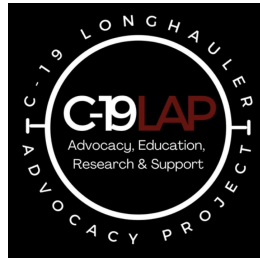


Mathematical Breakdown and Formulas for Long COVID Calculations

The COVID-19 Longhailer Advocacy Project ([C-19 LAP](#)) was formed in June 2020 to raise awareness and advocate for the staggering and growing number of COVID Longhailers in the United States. C-19 LAP in partnership with the Long Covid and chronic illness communities, is calling for the immediate formation of Long Covid Assistance Programs (LCAP) and a Long Covid Task Force (LCTF) to address the neglected needs of this population. COVID-19 has brought financial devastation to millions of COVID Longhailers in the United States (and around the world), creating a crisis that will have decades-long consequences for individuals and the nation alike if not addressed immediately. All calculations included in our [letter](#) and linked to this document are estimates and were computed by us, to the best of our abilities using the existing information and data available at this time.

For purposes of all calculations here, we will be using the following baselines.

- At the time of calculations, December 2021, U.S Cases were at 52 Million.
- 10% of COVID-19 cases result in Long COVID (most conservative estimate), out of 52M documented infections. (Some estimates will also be provided based on the CDC'S estimated 146.6M infections from October 2021, which has since grown but has not been updated.)
- 85% of COVID Longhailers were NOT hospitalized for acute COVID-19.
- 85% of COVID Longhailers are women and 15% are men.
- 95% of COVID Longhailers have had their employment impacted: 44% are unable to work at all while 51% are able to work part time.
- Working Age Percentage of COVID Longhailers: 71.5%
- Labor Force Participation Rate of COVID Longhailers: 62%
- Average medical cost per COVID Longhailer \$36,408
- All polls mentioned originated in the COVID-19 Longhailer Advocacy Project, a private online group only open to members who are Longhailers, their caretakers, medical providers, and researchers. Only members have access to the group and are able to participate in polls.



Step 1: Total **DOCUMENTED** cases in the United States: 52,000,000 (With undocumented cases, this number is likely double)

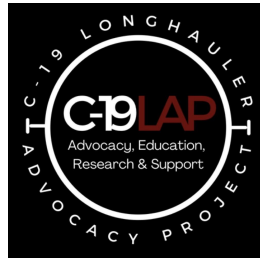
COVID Longhailers @ 10% of infections = 5,200,000 **best case / most conservative scenario in terms of percentage, as many experts cite a 30-40% Long Covid rate.

Step 2:

October 2021 poll by the [COVID-19 Longhailer Advocacy Project](#) assessing the work capacity of COVID-19 Longhailers compared to pre-COVID work capacity.

% of ability to work	Responses	% of respondents
0	112	44
1-9	10	4
10-19	11	4
20-29	23	9
30-39	8	3
40-49	2	0
50-59	37	15
60-69	8	3
70-79	8	3
80-89	14	6
90-99	9	4
100	12	5

- 44% of COVID Longhailers polled are not able to work at all.
- 5% of COVID Longhailers polled are able to work at 100%.
- 51% of COVID Longhailers polled are reduced to working part-time.
 - <30% Capacity= 44/142= 31%
 - <50% Capacity= 83/142= 58%
 - <70% Capacity= 99/142= 70%
 - >70% Capacity= 31/142= 22%



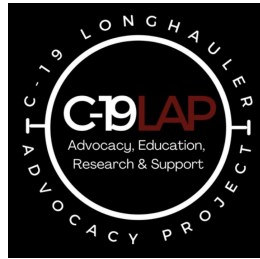
Step 3:

Quick Stats

Data from a poll distributed (12/13/21) in the [COVID-19 Longhailer Advocacy Project](#) (376) and [Long Haul COVID Fighters](#) (120) groups, assessing the experiences of COVID Longhailers (496) who have been out of work (OOW) (44%- 2,288,000) or reduced to working part time (PT) (51%- 2,652,000).

- A total of 95% of COVID Longhailers (4,940,000) have been impacted financially. This is only polling those employment has been impacted.
- 5% reported being able to work 100%, but were not included in this poll. However, we should still expect financial issues for those working 100% in terms of costs associated with their medical care, which includes, but is not limited to: Medical appointments, imaging, laboratory and blood tests, medications, missed time from work for appointments, travel to appointments, and change of career allowing them to work 100%, potentially resulting in lower wages (some COVID Longhailers have changed careers or positions, as they are no longer able to fulfill the requirements of their former positions, in order to remain employed).

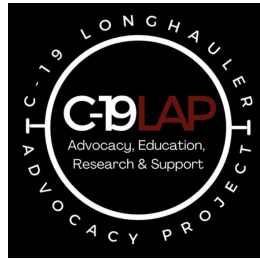
Impacts to Finances Due to Health Issues from Long Covid	% of LH's Impacted	# of LH's Impacted Expanded for Population @ 52M infections
Experiencing financial ruin that w/out assistance, they will never recover from.	48%	2,371,200
Have medical bills over \$5,000	42%	2,074,800
Have filed or are about to file for disability.	41%	2,025,400
Are a Health Care Worker, First Responder/Member of Military, or Educator.	28%	1,383,200
Have had to sell furniture, collectibles, or other valuables to pay bills.	21%	1,037,400
Have exhausted all avenues for assistance and are completely out of resources.	20%	988,000
Multiple members of the household have lost income due to Long COVID.	14%	691,600
Are a single parent who is a Longhailer or is providing care for a Longhailer.	9%	444,600
Have lost or are about to lose their home.	7%	345,800
Have lost or are about to lose their car.	7%	345,800
Have had a relationship end.	7%	345,800



Step 4:

In a poll distributed (December 2021) in the [COVID-19 Longhailer Advocacy Project](#) (376) and [Long Haul COVID Fighters](#) (120), we assessed how many COVID Longhailers (496) were reduced to working limited hours (Part-Time) and how many were completely out of work (OOW) and for how long. Of 496 responses, 76% reported being completely out of work due to Long COVID, while 24% reported being reduced to working Part-Time (PT). It is important to note that these numbers do not reflect people getting better but reflect the waves in which people became ill.

Length of Time Employment Affected	# OOW C-19 LAP	# OOW LHCF	Total # OOW (76%)	% OOW	# Reduced to PT Work C-19 LAP	# Reduced to PT Work LHCF	Total # Reduced to PT Work (24%)	% Reduced to PT Work	% of Longhailers with Loss of Income
3+ Months	34	11	45	12%	7	3	10	8.5%	11
6+ Months	28	5	33	9%	19	6	25	21%	12
9+ Months	43	2	45	12%	7	1	8	7%	11
12+ Months	89	10	99	26%	14	11	25	21%	25
15+ Months	14	10	24	6.5%	2	2	4	3.5%	5.5
18+ Months	47	22	69	18.5%	14	5	19	16%	18
21+ Months	34	19	53	14%	19	5	24	20%	15.5
24+ Months	4	5	9	2%	1	2	3	3%	2
Total	293	84	376		83	37	120		

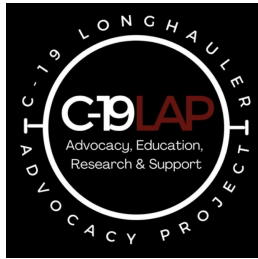


Step 5: Extrapolate out to the national numbers based on documented COVID-19 infection rates (note that Johns Hopkins' and CDC's estimates are triple our numbers used here).

- 5,200,000 Longhaulers (10% of 52M) x .715 of working age= 3,718,000 people
- 3,718,000 x .62 labor participation rate= 2,305,160 people
- 95% (2,189,902) have had changes in employment, resulting in financial issues due to Long Covid.
 - 44% are OOW (1,014,270).
 - 67% of those have been OOW for > 1 year (679,561).
 - 51% have been reduced to working PT (1,175,632).
 - 63% of those have been PT for >1 year (740,648).
 - A total of 1,420,209 Longhaulers (65%) have suffered financially due to employment changes from Long COVID > 1 year.

Months Employment has Been Affected.	% of OOW LH's	# of OOW LH's (full pop)	X .715 (working age) x .62 (labor force participation rate)	% of PT LH's	# of PT LH's (full pop)	X .715 (working age) x .62 (labor force participation rate)	# of LH's with Lost Income
3+	12%	274,560	121,712	8.5%	225,420	99,928	221,640
6+	9%	205,920	91,284	21%	556,920	246,882	338,166
9+	12%	274,560	121,712	7%	185,640	82,294	204,006
12+	26%	594,880	263,710	21%	556,920	246,882	510,592
15+	6.5%	148,720	65,927	3.5%	92,820	41,147	107,074
18+	18.5%	423,280	187,640	16%	424,320	188,101	375,741
21+	14%	320,320	141,997	20%	530,400	235,126	377,123
24+	2%	45,760	20,285	3%	79,560	35,268	55,553
Total		2,288,000	1,014,270		2,652,000	1,175,631	2,189,901

Step 6:



Savings/ Cushion

Many COVID Longhaulers in the U.S. abruptly left the workforce due to health issues with Long COVID, an illness they did not expect or have the ability to plan for. Since the majority of COVID Longhaulers are of working age, many may never have the opportunity to create retirement funds, as many cannot pay basic bills now and may be out of work for months to years.

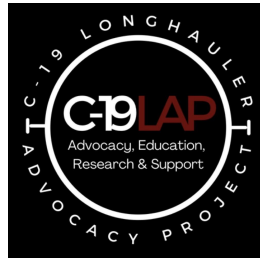
- [69% of Americans have < \\$1,000 in a savings account.](#)
 - [50% of American women have no savings at all.](#)
- [38% of Americans say they can't save any money because their expenses are too high.](#)
- [The average household savings in America is \\$17,135.](#)
 - [75% of Latino and African-American households have < \\$10,000 saved for retirement.](#)

People did not expect to get sick with COVID-19 and become disabled, unable to work in any capacity, have significantly reduced capacity for work, or need to change careers due to new cognitive and/or physical limitations. Conversations about finances ramped up around September 2020 as many of the first wave COVID Longhaulers (infected prior to April 2020) began discussing their loss of savings, navigating the unemployment system, fighting for short and long term disability, and more. The statistics above are staggering and provide an extremely grim view into the future for COVID Longhaulers who do not receive any assistance. 69% of Longhaulers (extracted from national numbers) is 3,588,000, which is an estimate of those who had less than \$1,000 in savings when they lost their jobs indefinitely due to health.

Step 7:

- The [average weekly earning in the U.S](#) is \$1,001/ Week (\$1,000) = \$4,000/ Month.
- Part time work is calculated at \$500/ Week and \$2,000/ month.
- 3+ months means months 3-5, 6+ months means months 6-8, and so on.
- Find Average income per bracket, ie: 3+ months is \$12,000-\$20,000, avg = \$16,000
- Multiply the average income by the number of COVID Longhaulers affected for OOW and then do the same for PT (at 50%, or \$500/wk).

Months Employment has Been Affected.	Average FT Monthly Income For Bracket	OOW LH's	Income Lost by OOW LH's	PT LH's	Income Lost by PT LH's	Income lost to date by LH's (5.2M @ 10%)
3-5	\$16,000	121,712	\$1,947,392,000	99,928	\$799,424,000	\$2,746,816,000
6-8	\$28,000	91,284	\$2,555,952,000	246,882	\$3,456,432,000	\$6,012,384,000
9-11	\$40,000	121,712	\$4,868,480,000	82,294	\$1,645,880,000	\$6,514,360,000
12-14	\$52,000	263,710	\$13,712,920,000	246,882	\$6,419,088,000	\$20,132,008,000
15-17	\$64,000	65,927	\$4,219,328,000	41,147	\$1,316,704,000	\$5,607,024,000
18-20	\$76,000	187,640	\$14,250,640,000	188,101	\$7,147,838,000	\$21,398,478,000
21-23	\$88,000	141,997	\$12,495,912,000	235,126	\$10,345,500,000	\$22,841,412,000
24+	\$96,000	20,285	\$1,947,360,000	35,268	\$1,692,864,000	\$3,640,224,000
Total		1,014,270	\$55,997,984,000	1,175,631	\$32,823,730,000	\$88,819,714,000



Step 8:

Take the income lost by COVID Longhaulers (\$88,819,714,000) and divide it by the estimated 10% of Longhaulers (5,200,000) which is [\\$17.763 lost](#) per Longhailer per year. This is going to be a much easier way to track things over time, now that the above math is completed.

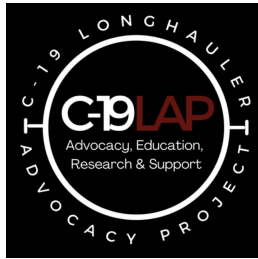
Step 9:

In a July 3, 2021 Poll from the COVID-19 Longhailer Advocacy Project:

- 66% (264/ 399) reported being diagnosed with a form of Dysautonomia
 - (POTS (29%), OI (13.5%), IST (10%), OH (9%), VVS (4.5%))
- 26% (104/399) reported they or their physician suspects Dysautonomia, but they are not formally diagnosed. If even half prove to have Dysautonomia, then more than 75% of COVID Longhaulers develop Dysautonomia.
- 25% (100/399) reported being diagnosed with ME/CFS
- 29% (117/399) reported they or their physician suspects ME/CFS, but they are not formally diagnosed. If even half prove to have ME/CFS, then more than 40% of COVID Longhaulers develop ME/CFS

	Dysautonomia	ME/CFS
Average # of People w/ Disease (70M worldwide/ world pop x US pop)	3,101,000	1,668,000
Average Annual Disease Cost (Using POTS since it has comparative diseases)	77,525,000,000	20.5 Billion
Average Cost per Person	\$25,000	\$12,290
Estimated # of LH's w/ Disease	57% 2,964,000 (8,356,200 CDC #'s)	46% 2,392,000 (6,743,600 CDC #'S)
New Total Yearly Estimate of Patients	6,065,000 (11,457,200 CDC #'s)	4,060,000 (8,411,600 CDC #'S)
New Total Yearly Cost Estimate	\$151,625,000,000 (\$286,430,000,000 CDC #'S)	\$92,612,660,000 (\$103,378,564,000 CDC #'S)

- The healthcare cost per Longhailer is \$17,776 (average disease cost/52M Longhaulers)
- COVID Longhaulers have developed multiple conditions, resulting in higher cost of care due to the multitude of specialists, testing, medications and therapies. The above estimates do not account for income loss, multiple conditions together, or increased levels of disease severity. Current estimates show that [25% of POTS](#) patients and [75% of ME/CFS](#) patients are unable to work.

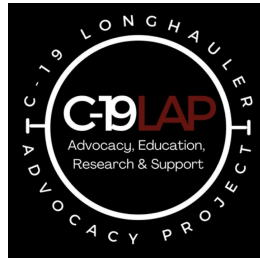


Step 10:

- **Health Costs:** \$18,645 = the average cost of care for POTS and ME/CFS; however, note this can and will be higher if multiple conditions exist, which is the case for most COVID Longhaulers. This real number may be closer to 25,000.
- **Income Loss Costs:** \$17,763 = Total income lost by COVID Longhaulers/ total number of Longhaulers.
- Total \$36,408+ per Longhauler per Year = \$189,321,600,000 (\$533,741,280,000 CDC #'S)

Omicron is adding to Long Covid cases and costs. At 500,000 cases/day (as of 1/5/22), **50,000 people will become COVID Longhaulers each day.** 22,165 of them are working age participating in the workforce. At a cost of \$36,408 per Longhauler per year, we are adding **\$806,983,320 in lost income per day.**

- NIH Dir. Francis Collins said due to [Omicron, cases may rise as high as 1 million/ day.](#) That's 100,000 Longhaulers per day at a cost of \$1,776,300,000 added to the cost per day, if this estimate of potential daily cases proves true.
- It's imperative to note that many Long Covid children need assistance as well.
- It's imperative to note that even asymptomatic and mild COVID-19 cases can lead to Long Covid, in fact, 80-85% of COVID Longhaulers were never hospitalized with COVID-19 and a study in California noted that [32% of their study participants \(Longhaulers\)](#) had asymptomatic infections.
- The notion that vaccinations are enough without masking, social distancing and capacity and travel restrictions is negligent.
- The notion that even if you get COVID if vaccinated you will be okay is false. Even vaccinated people develop Long Covid.
- Information on Long Covid should be utilized as a driver to get people vaccinated, to continue masking, and to make smarter and more responsible decisions. It should be a driver behind mitigation strategies emphasizing the level of disability caused by Long Covid and the long term economic impact of Long Covid, which is more costly and disruptive than short term protective measures.
- The public needs to be educated about Long Covid. We need our Government officials and media to talk about Long Covid, the largest population affected by the pandemic. When people do not understand the risk, they cannot make informed decisions. Our leading government officials, including President Biden, do not speak about Long Covid or warn people of the public health crisis it poses. More needs to be said and done.



Step 11:

Compute increases in assistance programs

Medicaid

Went from 71,032,278 on Medicaid in [July 2019](#) to 83,195,041 in [June 2021](#). That is an increase of 12,162,763.

Food Stamps

Went from 35,702,472 on Food Stamps in [2019](#) to 41,500,107 in [June 2021](#). That is an increase of 5,797,635

SSA

Went from [2,015 in 2019](#), decreased to [1,839 in 2020](#) and numbers for 2021 are not yet available. We expect 2021's numbers to be astronomical, reflecting 2020 COVID Longhaulers' disability application. Only 41% of COVID Longhaulers report having already filed for disability. COVID Longhaulers infected in 2021 have not yet applied.

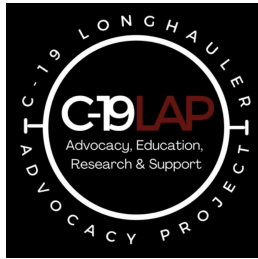
5,200,000 (the 10% who become LH) x .44% the # OOW) x .41% (the # already filed/ about to file for disability) = 938,089

Step 12

Health Care Workers

As of October 2021, the [healthcare workforce](#) had lost more than half a million **workers** since February 2020, of which about 400,000 were in nursing and residential care facilities. Approximately 30% of Longhaulers out of work reported being a health care worker, first responder/members of the military, or educator, making up 3 essential cohorts of workers. If we assign 10% to each field above (we do anticipate HCW's to be a higher percentage). We also know from our poll that 44% of Longhaulers are out of work completely, while 51% have been reduced to working part time. The below numbers apply to each of the three fields mentioned.

- 52,000,000 (total cases) x 10% that become Longhaulers= 5,200,000 LH's (Longhaulers).
- 5,200,000 (Longhaulers) x 10% who are HCW (Healthcare Workers) = 520,000 HCW LH'S
- 520,000 (HCW LH's) x 44% who are OOW (Out of Work) completely= 228,800 HCW LH's OOW
- 520,000 (HCW LH'S) x 51% who are reduced to PT (Part Time) work= 265,200 HCW LH's PT
 - If we take two PT positions to make 1 FT position, this would make 132,600 more HCW LH OOW
- **Total Healthcare Workers with Long COVID out of work completely 228,800- 361,400**
 - Many of these positions will not be returning, consequently causing and prolonging the stress on our healthcare system for years or decades to come, without already being in a pandemic. We have lost a significant number of healthcare providers, first responders and educators to Long COVID, and this is not even including the deaths which would be around 104,000 for each.



Step 13:

Unemployment

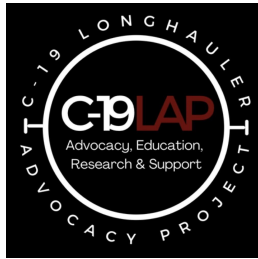
- [In November 2019, there were 11,885,424 people unemployed. In November 2021, there were 13,866,328 people unemployed.](#) That is an increase of **1,980,904 (~2M)**.
- [Of those out of work for >27 weeks:](#) Nov 2019 (20.5% of 11,885,424= 2,436,512) to Nov 2021 (32% of 13,866,328= 4,437,225) leaves an increase of **2,000,713 (2M)** people unemployed long term >27 weeks.
- Our poll shows 892,558 out of work >6 months and 1,075,703/2 part time (divide by 2 to make 1 FT job) = 537,852. Total= **1,430,410 (1.4M)**
 - That makes Longhaulers **10%** of the total number of people unemployed and **71%** of those unemployed >27 weeks

Step 14:

Gender (Workforce, Childcare, Long COVID)

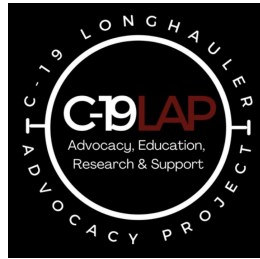
- 6,272,863 people dropped out of the labor force from 2019-2021.
 - The total number of women [out of the workforce](#) increased by 2,971,356 during the pandemic, of which a study from 2020-2021 showed **46%** were Black and Hispanic, representing one-third of the female labor force in the U.S.
 - Women make up ~85% of Longhaulers
 - The number of men out of the workforce increased by 3,301,507 during the pandemic.
 - Men make up ~15% of Longhaulers
 - Total increase of people out of the workforce since 2019 is 6,272,863
 - Longhaulers (16% of LFDO during the pandemic) is 1,014,270 ([Mayo Clinic estimates 1.3M](#)) to 2,859,462 using the [CDC'S numbers](#) which would be similar to the 15 million [Johns Hopkins](#) estimate which at 10% would be at 2,925,780.
- In 2020, ~ one-third (2,090,954) were Full Time workers and parents of children <18 years.
 - It is not a secret that [women](#) are the most likely ones to stay home, quit their jobs or get fired due to childcare related issues, of which the Pandemic caused a lot of with school closures and quarantine guidelines with exposures.
- Annually, since 2011, around 2 Million [Baby Boomers](#) retired. From 2019-2020, 3.2 Million retired, an increase of 1.2 Million.
- There are also caretakers for non-child Longhaulers impacted as well

	Women 2021	Men 2021	Total 52M
2019-2021 Unemployment Rate Increase	3,301,507	2,971,356	6,272,863
Potential Longhaulers (5.2M Longhaulers x .715 x .62 x .44 x (.85 women, .15 men)	862,129	152,141	1,014,270
Estimated % of LH Making up Labor Force Drop Out	26%	5%	16%
1/3 of the Labor Force Drop Out are parents of children <18 (pandemic childcare)			2,090,954
Drop out <u>NOT</u> due to Long COVID or Pandemic Childcare			3,167,653



Data not used in calculations but relevant to the topic

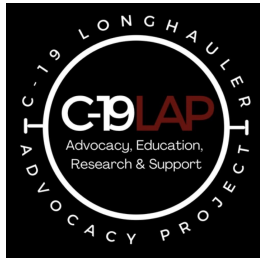
1. **Sept 13, 2021 Poll: [COVID-19 Longhailer Advocacy Project- Assessing the Frequency of Health Issues in Longhailers \(297\) Related to Long COVID.](#)**
 - a. 61% of Longhailers experience constant, everyday symptoms that vary in severity.
 - b. 28% of Longhailers experience some normal, symptom free days followed by relapses/ flares.
 - c. 8% of Longhailers experience some normal, symptom free weeks followed by relapses/ flares.
 - d. 2% of Longhailers experience a normal month or two, symptom free followed by relapses/ flares.
 - e. 1% of Longhailers have recovered 100%, experiencing no symptoms or relapses/ flares.
2. **In the Oct 2020 [Experiences and Needs Study](#) by the COVID-19 Longhailer Advocacy Project:**
 - a. 22% said their Long COVID symptoms were equal to that of their experience with acute COVID.
 - b. 34% said their Long COVID symptoms were more severe than their experience with acute COVID.
3. **Employer-Reported Workplace Illnesses- U.S Department of Labor**
 - a. ["Total reported illness cases more than quadrupled to 544,600 cases, up from 127,200 cases in 2019."](#) This is an increase of 417,400 claims (^328%). "This increase was driven by a nearly 4,000% increase in employer related respiratory illness cases in 2020 at 428,700, up from 10,800 in 2019. If 10% of these new "respiratory cases" aka COVID-19 become Longhailers, that's 41,740 Longhailers.
4. **A recent [US Census Bureau survey](#) estimated that 3.7 million Americans are out of work** because they're either [caring for someone or sick themselves](#) with coronavirus symptoms. The survey also found roughly 2.5 million people aren't working because they're concerned about getting or spreading Covid.
5. **Example of a Long COVID Assistance Program ([LCAP](#))**, since no one else has tried to create anything.



Summary

1. Financial impacts of Long Covid:

- a. 48% reported that they were experiencing financial ruin from which, without assistance, they would not recover.
 - b. 42% percent reported having over \$5,000 in medical bills.
 - c. 21% have had to sell furniture, collectibles and other valuables in order to pay bills.
 - d. 20% said they are completely out of resources.
 - e. 14% have multiple members of the household whose income has been impacted by Long Covid.
 - f. 9% were single parents who are Longhaulers or caring for another Longhailer in the home.
 - g. 7% percent of Longhailers had lost or were about to lose their homes.
 - h. 7% percent of Longhailers had lost or were about to lose their homes.
 - i. 7% percent also reported that their relationship or marriage has ended due to Long COVID, which has a compounding negative impact on the Longhailer's finances.
 - j. 28% were health care workers, first responders, members of the military, or educators, comprising four of the largest essential fields that keep the United States running.
2. **10% of COVID-19 infections become Longhailers.** Documented cases are currently at 52 Million with estimates from the CDC and Johns Hopkins being three times that including undocumented, estimated cases.
3. **95% of Longhailers have had employment impacted**, significantly affecting their finances. 44% are out of work completely, of which 67% have been out of work > 1 year and 51% have been reduced to part work, of which 63% have been reduced for > 1 year. Only 1% are able to work at 100% capacity. 61% of Longhailers have constant everyday symptoms and 28% experience a good/ symptom free day or two.
4. **The current estimated total income lost by Longhailers is \$88,819,714,000**
5. **The total income lost and yearly medical costs puts the cost per Longhailer per year at \$36,408.**
- a. The two most common diagnoses in Longhailers are Dysautonomia at 57% (2,964,000) and ME/CFS at 46% (2,392,000).
 - i. The average yearly cost of these conditions is \$18,645.
 - b. The average income lost per Longhailer/ year is \$17,763
 - c. At 500,000 Cases/ Day (1/5/21), 50,000 more people become Longhailers each day. 22,165 of them are working age participating in the workforce. At a cost of \$36,408 per Longhailer per year, we are adding \$806,983,320 per day.
6. **Benefits program enrollment skyrocketed from 2019 to 2021**
- a. 69% of Americans have < \$1,000 in savings and the average household savings is \$17,135
 - b. Medicaid enrollment increased by 12,162,763
 - c. Food Assistance enrollment increased by 5,797,635

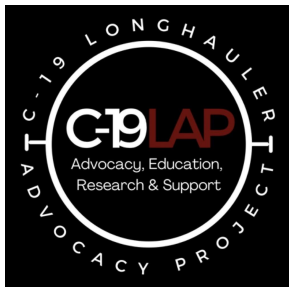


- d. No data is available for Social Security Disability; however, our data shows 41% of Longhaulers, out of the 95% (2,025,400) with employment impacted, have already filed or are about to file for SSD.

7. Labor Force Drop Out

- a. 6,272,863 people dropped out of the labor force from 2019-2021; 2,971,356 women of which 46% were Black or Hispanic, and 3,301,507 men.
 - i. Longhaulers make up 16% (1,014,270) of LFDO during the pandemic.
 - ii. In 2020, one-third (2,090,954) were Full Time workers and parents of children <18 years.
- b. From 2019-2020, 3.2 Million Baby Boomers retired.
- c. There are also caretakers for non-child Longhaulers impacted as well

8. At least 10% (228,000) of Healthcare Workers are Longhaulers.



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