
- Publications
- Media
- Conferences
- NDoH Clinical Task Team
  - Long COVID guidelines
  - Training HCWs webinar
- Advocacy organisations
- Long COVID support group




CLINICAL UPDATE

Long-COVID: An evolving problem with an extensive impact

SAMJ IN PRACTICE

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A cohort study of post-COVID-19 condition across the Beta, Delta, and Omicron waves in South Africa: 6-month follow-up of hospitalized and nonhospitalized participants

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Comment

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Long COVID in low-income and middle-income countries: the hidden public health crisis

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