LATINX LONG COVID SYMPOSIUM: Study Findings and Pathways to Health
AGENDA

> Introductions
> Background
> Survey Methods
> Survey Results
> Q&A
> Panel
PRESENTERS

> Jazmine Castillo (Allen Institute)
> Samir Racid Zaim (Allen Institute)
> Leo Morales (Latino Center for Health, UW)
STUDY COLLABORATORS

> Latino Center for Health, UW
> SeaMar Community Health Centers
> Yakima Valley Farm Workers Clinic
> Allen Institute for Immunology
> UW Medicine Long COVID Clinic
STUDY MOTIVATION

- Latinos in WA have experienced high rates of infection, hospitalization, and mortality due to COVID-19.
- Latinos have high rates of chronic conditions including HTN, DM and CVD, predisposing them to Long COVID.
- Data on Long COVID among Latinos is limited, despite elevated risk factors.
WHAT IS LONG COVID?

Persisting symptoms 3 months after initial COVID infection that aren’t explained by other medical conditions.

• Symptoms can be new after recovering from acute COVID or persist from the initial illness.

• Symptoms may fluctuate or relapse over time.

• Lack of laboratory or imaging abnormalities does NOT invalidate the existence, severity, or importance of a patient’s symptoms or conditions.
Who is at higher risk for Long COVID?

- Women
- Black, Hispanic, AIAN, and Pacific Islanders
- Socioeconomic disadvantage
- Tobacco use
- Obesity
- Comorbidities: diabetes, chronic lung disease, prostate disease, fibromyalgia, anxiety, depression, migraine, multiple sclerosis, celiac disease and learning disabilities

More than 50 long-term effects of COVID-19: a systematic review and meta-analysis

More Than 100 Persistent Symptoms of SARS-CoV-2 (Long COVID): A Scoping Review

Lawrence D. Hayes, Joanne Ingram and Nicholas F. Sculthorpe

Characterizing long COVID in an international cohort: 7 months of symptoms and their impact

Hannah E. Davis, Gina S. Assaf, Lisa McCorkell, Hannah Wei, Ryan J. Low, Yochai Re'em, Signe Redfield, Jared P. Austin, Athena Akrami

203 Symptoms in 10+ Organ systems
How common is Long COVID?
SOLVE Long COVID Initiative

Reported Case Model

**Adults in US**

<table>
<thead>
<tr>
<th>with LC (Long Covid)</th>
<th>Total Number</th>
<th>22 million</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>of Adult population</td>
<td>6.9%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>with DLC (Disabling Long Covid)</th>
<th>Total Number</th>
<th>7 million</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>of Adult population</td>
<td>2.3%</td>
</tr>
</tbody>
</table>

Financial Burden to Jan 31, 2022

- $386 billion

Calculation of the average losses for an adult with LC applied to prevalence, includes lost wages, lost savings, and medical expenses

Seroprevalence Model

**Adults in US**

<table>
<thead>
<tr>
<th>with LC (Long Covid)</th>
<th>Total Number</th>
<th>43 million</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>of Adult population</td>
<td>13.4%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>with DLC (Disabling Long Covid)</th>
<th>Total Number</th>
<th>14 million</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>of Adult population</td>
<td>4.4%</td>
</tr>
</tbody>
</table>

Financial Burden to Jan 31, 2022

- $511 billion

Calculation of the average losses for an adult with LC applied to prevalence, includes lost wages, lost savings, and medical expenses

Long COVID rates remain high among Latinos in WA state.
METHODS
SURVEY METHODS

- UW IRB Approval: STUDY00016577
- Eligibility
- Survey development
- Sample frame selection
- Survey administration
ELIGIBILITY

> SeaMar and YVFWC patients
> 18+ years of age
> COVID DX: 1/1/2020 to 12/31/2022
> Latino/Hispanic ethnicity
> Clinic visit in last 6 months
> English or Spanish language preference
SURVEY DEVELOPMENT

Survey domains:
- Demographics and socioeconomic status
- Medical co-morbidities
- Vaccination history
- Symptoms
- HRQoL (cognition, sleep, pain, fatigue, mental health)

English and Spanish translation
SAMPLE FRAME

- Oversampled older patients
- Oversampled males
- Oversampled delta variant
- Geographic balance

SeaMar
n=7,043

YVFWC
n=9,934

Sample of Eligible
n=16,977

Selected for Survey
n=8,000 (47%)

Responded to Survey
N=1546 (19%)
Mail with online option
Spanish and English
Cover letter + survey → postcard → survey → postcard → survey
$20 incentive to complete the survey
RESULTS
## SAMPLE CHARACTERISTICS (n=1546)

### Geographic Coverage of Respondents

![Map of Washington state showing count]  

<table>
<thead>
<tr>
<th>Demographics</th>
<th>All</th>
</tr>
</thead>
<tbody>
<tr>
<td>Count, N</td>
<td>1546</td>
</tr>
<tr>
<td>Age, Mean (SD)</td>
<td>46.9 (15.8)</td>
</tr>
<tr>
<td>Female, N (%)</td>
<td>695 (45%)</td>
</tr>
<tr>
<td>Mexican, N (%)</td>
<td>1278 (82.7%)</td>
</tr>
<tr>
<td>&lt; $50k Annual Income, N (%)</td>
<td>929 (60.1%)</td>
</tr>
<tr>
<td>Education (High School or less), N (%)</td>
<td>988 (63.9%)</td>
</tr>
<tr>
<td>Completed Survey in English, N (%)</td>
<td>585 (37.8%)</td>
</tr>
<tr>
<td>Agreed to Contact, N (%)</td>
<td>1024 (66.2%)</td>
</tr>
</tbody>
</table>
NUMBER OF COVID INFECTIONS

• 57% reported 1 infection
• 40% reported 2 or more infections
SYMPTOM SEVERITY DURING COVID ILLNESS

- 20% mild to no symptoms
- 31% severe to life-threatening symptoms
### SYMPTOM PREVALENCE & DURATION

**Example: Fatigue**

<table>
<thead>
<tr>
<th>Did you have this symptom or did this symptom get worse following a COVID-19 infection? (check if yes)</th>
<th>How long did this symptom last?</th>
<th>Do you still have this symptom? (check if yes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>○</td>
<td>○ Less than 1 month</td>
<td>○</td>
</tr>
<tr>
<td>○</td>
<td>○ 1-2 months</td>
<td>○</td>
</tr>
<tr>
<td>○</td>
<td>○ 3 months or more</td>
<td>○</td>
</tr>
</tbody>
</table>
SYMPTOM PREVALENCE & DURATION

- Top 4:
  - Fatigue
  - Muscle pain
  - Anxiety
  - Sleep difficulty
LONG COVID SYMPTOM PREVALENCE – 3 MONTHS

- Fatigue, pain and anxiety were among the most common symptoms
41% of respondents met the definition of Long COVID
COMORBIDITIES

Legend:
> Pre Covid = existing pre disease
> Post COVID = new, not pre-existing comorbidity

Results:
> Most Common New Comorbidities
  — Depression (SAD)
  — High Cholesterol (HIC)
  — Obesity
  — High blood pressure
  — Asthma

![Bar chart showing novel post-COVID comorbidities](image-url)
RESULTS BY LONG COVID STATUS: LONG COVID VS. RECOVERED
# DEMOGRAPHIC BREAKDOWN

<table>
<thead>
<tr>
<th>Demographics</th>
<th>Recovered</th>
<th>Long Covid</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Count, N</strong></td>
<td>918</td>
<td>628</td>
<td></td>
</tr>
<tr>
<td><strong>Age, Mean (SD)</strong></td>
<td>47.3 (16.6)</td>
<td>46.3 (14.5)</td>
<td>0.27 *</td>
</tr>
<tr>
<td><strong>Female, N (%)</strong></td>
<td>355 (38.7%)</td>
<td>340 (54.1%)</td>
<td>&lt;0.001 #</td>
</tr>
<tr>
<td><strong>Mexican, N (%)</strong></td>
<td>739 (80.5%)</td>
<td>539 (85.8%)</td>
<td>0.008 #</td>
</tr>
<tr>
<td><strong>&lt; $50k Annual Income, N (%)</strong></td>
<td>527 (57.4%)</td>
<td>402 (64%)</td>
<td>0.01 #</td>
</tr>
<tr>
<td><strong>Education (High School or less), N (%)</strong></td>
<td>587 (63.9%)</td>
<td>401 (63.9%)</td>
<td>1 #</td>
</tr>
<tr>
<td><strong>Completed Survey in English, N (%)</strong></td>
<td>354 (38.6%)</td>
<td>231 (36.8%)</td>
<td>0.488 #</td>
</tr>
<tr>
<td><strong>Agreed to Contact, N (%)</strong></td>
<td>569 (62%)</td>
<td>455 (72.5%)</td>
<td>&lt;0.001 #</td>
</tr>
</tbody>
</table>

* = Wilcoxon Rank-Sum Test, # = Fishers Exact Test
COVID CASES BY RECOVERY STATUS

- Having COVID two or more times more likely to have Long COVID symptoms
COVID SEVERITY BY RECOVERY STATUS

- Those with Long COVID symptoms more likely to have had severe and life-threatening COVID symptoms
COMORBIDITIES

Legend:
> Pre Covid = existing pre disease
> Post COVID = new, not pre-existing comorbidity

Results:
> Biggest Differences
  – Depression (SAD)
  – High Cholesterol (HIC)
  – Obesity
  – High blood pressure
  – Asthma
WELL BEING MEASURES
Quality of Life Since First COVID Infection

![Quality of Life Chart]

- **LONG COVID**
  - 1=EXCELLENT: 11.5%
  - 2=VERY GOOD: 18.9%
  - 3=GOOD: 36.1%
  - 4=FAIR: 26.2%
  - 5=POOR: 12.3%

- **RECOVERED**
  - 1=EXCELLENT: 9.7%
  - 2=VERY GOOD: 29.8%
  - 3=GOOD: 44.6%
  - 4=FAIR: 3.9%
  - 5=POOR: 3.9%
Change in Overall Health Since First Infection
Change in Cognitive Function
New Onset Fatigue Since First COVID Infection
Changes in Social Role Since First COVID Infection

![Bar chart showing changes in social roles for recovered and long COVID cohorts](chart.png)
Changes in Cognitive Function

12. Since you had COVID-19 for the first time:

12a. Do you have more trouble adding and subtracting numbers in your head?

12b. Do you have more trouble shifting between activities that require thinking?

12c. Do you have to work harder to keep track of what you are doing?

12d. Does it seem like your brain is not working as well as before having COVID-19?

12e. Do you have more trouble concentrating on things now than before having COVID-19?

12f. Compared to before having COVID-19, do you have to work harder to pay attention to avoid making mistakes?
Changes in Pain and Pain Interference Since First COVID Infection

<table>
<thead>
<tr>
<th>Pain Interference</th>
<th>Recovered</th>
<th>Long COVID</th>
</tr>
</thead>
<tbody>
<tr>
<td>1+ Change in Pain Interference</td>
<td>14.1%</td>
<td>41.4%</td>
</tr>
<tr>
<td>Pain Interferes with Daily Activities</td>
<td>11.3%</td>
<td>35.2%</td>
</tr>
<tr>
<td>Pain Interferes with Work Around Home</td>
<td>11%</td>
<td>34.4%</td>
</tr>
<tr>
<td>Pain Interferes with Social Activities</td>
<td>8.5%</td>
<td>32%</td>
</tr>
</tbody>
</table>
Changes in Sleep Since First COVID Infection

- 26.1% reported having WORSE or MUCH WORSE sleep
CHANGES IN MENTAL HEALTH

Depression

- 1+ Change in Depression Levels: 59.9%
- Less Interest or Pleasure in Doing: 52.7%
- More Sad, Depressed, or Hopeless: 49.5%

Anxiety

- 1+ Change in Anxiety Levels: 75.5%
- Don't Feel Like the Same Person: 64.8%
- Less Able to Stop Worrying: 38.9%
- More Nervous, Anxious, or On Edge: 39.2%

Cohort
- Recovered
- Long COVID
CHANGES IN OVERALL HRQoL
LONG COVID OUTCOMES BY SOCIO-DEMOGRAPHIC GROUPS
Women experienced more severe symptoms and higher rates of current symptoms.

<table>
<thead>
<tr>
<th>Demographics</th>
<th>Female</th>
<th>Male</th>
</tr>
</thead>
<tbody>
<tr>
<td>Count, N</td>
<td>695</td>
<td>761</td>
</tr>
<tr>
<td>Age, Mean (SD)</td>
<td>45.6 (15.2)</td>
<td>48 (15.8)</td>
</tr>
<tr>
<td>Avg. # COVID Infections, Mean (SD)</td>
<td>1.7 (1.1)</td>
<td>1.6 (1.3)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Female (%)</th>
<th>Male (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Severe to Life Threatening Symptoms</td>
<td>236 (34%)</td>
<td>222 (29.2%)</td>
</tr>
<tr>
<td>Exp Fatigue 3+ Months</td>
<td>144 (20.7%)</td>
<td>101 (13.3%)</td>
</tr>
<tr>
<td>Long COVID</td>
<td>340 (48.9%)</td>
<td>264 (34.7%)</td>
</tr>
<tr>
<td>Currently Exp Symptoms</td>
<td>317 (45.6%)</td>
<td>247 (32.5%)</td>
</tr>
</tbody>
</table>
LONG COVID SYMPTOMS
BY GENDER

5 Most Common Symptoms

Women
- Fatigue
- Anxiety
- Sleep Difficulty
- Muscle Pain
- Loss of taste or smell

Men
- Fatigue
- Muscle Pain
- Shortness of Breath
- Anxiety
- Feeling Unwell after Exercise

![Graph showing the percentage of subjects with symptoms lasting 3+ months by gender. The graph lists symptoms such as Fatigue, Anxiety, Sleep Difficulty, Loss of Taste or Smell, Muscle Pain, Shortness of Breath, Feeling Unwell after Exercise, and more, with percentages for male and female subjects.](image)
SYMPTOM PREVALENCE & DURATION BY AGE

- Long COVID Estimates similar between <40 and 40-65
- 40-65 and 65+ most likely to currently have symptoms

<table>
<thead>
<tr>
<th>Demographics</th>
<th>(0,40]</th>
<th>(40,64]</th>
<th>(64,100]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Count, N</td>
<td>528</td>
<td>723</td>
<td>205</td>
</tr>
<tr>
<td>Age, Mean (SD)</td>
<td>30.5 (6.4)</td>
<td>51.6 (6.6)</td>
<td>72.3 (6.7)</td>
</tr>
<tr>
<td>Avg. # COVID Infections, Mean (SD)</td>
<td>1.6 (1)</td>
<td>1.7 (1.2)</td>
<td>1.7 (1.6)</td>
</tr>
<tr>
<td>Severe to Life Threatening Symptoms, N (%)</td>
<td>183 (34.7%)</td>
<td>225 (31.1%)</td>
<td>50 (24.4%)</td>
</tr>
<tr>
<td>Exp Fatigue 3+ Months, N (%)</td>
<td>73 (13.8%)</td>
<td>149 (20.6%)</td>
<td>23 (11.2%)</td>
</tr>
<tr>
<td>Long COVID, N (%)</td>
<td>221 (41.9%)</td>
<td>319 (44.1%)</td>
<td>64 (31.2%)</td>
</tr>
<tr>
<td>Currently Exp Symptoms, N (%)</td>
<td>172 (32.6%)</td>
<td>302 (41.8%)</td>
<td>90 (43.9%)</td>
</tr>
</tbody>
</table>
LONG COVID SYMPTOMS

40-65 reporting more of almost every symptom. Biggest differences are seen in:

• Fatigue
• Loss of Smell
• Muscle Pain
Long COVID by Occupation

No Major Differences Reported in Long COVID Rates by Occupation
Long COVID by Insurance Status

Higher Rates of Uninsured Respondents in Long COVID group
CONCERN FOR JOB LOSS DUE TO ILLNESS

Long COVID respondents indicate higher rates of concern over job loss.
CONCERN ABOUT MONEY DUE TO ILLNESS

~45% Long COVID respondents very worried with illness-related financial strain vs ~30% of recovered patients
FOOD SECURITY

~25% Long COVID respondents indicate food insecurity vs ~16% of recovered patients
~40% Long COVID respondents indicate financial insecurity vs ~22% of recovered patients
OVERALL Long COVID Impact

Change in Overall Health

Unresolved COVID Symptoms

Decrease in Quality of Life

More Novel Comorbidities

Concern over Economic Wellbeing
SUMMARY OF MAIN POINTS
MAIN TAKEAWAYS

• 41% of respondents report Long COVID
• 38% reported symptoms at time of survey
• Long COVID has significant impacts on physical, social, and mental well-being
• A clear diagnostic process is lacking
• Access to care for long COVID is limited
Questions and Discussion