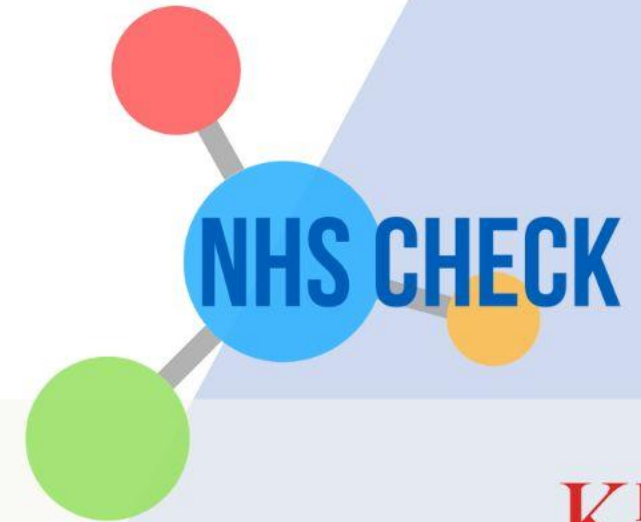


LC CHECK: Long Covid among NHS Staff

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What is Long Covid?

- Long Covid is an umbrella term for the complex medical condition where symptoms of Covid-19 continue after the acute phase of infection.^{1,2}
- There is no agreed upon cause.^{3,4}
- There is also no universal agreement for how long symptoms should continue to be considered Long Covid.
 - Although symptoms for 12+ weeks has become the most popular: NICE define this as Post Covid-19 Syndrome (PCS).¹

Prevalence of Long Covid

- Figures from ONS suggest that over 2,000,000 in the UK had PCS in the first two months of 2023.^{5,6}
 - ~3% of the population and ~9% of all PCR confirmed cases.
- Risk factors of PCS include ⁷:
 - Older age
 - Pre-existing co-morbidities
 - Unvaccinated
 - Female sex
 - Poorer mental health
 - Hospitalization



Lived Experience of Long Covid

- ONS data found that ~78% of people with PCS reported impacts to their daily life due to prolonged symptoms.^{5,6}
 - ~20% said that this ability had been “limited a lot”.
- One UK study found that people with PCS reported higher levels of functional impairment compared to people with mild to moderate stroke.⁸
- Qualitative work found that those with PCS experience fear of unknown prognosis, difficulty accessing services, and stigma.^{9,10}

Long Covid among HCWs



- Healthcare workers (HCWs) are at high risk of Covid-19 due to their work.¹¹
 - HCWs are also likely at high risk of PCS.
- Emerging research highlights that PCS impacts HCWs' physical and mental health.¹²
- Qualitative work has also found additional challenges, including a lack of support from the NHS, managers and colleagues.^{13,14}

Aims of the Current Study

Using data from NHS CHECK, we examined:

1. The demographic, occupational and psychosocial characteristics of HCWs who develop PCS.
2. The prevalence of PCS and the most common symptoms.
3. The risk factors for PCS among HCWs.
4. Sickness absence attributed to PCS among HCWs.

Methods – Sample

- This study includes 5,248 HCWs who reported a previous Covid-19 infection.
- Information on risk factors were collected on the Baseline survey (distributed between April 2020 to January 2021).
- Information on our outcomes were collected 12-month and 32-months after Baseline.
 - We define Long Covid as PCS (symptoms for 12+ weeks)
 - We measure sickness absence by number of days and episodes off

Methods – Data Analysis

- To describe the characteristics of HCW's with PCS, the prevalence of PCS, and sickness absence, we used descriptive statistics.
- To explore risk factors for PCS, we used multi-level logistic regression modelling.
- All data were weighted using Trust-level HR data.
- To account for missing data among the risk factors, we used Multiple Imputation using Chained Equations (MICE)

Methods – PPIE

- We formed a PPIE group of HCWs with experience of PCS.
- The group have met twice to discuss the study, share valuable insights on the lived experience of PCS, and provide input to the analysis plans.
- A member of the PPIE group (Dr. Rachel Ali) will talk about her experiences with PCS at today's conference.

Aim 1: Demographic Characteristics

Variable	Categories	Total NHS CHECK sample	Staff with C-19 Infection	Staff with PCS
		n = 24,137 (%)	n = 5,248 (%)	n = 1,730 (%)
Sex	Female	19,581 (74.1)	4,254 (74.7)	1,451 (78.5)
	Male	4,491 (24.9)	973 (24.5)	267 (21)
	Missing	265 (1)	41 (0.8)	12 (0.5)
Age in years	30 and younger	4,681 (21.3)	754 (16.2)	220 (13.8)
	31–40	5,247 (25)	1,010 (22.8)	304 (21.2)
	41–50	6,000 (22)	1,457 (24.3)	500 (24.8)
	51–60	5,691 (20.7)	1,500 (25.9)	529 (29.4)
	61 and older	1,439 (6.5)	321 (7)	102 (6.3)
	Missing	1,079 (4.5)	206 (3.8)	75 (4.5)
Ethnicity	White	20,507 (75.9)	4,665 (81.2)	1,549 (83)
	Black	1,045 (8)	155 (6.3)	41 (5.3)
	Asian	1,572 (12.1)	242 (9)	72 (8.1)
	Mixed/Multiple ethnic group	593 (1.1)	125 (1.2)	47 (1.2)
	Other ethnic group	224 (2.2)	34 (1.9)	13 (2.1)
	Missing	196 (0.7)	27 (0.4)	8 (0.3)
Relationship status	Single/Divorced	6,304 (26.9)	1,259 (24.3)	409 (24.7)
	Married/Cohabiting	17,592 (72.2)	3,958 (75.2)	1,311 (74.9)
	Missing	241 (0.9)	31 (0.5)	10 (0.4)
Pre-existing respiratory illness	No	21,806 (89.1)	4,370 (82.9)	1,399 (81.1)
	Reported Asthma/COPD	1,227 (5)	313 (5.2)	140 (7)
	Missing	1,584 (5.9)	645 (11.9)	213 (11.9)

Aim 1: Occupational Characteristics

Variable	Categories	Total NHS	Staff with	Staff with
		CHECK sample n = 24,137 (%)	C-19 Infection n = 5,248 (%)	PCS n = 1,730 (%)
Job role	Nurse	6,127 (29.7)	1,376 (30.7)	528 (34.9)
	Doctor	1,727 (9.8)	340 (8.3)	81 (5.8)
	Other clinical	7,338 (32.1)	1,583 (32.3)	522 (32.1)
	Non-clinical	8,744 (27.7)	1,910 (28.1)	589 (26.7)
	Missing	201 (0.7)	39 (0.6)	10 (0.5)
Income	NHS Band 5 or below	7,599 (27.7)	1,643 (27)	570 (28.9)
	NHS Band 6 or above	12,570 (54)	2,814 (57)	931 (57.6)
	Missing	3,968 (18.3)	791 (16)	229 (13.5)
Contact with Covid 19 patients	No contact	8,200 (27.1)	1,526 (22.3)	360 (17.4)
	Contact	10,309 (51.7)	2,325 (52.6)	891 (56.7)
	Missing	5,628 (21.2)	1,397 (25.1)	479 (25.9)
Perceived Access to PPE	Inadequate access	1,709 (8.3)	351 (7.9)	147 (10.1)
	Adequate access	17,130 (73.8)	3,566 (69.2)	1,166 (67.2)
	Non-applicable	2,839 (8.6)	564 (8.7)	158 (8.2)
	Missing	2,459 (9.3)	767 (14.2)	269 (14.5)
Confidence in workplace infection control policies	Inadequate confidence	8,211 (37.7)	1,656 (35.1)	598 (36.5)
	Adequate confidence	13,406 (53)	2,824 (50.9)	885 (49.5)
	Missing	2,520 (9.3)	768 (14)	247 (14)

Aim 1: Mental Health Information

Variable	Categories	Total NHS	Staff with	Staff with PCS
		CHECK sample n = 24,137 (%)	C-19 Infection n = 5,248 (%)	Staff with PCS n = 1,730 (%)
Probable depression	PHQ-9 score <10	8,694 (35.3)	2,140 (40.7)	620 (36.3)
	PHQ-9 score ≥10	3,302 (14.3)	890 (17.6)	400 (24)
	Missing	12,141 (50.4)	2,218 (41.7)	710 (39.7)
Probable generalized anxiety disorder	GAD-7 score <10	9,319 (38)	2,372 (45.2)	736 (43.1)
	GAD-7 score ≥10	2,716 (11.8)	673 (13.4)	293 (17.8)
	Missing	12,102 (50.2)	2,203 (41.4)	701 (39.1)
Probable burnout	BAT-12 score <2.96	10,000 (41.1)	2,512 (48.1)	798 (46.4)
	BAT-12 score ≥2.96	1,820 (7.7)	486 (9.5)	212 (13.1)
	Missing	12,317 (51.2)	2,250 (42.4)	720 (40.5)
Probable post-traumatic stress disorder	PCL-6 score <14	9,158 (36.9)	2,303 (43.2)	699 (39.6)
	PCL-6 score ≥14	2,825 (12.6)	730 (14.9)	319 (20.3)
	Missing	12,154 (50.5)	2,215 (41.9)	712 (40.1)
Probable alcohol misuse	AUDIT-C score <8	10,010 (42)	2,534 (49)	854 (51)
	AUDIT-C score ≥8	1,396 (5.3)	337 (6.2)	110 (6)
	Missing	12,731 (52.7)	2,377 (44.8)	766 (43)

Aim 2: Prevalence of PCS

- 33.6% of the staff who had Covid-19 reported symptoms that lasted for 12 or more weeks (1,730 of 5,248).
- Among staff with PCS, the most common symptoms were:
 - Fatigue (51.4%)
 - Insomnia (35.2%)
 - Shortness of breath (28.6%)
 - Change of taste/smell (23.4%)
 - Difficulty concentrating (36.7%)
 - Anxiety/Depression (33%)
 - Memory loss/confusion (27%)
 - Joint pain (23%)

Aim 2: Prevalence of PCS

- In addition, some staff with PCS reported further clinical complications that developed after Covid-19 infection:
 - Depression (7.4%)
 - Anxiety (7%)
 - Diabetes (7%)
 - Post-Viral Fatigue Syndrome (7.2%)
 - Heart complications (4.9%)

Aim 3: Risk Factors for PCS

- The following variables were used to explore risk factors:

Demographic Factors

- Sex
- Age
- Ethnicity
- Relationship status

Physical/Mental Health

- Pre-existing respiratory condition (asthma/COPD)
- Probable mental health disorders (depression, anxiety, burnout, and PTSD)
- Alcohol misuse

Occupational Factors

- Job role
- Income
- Contact with Covid-19 patients
- Access to PPE
- Confidence in infection control policies
- Burden on NHS
- Trust (Level 2)

Aim 3: Risk Factors for PCS

Variables	Categories	Odds of PCS		Variables	Categories	Odds of PCS	
		aOR	95% CI			aOR	95% CI
Sex	Female (Ref)	1	—	Relationship status	Single/Divorced (Ref)	1	—
	Male	0.78	[0.65, 0.92]		Married/Cohabiting	1.07	[0.85, 1.35]
Age in years	30 and younger (Ref)	1	—	Depression (PHQ-9)	PHQ-9 score <10 (Ref)	1	—
	31–40	1.56	[0.84, 2.89]		PHQ-9 score ≥10	1.92	[1.51, 2.44]
	41–50	1.81	[0.98, 3.33]	Alcohol use disorder (AUDIT-C)	AUDIT-C score <8 (Ref)	1	—
	51–60	1.92	[1.39, 2.66]		AUDIT-C score ≥8	0.93	[0.65, 1.35]
	61 and older	1.52	[0.92, 2.5]	Pre-existing respiratory illness	No (Ref)	1	—
Ethnicity	White (Ref)	1	—		Reported Asthma/COPD	1.55	[1.12, 2.14]
	Black	0.74	[0.3, 1.82]	Income	AfC Band 5 or below (Ref)	1	—
	Asian	0.69	[0.34, 1.4]		AfC Band 6 or higher	0.86	[0.64, 1.15]
	Mixed/Multiple ethnic group	0.93	[0.45, 1.89]	Contact with Covid-19 patients	No contact (Ref)	1	—
	Other ethnic group	1.13	[0.47, 2.77]		Contact	1.7	[1.3, 2.22]
Work role	Doctor (Ref)	1	—	Access to PPE	Inadequate access (Ref)	1	—
	Nurse	0.65	[0.41, 1.04]		Adequate access	0.59	[0.33, 1.04]
	Other clinical	0.76	[0.57, 1.01]		Non-applicable	0.71	[0.36, 1.4]
	Non-clinical	0.78	[0.61, 0.99]	Confidence in workplace infection control policies	Inadequate confidence (Ref)	1	—
			Adequate confidence		0.99	[0.84, 1.16]	

PCS = Post Covid-19 Syndrome (symptoms lasting for 12 or more weeks after the onset of the acute Covid-19 infection), aOR = Adjusted Odds Ratio, 95% CI = 95% Confidence Intervals for the effect of each variable on the outcome

Aim 3: Risk Factors for PCS

- Sensitivity analyses for this aim include:
 - Using the remaining mental health variables (anxiety, GAD-7; post-traumatic stress disorder, PCL-6; and burnout, BAT-12) as our mental health risk factors.
 - Using the broad NICE definition of LC (symptoms for 4+ weeks) as the outcome.
 - Looking only at the data collected at 12-months and 32-months separately.
- These analyses have not indicated any significant deviations.

Aim 4: Sickness Absence due to PCS



- 1,628 (92.7%) of staff with PCS reported sickness absence.
- The number of days off significantly reduced between our data collection points.
 - At 12-months, the median number of days off was 14 (IQR 10 – 30) & 20.8% reported long-term sickness absence.
 - At 32-months, the median number of days off was 7 (IQR 4 – 14) & 4% reported long-term sickness absence.



STRENGTHS

WEAKNESSES

- Use of longitudinal risk factors.
- Use of administrative data to create weights (ethnicity, age, sex and clinical role).
- Clinical and non-clinical staff.
- Comparable characteristics to NHS workforce.

- Self-report data.
- Lack of information on the severity and longevity of PCS.
- Multiple imputation may have influenced results.
- Two risk factors (vaccination and hospitalization) erroneously excluded from second outcome data collection point.

To conclude

- Approximately one third of HCWs who reported a Covid-19 infection in the NHS CHECK cohort experienced symptoms for 12 or more weeks.
- We found that indications of poorer mental health at the beginning of the pandemic is a risk factor for PCS among HCWs.
- We also found that female sex, older age, a pre-existing respiratory illness and a lack of confidence in infection control policies are risk factors.
- We found evidence of a reduction in sickness absence taken by staff with PCS despite the presence of ongoing symptoms.

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