

Smoking and socioeconomic factors linked to acute exacerbations of COPD: analysis from an Asthma + Lung UK survey

Parris J Williams ,¹ Andrew Cumella,² Keir Elmslie James Philip ,¹ Anthony A Laverty ,³ Nicholas S Hopkinson ¹

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¹National Heart and Lung Institute, Imperial College London, London, UK

²Asthma+Lung UK, London, UK

³Department Primary Care and Public Health, Imperial College London School of Public Health, London, UK

Correspondence to
Professor Nicholas S Hopkinson;
n.hopkinson@ic.ac.uk

ABSTRACT

Background Understanding the factors driving acute exacerbations of chronic obstructive pulmonary disease (COPD) is key to reducing their impact on human health and well-being.

Methods 5997 people with COPD, mean 66 years, 64% female, completed an online survey between December 2020 and May 2021 about living with COPD, developed by the charity Asthma + Lung UK.

Results The 3731 (62.2%) survey participants reporting frequent (≥ 2 /year) exacerbations were more likely to smoke (adjusted OR (AOR) 1.70, 95% CI 1.470 to 1.98), have lower annual household income (\leq £20 000 (AOR 1.72, 95% CI 1.36 to 2.17), live in a cold and damp home (AOR 1.78, 95% CI 1.50 to 2.11) and report previous occupational exposure to dust, fumes and chemicals. Smokers were more likely to report attending hospital to manage their most recent acute exacerbation of COPD compared with ex-smokers (AOR 1.25, 95% CI 0.99 to 1.59).

Discussion Strategies to improve COPD outcomes must address issues of deprivation and social justice.

INTRODUCTION

Chronic obstructive pulmonary disease is highly prevalent, with at least 1.3 million people diagnosed in the UK, and rates increasing over the past decade. COPD is known to be less common in affluent populations. The gap in COPD mortality has widened dramatically in recent years, being five times higher in the lowest income decile than the highest in 2020 compared with twice as high in 2010.^{1 2} Acute exacerbations of COPD (AECOPD) in patients lead to a higher risk of hospitalisation and mortality; increased exposure to infectious pathogens, environmental pollutants and poor physical fitness are established risk factors.³ More than 50% of the cost of COPD is attributable to exacerbation management,³ so prevention is an important issue for sustainability of health-care systems as well as for individual patients.

WHAT IS ALREADY KNOWN ON THIS TOPIC

⇒ Acute exacerbations of COPD are costly both in terms of patient quality of life and health service cost. Infections, poor cardiorespiratory fitness and environmental pollutants are known drivers of COPD exacerbations.

WHAT THIS STUDY ADDS

⇒ This study adds to growing evidence that socioeconomic factors including poor housing conditions and low incomes may increase the frequency of acute exacerbations among people with COPD in the UK.

HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE OR POLICY

⇒ This study highlights the need for more research and funding, addressing the harmful effects of social deprivation on COPD health within the UK.

Information about the impact of disparities in wealth and other specific housing, social and environmental factors is needed to drive efforts to address this.

We therefore made use of data from an online survey, conducted to investigate COPD patient experience, to examine which factors were associated with an increased risk of AECOPD.

METHODS

The paper describes a secondary analysis using data from an online Asthma + Lung UK annual COPD survey conducted from December 2020 to May 2021.⁴ This was advertised via social media, direct email messages to the charity's known supporter base and via its website. The full survey is available online (online supplemental file 1). Participants completing the questionnaire consented to their anonymised data being used for research purposes.

Statistical analysis

Descriptive results are presented as number (%) and mean (SD) as appropriate. Logistic regression results are presented as adjusted ORs (AOR) with 95% CI. Responses to the survey question, 'In the past 12 months, how many exacerbations or "flare-ups" of your COPD symptoms have you had?' were grouped into 0–1 (infrequent) and ≥ 2 (frequent exacerbators), in line with current treatment guidelines. We also compared participants who did or did not report requiring hospitalisation for an AECOPD in the preceding year. All regression analyses included age, gender and smoking status as independent covariates. Ex-smokers, no previous occupational exposure to airborne pollutants, warm and dry housing and household income $\geq \pounds 40\,000$ were used as reference categories for the multiple regression analyses.

RESULTS

The initial sample included 8232 responses. After cleaning for outliers, removing duplicate and incomplete

responses, 5997 responses remained and were analysed. The sample population was majority female (64.4%), white ethnicity (99%) and ex-smokers (80.7%). Mean age was 66.2 (8.9) years (table 1).

The 3731 frequent exacerbators were more likely to be current smokers (AOR: 1.70, 95% CI 1.47 to 1.98), have low annual household (HH) incomes ($\leq \pounds 20\,000$ (AOR: 1.72, 95% CI 1.36 to 2.17), live in cold and damp housing (AOR: 1.78, 95% CI 1.50 to 2.11), report previous occupational exposure to airborne pollutants (AOR: 1.12, 95% CI 1.00 to 1.25) and be male (AOR: 1.32, 95% CI 1.17 to 1.49) (table 2, figure 1).

Among the 532 (8.9%) of survey respondents who reported a hospital attendance to manage their most recent AECOPD, 117 (22%) were current smokers. Smokers were more likely to report hospitalisation compared with ex-smokers (AOR: 1.25, 95% CI 0.99 to 1.59). Both low income and cold and damp housing covariates were numerically higher in those reporting

Table 1 Sociodemographic characteristics of the survey respondents sample including percentage of the sample demographics in each exacerbation group

Demographics	All participants n=5997	≥ 2 exacerbations in past 12 months n=3731	0–1 exacerbations in the past 12 months n=2266
Age (mean SD)	66.2 \pm (8.9)	–	–
Age started smoking (mean SD)	15.7 \pm (4.9)	–	–
Female	3858 (64.3%)	2338 (62.6%)	1520 (67.0%)
Male	2139 (35.7%)	1393 (37.4%)	746 (33.0%)
Ethnicity			
White	5910 (98.5%)	3696 (99.0%)	2179 (97.0%)
Mixed	43 (0.7%)	21 (0.6%)	22 (1.0%)
Asian, Asian British	36 (0.4%)	12 (0.3%)	24 (1.1%)
Black, black British	8 (0.13%)	2 (0.1%)	6 (0.9%)
Household income			
$\leq \pounds 20\,000$	3061 (51.0%)	2037 (54.5%)	1025 (45.2%)
$\pounds 20\,000$ – $\pounds 30\,000$	1229 (20.5%)	722 (19.3%)	507 (22.3%)
$\pounds 30\,001$ – $\pounds 40\,000$	450 (7.5%)	250 (6.7%)	200 (8.8%)
$\geq \pounds 40\,001$	343 (5.7%)	183 (5.1%)	160 (7.2%)
Rather not say	913 (15.2%)	539 (14.4%)	374 (16.5%)
Smoking status			
Ex-smoker	4845 (80.8%)	2874 (77.1%)	1971 (86.9%)
Current	1152 (19.2%)	857 (22.9%)	295 (13.1%)
Housing conditions			
Warm and dry	4494 (74.9%)	2642 (70.8%)	1852 (82.2%)
Cold and damp	809 (13.4%)	591 (15.8%)	215 (10.0%)
Cold	470 (7.8%)	339 (9.0%)	77 (4.4%)
Damp	227 (3.9%)	159 (4.4%)	68 (3.4%)
Occupational exposure to dust, fumes and chemicals			
Yes	3010 (50.1%)	1965 (52.6%)	1045 (46.1%)
No	2987 (49.9%)	1766 (47.4%)	1221 (53.9%)

Table 2 Factors associated with increased number of exacerbations among survey population

Variable	Model 1: age, sex tobacco and income	Model 2: age, sex, tobacco and housing	Model 3: all variables
	OR and CI	OR and CI	OR and CI
Gender female	Ref	Ref	Ref
Male	1.38 (1.23 to 1.54)	1.32 (1.18 to 1.48)	1.32 (1.17 to 1.49)
Age	0.97 (0.96 to 0.97)	0.97 (0.96 to 0.98)	0.97 (0.96 to 0.98)
Smoking status (current)	1.68 (1.45 to 1.95)	1.77 (1.53 to 2.06)	1.70 (1.47 to 1.98)
Ex-smokers	Ref	Ref	Ref
Occupational exposure to dust, fume and chemicals	–	–	1.12 (1.00 to 1.25)
No occupational exposure to dust, fumes and chemicals	–	–	Ref
Age started smoking	–	–	1.001 (0.990 to 1.012)
Housing: warm and dry	–	Ref	Ref
Housing: cold and damp	–	1.83 (1.54 to 2.17)	1.78 (1.50 to 2.11)
Housing: cold	–	1.69 (1.37 to 2.09)	1.61 (1.30 to 2.00)
Housing damp	–	1.52 (1.13 to 2.05)	1.49 (1.01 to 2.00)
HH income: ≤£20 000	1.82 (1.45 to 2.30)	–	1.72 (1.36 to 2.17)
HH income: £20 001– £30 000	1.32 (1.03 to 1.68)	–	1.27 (0.99 to 1.63)
HH income: £30 001– £40 000	1.11 (0.83 to 1.48)	–	1.08 (0.81 to 1.44)
HH income: ≥£40 000	Ref	–	Ref
HH income: rather not say	1.46 (1.13 to 1.88)	–	1.40 (1.08 to 1.82)

Bold type indicates significance at ≤0.05 level.
HH, household.

hospitalisation, but these differences were not statistically significant (online supplemental file 1).

DISCUSSION

This large online survey of the experience of people living with COPD provides important contemporary data on the role that socioeconomic factors may play

in AECOPD. We found that low income, poor housing quality, past occupational exposure to airborne pollutants and current smoking were all significantly associated with higher AECOPD frequency. Current smoking was also associated with an increased risk of AECOPD requiring hospitalisation.

A key objective in COPD care is to reduce the frequency of AECOPD, both to improve patients' quality of life and to limit as far as possible the avoidable use of finite healthcare resources. However, there is a huge unmet care need among patients with COPD within the UK, with a large proportion of patients missing out on important COPD care such as self-management plans, vaccinations, pulmonary rehabilitation and smoking cessation,^{5,6} all of which are proven interventions for reducing AECOPD. The COVID-19 pandemic has worsened this unmet need further, as people with respiratory disease have had trouble accessing healthcare.^{7–9} Asthma + Lung UK survey data show that over 75% COPD patients report not receiving basic care during 2020/2021.⁴ Switching to a digital by default model, further risks excluding deprived and older patients.

Despite the known link between housing quality and health (particularly excess winter deaths), and the 2015 National Institute for Healthcare and Excellence guidance that recommends that healthcare providers assess housing quality and make referrals where necessary,¹⁰ the effect of housing quality on COPD health has been little studied. Current guidance for housing temperature in

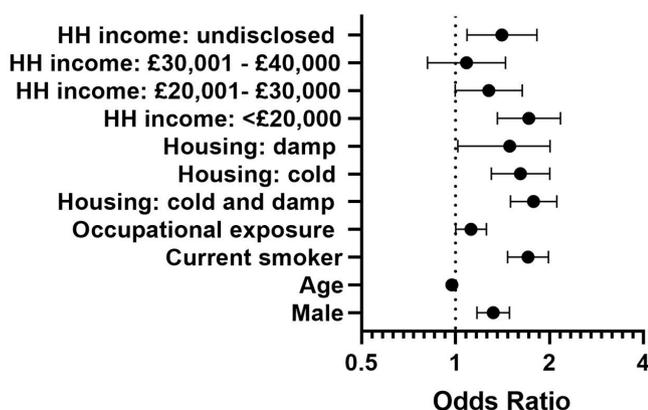


Figure 1 Sociodemographic, housing and annual household (HH) income factors (AOR, 95%CI) associated with ≥ 2 exacerbations in the past 12 months among the survey population. Occupational exposure = yes to occupational exposure to dust, fumes and chemicals. Ex-smokers, no occupational exposure, warm and dry housing and HH income $>£40,000$ were used as reference categories for the analysis.

the winter is a minimum of 18°C,¹⁰ but this may not be sufficient for people with COPD. A 2008 paper reported that greater time spent with an indoor temperature $\geq 21^\circ\text{C}$ was associated with better self-reported health status in people with COPD.¹¹ Of note, data from the Office for Health Improvement and Disparities show that in 2018 2.4 million people in England were living in fuel poverty.¹ More than 70% of survey participants fell below the UK median household income of £31 004, and the impact of housing conditions on AECOPD reflects that, though the link with cold / damp housing was independent of income.

It is well established that austerity policies, which have reduced both social and healthcare support, have had significant impact on the most vulnerable in society, in particular people living with long-term health conditions.¹² Our findings underline this, with poorer survey respondents almost twice as likely to be in the frequent exacerbator group. This is especially relevant as fuel poverty is increasing, and the results illustrate several aspects of the structural violence (where ‘violence is built into the structure and shows up as unequal life chances’¹³), to which people with COPD are subject.¹⁴

The survey also highlights an important link between smoking, AECOPD frequency and hospitalisations, adding further urgency to the need for strategies to deliver the UK government’s smokefree2030 ambition.^{15 16}

The survey design has some limitations. First, it required some digital literacy, which may have excluded a portion of the COPD population in the UK. Second, there is likely to have been some degree of responder and recall bias. Third, we did not independently validate household income or housing conditions, and we were unable to triangulate index of deprivation as we did not have postcode data. However, we believe that the use of household income as a measure of SES is a robust approach. In addition, the survey population was overwhelmingly white, so caution is needed extrapolating to other ethnic groups, and positive efforts to capture their experience are needed in the future. Finally, the studied cohort are likely to be individuals who were motivated to engage with online surveys and the Asthma + Lung UK charity. These factors may limit generalisability of the findings and may have led to an underestimate of the true impact on SES and housing quality on AECOPD.

In conclusion, these data add to the growing evidence that socioeconomic status, in particular poor housing conditions, are linked to increased frequency of AECOPD. Addressing social deprivation, with a multi-agency approach at national and local government level and across health and social care is essential to reduce inequalities and treat the causes of the causes of AECOPD in the UK. In doing so, this will improve the sustainability of healthcare and improve the lives of people with COPD across the UK.

Twitter Nicholas S Hopkinson @COPDdoc

Contributors NSH, PW, AC and AL designed the study. PW and AL analysed the data and PJW produced the first draft to which all authors contributed. All authors have reviewed and approved the final version. NSH is the guarantor.

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Competing interests NSH is Chair of Action on Smoking and Health and Medical Director of Asthma + Lung UK. AL is a Trustee of Action on Smoking and Health. Other authors have no conflict of interest to declare.

Patient and public involvement Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

Patient consent for publication Not applicable.

Ethics approval Ethical approval was granted by the Imperial College Research Governance and Integrity Team (ICREC Ref: 20IC6625). Participants gave informed consent to participate in the study before taking part.

Provenance and peer review Not commissioned; externally peer reviewed.

Data availability statement Data are available on reasonable request. Anonymised research data will be shared with third parties via request to Asthma + Lung UK.

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ORCID iDs

Parris J Williams <http://orcid.org/0000-0001-8027-1879>
 Keir Elmslie James Philip <http://orcid.org/0000-0001-9614-3580>
 Anthony A Lavery <http://orcid.org/0000-0003-1318-8439>
 Nicholas S Hopkinson <http://orcid.org/0000-0003-3235-0454>

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Smoking and socio-economic factors linked to acute exacerbations of COPD: results from an Asthma + Lung UK survey.

ONLINE SUPPLEMENT

Parris J Williams¹, Andrew Cumella², Keir EJ Philip¹, Anthony A. Lavery³, Nicholas S Hopkinson¹.

¹National Heart and Lung Institute, Imperial College

²Asthma + Lung UK

³Public Health Policy Evaluation Unit, School of Public Health, Imperial College London, London, UK

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Additional Methods

Model 1: Household income

Table 1. Smoking and annual household income factors associated with increased AECOPD

Variable	Odds Ratio	95%CI	P Value
Gender (Male)	1.38	1.23-1.54	0.00
Smoking	1.68	1.45-1.95	0.00
Age	0.97	0.96-0.97	0.00
< £20,000	1.82	1.45-2.30	0.00
£20,001- £30,000	1.32	1.03- 1.68	0.004
£30,001- £40,000	1.11	0.83-1.48	0.14
More than £40,000	Ref	Ref	Ref
Rather not say	1.46	1.13-1.88	0.00

In the above regression model, we categorised annual household income into 5 groups; group 1: <£20,000, group 2: £20,000- £30,000, group 3: £30,001- £40,000, group 4: rather not say and group 5: more than £40,000. The reference category we used in this model was group 5 (>£40,000). Survey respondents were more likely to report higher AECOP frequency if they were male (OR 1.138, 95%CI 1.23-1.54, p= 0.00), current smokers (OR: 1.68, 95%CI 1.45-1.95), and had lower annual HH incomes <£20,000 (OR: 1.82, 95%CI 1.45-2.30, p= 0.00), £20,001- £30,000 (OR: 1.32, 95%CI 1.03- 1.68, p= 0.004) or didn't disclose their income (OR: 1.46, 95%CI 1.13-1.88, p=0.00).

Model 2: Housing Quality

Table 2. Smoking and housing quality factors associated with increased AECOPD

Variable	Odds ratio	95%CI	P-value
Gender (male)	1.324	1.183-1.483	0.00
Age	0.975	0.969-0.981	0.00
Smoking	1.779	1.531-2.066	0.00
Good Housing	Ref	Ref	Ref
Cold and Damp housing	1.833	1.547-2.171	0.00
Cold housing	1.695	1.370-2.098	0.00
Damp Housing	1.528	1.138-2.053	0.005

In this model survey respondents were more likely to report >2 exacerbations over the past year if they were male (OR: 1.324, 95% CI 1.183-1.483 p= 0.00) and were a current smoker (OR: 1.778, 95% CI 1.531-2.066 p= 0.00). To observe if housing conditions influenced exacerbations we used 'Good Housing' as the reference category in this model. Survey responders were more likely to report more than 2 exacerbations in the past year if they lived in cold and damp housing (OR: 1.833, 95%CI 1.547-2.171 p=0.00), cold housing (OR: 1.695, 95%CI 1.370-2.098 p = 0.00) and damp housing (1.528, 95% CI 1.138-2.053 p =0.005) compared to living in good housing conditions.

Frequency of AECOPD grouped.

For the original analysis we grouped AECOPD frequencies into two categories 1= 0-1 AECOPD and 2= ≥ 2 AECOPD. The graph below gives a visual representation of the frequencies of AECOPD collapsing ≥ 6 into one group.

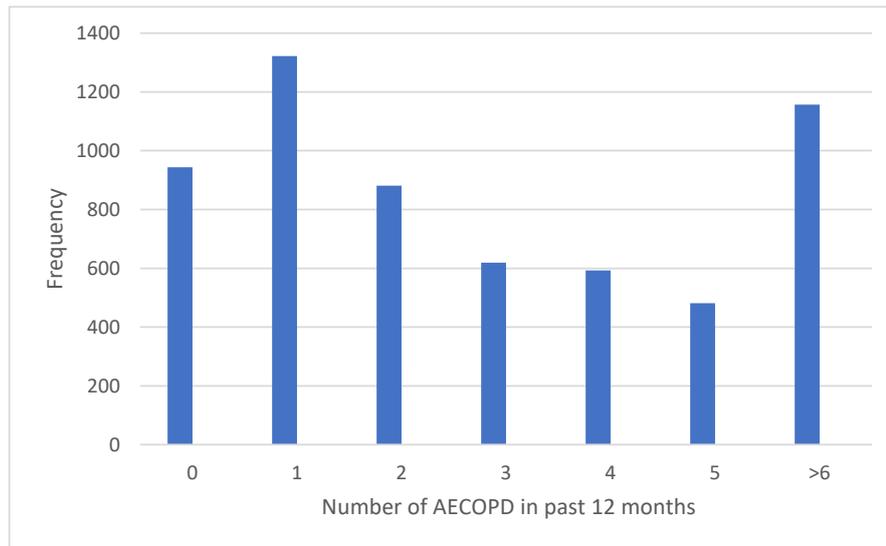


Figure 1. Frequencies of AECOPD in the past 12 months in sample population.

Smoking and socio-economic factors associated with hospitalisations of AECOPD

We ran another logistic regression model to determine if smoking and socio-economic factors may contribute to hospitalisations of AECOPD within the survey population. We took the survey question “how did you manage your most recent flare up?” and coded it into two binary numeric categories 0= No hospitalisation 1= hospitalisation. Patients reporting 0 exacerbations were excluded from the analysis.

Table 1. Smoking and socio-economic factors associated with attendance to hospital to manage recent AECOPD.

Variable	Odds Ratio	95%CI	P value
Gender (Male)	0.94	0.77- 1.14	0.53
Age	0.99	0.99-1.00	0.70
Smoking (current)	1.25	0.99-1.59	0.05
Age started	1.00	0.99-1.02	0.40
Housing: Warm and Dry	Ref	Ref	Ref
Housing: cold and damp	1.08	0.84-1.40	0.50
Housing: Cold	0.95	0.68-1.33	0.78
Housing: Damp	0.74	0.455-1.22	0.24
Occupational Exposure of dust, fumes or chemicals	1.04	0.87-1.25	0.63
<£20,000	1.13	0.76-1.73	0.53
£20,001- £30,001	0.93	0.63-1.44	0.75
£30,001- £40,000	0.55	0.31-1.004	0.05
>£40,000	Ref	Ref	Ref
Rather not say	1.12	0.70-1.72	0.66

Survey respondents were more likely to report a hospital admission to manage their AECOPD if they were current smokers (AOR: 1.25, 95%CI 0.99-1.59, $p=0.05$), HH incomes $>£20,000$, occupational exposure to airborne pollutants, living in a cold and damp house and age started smoking we also covariates moderately associated with hospitalisations, however not statically significant. Interestingly survey respondents reporting their annual HH income as £30,001-£40,001 were less likely to report attending hospital compared to those reporting their annual HH income as $>£40,000$ (AOR 0.55, 95%CI 0.31-1.00, $p= 0.05$).

Survey questions.

Further results are available in the Failing on the Fundamentals report from Asthma + Lung UK can be found [Here](#) the questions asked in the survey to gain the data used in this report.

1. What is your age?
[respondent typed in numerical value]

2. What nation do you live in?
 - England

 - Northern Ireland

 - Scotland

 - Wales

3. [for respondents in England] Which region do you live in?
 - East Midlands

 - East of England

 - London

 - North East

 - North West

 - South East

 - South West

 - West Midlands

 - Yorkshire and Humber

4. When were you diagnosed with COPD?
 - In the last 6 months

 - 6 months – a year ago

 - 1 year – 2 years ago

 - 2 years – 5 years ago

 - 5 years – 10 years ago

 - Over 10 years ago

 - I am waiting for my diagnosis

5. How long did you experience COPD symptoms before talking about it with your GP or another healthcare professional?
Common symptoms include increasing breathlessness, a persistent chesty cough with phlegm that does not go away, frequent chest infections and persistent wheezing.
 - One month or less
 - 1-2 months
 - 3-6 months
 - 6 months – a year
 - A year – two years
 - More than two years
 - I don't remember

6. How long did you have to wait between talking about your COPD symptoms with your GP or healthcare professional, to receiving a formal diagnosis?
 - One month or less
 - 1-2 months
 - 3-6 months
 - 6 months – a year
 - A year – two years
 - More than two years
 - I don't remember

7. What were the main barriers to getting a diagnosis?
 - Difficulty in getting appointments
 - Diagnosis tests (such as spirometry) not being available
 - Not knowing what the signs of potential COPD were
 - Not wanting to know if I had COPD
 - I was misdiagnosed at first, and it took a while to get correctly diagnoses with COPD
 - I was sent away by my GP when I first mentioned it
 - My GP thought I had a chest infection or cough at first
 - I do not recall there being any barriers
 - Concern that I might have lung cancer
 - Other

8. Thinking about when you were diagnosed, did you have any of the following performed to confirm your diagnosis?
 - Spirometry testing
 - A peak flow reading
 - A chest x-ray
 - A CT scan
 - Blood tests
 - I was asked about smoking
 - We had a discussion about smoking
 - We had a discussion about my symptoms
 - We had a discussion about my work history
 - I don't remember
 - None of the above

9. After diagnosis, were you given any written materials to support your management of your COPD? This could include leaflets or links to the BLF website, for instance.
 - Yes
 - No
 - Don't remember

10. After your diagnosis, did you feel you had enough knowledge and support to manage your COPD?
 - Yes
 - No
 - Don't remember

11. Are you currently working?
 - Yes
 - No

12. Have you worked in a job where you were exposed to dust, fumes or chemicals? This may include working in a factory, using cleaning products or working in farming.
 - Yes

- No

13. [if yes to above] In the job(s) where you were exposed to dust, fumes or chemicals, do you think that you had all the protective equipment that you needed to stay safe?

- Yes
- No

14. [if yes to working with dust etc] Do you think your job made your condition worse?

- Yes
- No

15. When do you get out of breath?

- I'm not troubled by being out of breath, except on strenuous exercise
- I'm short of breath when hurrying on level ground or walking up a slight hill
- I walk slower than most people on the level, stop after a mile or so, or stop after 15 minutes of walking at my own pace
- I stop for breath after walking about 100 yards or after a few minutes on level ground
- I'm too breathless to leave the house, or breathless when dressing and undressing

16. Have you had a planned review or planned check-up (sometimes called an annual review) of your COPD with your doctor or nurse in the last year?

- Yes - it was done face to face
- Yes - it was done over the phone / via videocall
- Yes - it was done via text
- No
- Not sure

17. Do you smoke?

- Yes
- I used to, but have given up
- I have never smoked

18. How old were you when you had your first cigarette?

[respondent typed in numerical value]

19. [for those who used to smoke] Did you give up smoking after being diagnosed with COPD?

- Yes

- No
20. [for those who smoke, or have smoked in past 12 months] In the past 12 months, have you been offered treatment and support to stop smoking?
- Yes
 - No
21. [current smokers or used to] Since being diagnosed with COPD, have you tried to stop smoking?
- Yes
 - No
 - I wasn't smoking at the time I was diagnosed
22. What inspired you to quit smoking?
- Being diagnosed with COPD
 - Other health reasons
 - Stop Smoking campaigns (such as Stoptober)
 - My family and/or friends
 - Protecting others
 - Saving money
 - Other
23. In the past 12 months, have you had a flu jab?
- Yes
 - No
 - Don't know
24. Since diagnosis with COPD, have you had a pneumonia vaccine jab? This is also called the pneumococcal vaccine, or PPV.
- Yes
 - No
 - Don't know
25. Have you had pulmonary rehabilitation as part of your care?
Pulmonary rehabilitation (PR) is a programme of exercise and education designed for people living with COPD and other respiratory conditions
- Yes
 - No
26. [if no to above] Have you ever been offered the chance to do pulmonary rehabilitation?
- Yes
 - No

27. [if yes to PR] Has doing pulmonary rehabilitation improved your COPD symptoms?
- Yes
 - No
 - I don't know
28. [if yes to doing PR] Would you recommend pulmonary rehabilitation to others with COPD?
- Yes
 - No
 - I don't know
29. Do you currently have a COPD self-management plan?
- Yes
 - No
 - Don't know
30. [if yes to above] Did you have a chance to have a say about what was in the self-management plan? This could have been done via a conversation with your healthcare professional
- Yes
 - No
 - I can't remember
31. In the past 12 months, have you discussed any other long term medical conditions that you have in relation to your COPD management with your doctor or nurse?
- Yes
 - No
 - Don't know
 - I don't have any other long term conditions
32. In the past 12 months, how many exacerbations or 'flare-up' of your COPD symptoms have you had?
- By this, we mean you suffered from some of these warning signs:*
- *Your breathlessness gets worse, and this goes on for some time without getting better*
 - *You cough more*
 - *You produce more sputum*
 - *There's a change in the colour and consistency of your sputum*
- [respondent typed in numerical value]
- how did you manage your most recent flare up?
 - I managed it myself without informing a healthcare professional
 - I managed it myself and informed a healthcare professional
 - I was treated at home by a GP or paramedic
 - I was treated over the phone e.g. NHS 111
 - I went to hospital/ A&E by myself

- VI. I went to hospital/ A&E in an ambulance
- VII. I went to my GP
- VIII. I went to my pharmacist

33. Do you know what to do if your COPD symptoms get worse (you have a flare-up)?

- Yes
- No

34. How would you rate the general public's understanding of what COPD is?

- Very good
- Good
- Average
- Poor
- Very poor

35. How would you rate the understanding of living with COPD from the following groups:

- Your friends and family
 - i. Very good
 - ii. Good
 - iii. Average
 - iv. Poor
 - v. Very poor
- Healthcare professionals
 - i. Very good
 - ii. Good
 - iii. Average
 - iv. Poor
 - v. Very poor
- The general public
 - i. Very good
 - ii. Good
 - iii. Average
 - iv. Poor
 - v. Very poor
- The media
 - i. Very good
 - ii. Good

iii. Average

iv. Poor

v. Very poor

36. What activities have you had to do less of because of your COPD? [multiple choice]

- Work
- Seeing friends
- Seeing family
- Volunteering
- Doing childcare
- Doing other sorts of care for other family or friends
- Going on holiday
- Other [free text]

37. What activities have you had to stop doing because of your COPD? [multiple choice]

- Work
- Seeing friends
- Seeing family
- Volunteering
- Doing childcare
- Doing other sorts of care for other family or friends
- Going on holiday
- Other [free text]

38. Is your COPD affected because where you live is:

- Cold?
- Damp?
- Both cold and damp?

39. Have you ever felt that there is a stigma attached to living with COPD?

- Yes
- No
- Don't know

40. Do you feel you have faced any stigma or discrimination due to having COPD?

- Yes
- No

41. [if yes to above] Can you describe what took place?

[free text]

42. How has being diagnosed with and living with COPD impacted upon your mental health?

- It has had no impact
- It has made it much better

- It has made it a bit better
- It has made it a bit worse
- It has made it much worse

43. Which of the following applies to care for your mental health since you were diagnosed with COPD? [multiple choice]

- I have spoken to my family and/or friends about it
- I have spoken to my GP about it
- I have been diagnosed with a new mental health condition
- I have received a new prescription for my mental health
- I have been referred to a specialist for mental health treatment
- I have not needed mental health care
- Other