

# The Cost of Breathing: Financial situation of women with asthma in England

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## Introduction

The aim of this dissertation is to explore the financial situation of people with asthma in England and provide initial analysis of how working-aged men and women with asthma earn income, compared to their peers who do not suffer from asthma. Using data from The Health Survey for England from 2018 (referred to as HSE 2018 from now on), I will show that people with asthma earn less than people without asthma, and receive a higher number of working age benefits, but do not have a higher rate of unemployment. However, analysis split by gender shows that these adverse effects are generally experienced by women, with men not being significantly affected. I will then argue that improved sick pay and sick leave provision could improve outcomes, drawing on existing disability scholarship, as well as consider broader implications for people with other chronic health conditions.

Given the relative lack of existing academic literature relating to people with asthma as a social group, this study has been designed as an introductory exploration, with the goal of finding whether people with asthma experience loss of income, and how the loss occurs. I have also provided an outline of areas for future research, which would be necessary in order to provide a more comprehensive picture of how asthma impacts the finances of people who live with it.

## What is asthma?

Asthma is a common, chronic health condition which presents as inflammation in the patient's airways. Main symptoms are coughing, wheezing and breathlessness, and they can deteriorate rapidly and temporarily, which is commonly known as an asthma attack, if a patient gets exposed to a trigger (NHS, 2021). Some common triggers include allergies, pollution, physical exertion, and respiratory infections, but an asthma attack can also be caused by strong perfume, a chemical smell, or even the patient's own sex hormones (NHS, 2021). Triggers are individual to each person; even if some are more common than others, there is no single trigger that would affect every person with asthma. People with asthma are generally advised to identify and avoid their triggers as part of managing their condition. It is estimated that 5.4 million people of all ages and genders in the UK suffer from asthma (*What Is Asthma?*, n.d.).

While there is no cure for asthma, a vast array of medications is available to manage and improve symptoms. Most common therapy includes prescribing two inhalers: one to be used daily with the purpose of improving the general condition of the airways, commonly known as a preventer, and one to be used ad hoc to relieve breathing problems as they arise, known as a reliever (NHS, 2021). There are also other treatments available, including different types of inhalers, as well as tablets. At the time of writing, people with asthma do not qualify for a medical exemption from prescription charges (NHS Business Services Authority, n.d.), though some might still be eligible for free prescriptions for example due to age, being on benefits, or suffering from another health condition.

## Why asthma?

This study discusses the financial situation of people with asthma, with particular focus on women, as I have found that they are more severely impacted. The financial aspect of asthma has, to my knowledge, not been widely studied to date, perhaps because asthma does not usually make people unable to work in the long term, which renders the cost less visible. This does not mean that there is no cost, especially when one considers that people often live with asthma for decades. As stated above, asthma affects approximately 5.4 million people in the UK, which constitutes 8% of the population according to the latest estimates (Office for National Statistics, 2022). This in itself makes it worth studying. Moreover, respiratory conditions overall are considered to be on the rise due to pollution and climate change; already 1 in 5 people in the UK live with a lung condition, and respiratory problems cause 1 in 3 deaths (NHS England, 2019), which means that management of

long-term conditions and accessibility for people with respiratory problems will only become more pressing, both from economic and public health perspectives.

The prevalence of asthma alone would make studying how it affects the finances of people who live with it worthwhile, but I propose that there is also a broader application. Asthma is a great example of a chronic health condition that affects people of all ages, and is serious enough to require careful, long-term management, but usually not so serious that it takes people out of paid employment. This means that its financial cost is not easily traceable through studying disability benefits or long-term unemployment, and yet it does have a cost, both to the state and to people who live with the condition. Of course, people with asthma face some unique challenges, for example related to encountering their triggers in their place of employment, but I expect that my recommendations will be broadly applicable not only to them, but also to other people who manage long-term health conditions while remaining in employment. More detailed research into such conditions (for example diabetes, endometriosis or depression, to name a few) would be needed to gain insights into specifics of the financial situation of people who live with them; however, since the key barriers I have identified based on HSE 2018 and existing literature seem to relate to sick pay provision and workplace management of sickness, rather than to any circumstances specific to asthma, there is a good reason to pose that my policy recommendations could benefit people with other chronic conditions as well.

### Research question

In light of these considerations, my main research question for this dissertation is: What is the financial situation of people with asthma compared to people without asthma? In addition, I will also consider the financial situation of women with asthma compared to women without asthma, and the financial situation of men with asthma compared to men without asthma, in order to explore how gender and ill health can interact to create circumstances that go beyond what can be explained by gender or ill health in isolation.

For the purpose of this study, I will define people with asthma as people who have self-reported to have received an asthma diagnosis from a doctor. While this is an imperfect definition, because there might be people who suffer from asthma but have not been able to access medical care or diagnosis, I have chosen it because it mitigates an important risk of underreporting due to mild symptoms. People with mild or seasonal asthma might not consider themselves “truly” asthmatic due to shame or stigma, or simply because what they experience does not fit the popular image of a person with asthma. Asking about a formal diagnosis helps to make the question more neutral and factual, which has the potential to make it easier to answer truthfully.

Financial situation is a complex and fluid concept, which can include such varied aspects as income (on its own or relative to cost of living), ownership of assets, family wealth, number of dependents, debts and regular expenditure. As, to my knowledge, the financial situation of people with asthma has not been systematically studied to date, I have opted for a fairly simple and narrow definition of financial situation, and I will consider household income, employment status, receipt of benefits and home ownership. The purpose of this is to establish a baseline that can then be built on in future research, which can hopefully explore this topic further, especially on expenditure; I have described this in more detail in the Future Research section of the Conclusion.

## Literature review

### Women with asthma

As already mentioned, asthma is a very common respiratory condition, and as such, it attracted a broad array of research into its physiology, causes and treatments. Of course, medical literature is predominantly focused on what causes asthma or asthma attacks, and how to relieve symptoms, not on its social impacts, but it still provides an essential framework of information that helps guide the interpretation of social phenomena observed in the data. As outlined in the introduction, asthma usually presents as a series of exacerbations with periods of relatively good health in between (NHS, 2021). It is also worth noting that, while the above is a common pattern, there is a lot of variety of symptoms between individual patients; in extreme cases, people might experience very severe symptoms every day for extended periods, but it is also possible for some people to not experience any symptoms for years (NHS, 2021).

The part of medical literature most relevant to this study is a substantial body of work exploring social and environmental factors for asthma, which usually focuses on prevalence of asthma in various groups, for example economically disadvantaged people (Temam et al., 2019; Cox, 2017), people from specific ethnic groups (Jessop et al., 2017), or women (Poinasamy & Khan, 2022). For women specifically, there is a consensus that they suffer from asthma more often than men do, and that they are also more likely to have severe asthma (Poinasamy & Khan, 2022). Reasons for this are not fully clear at the time of writing, though a theory that female sex hormones could be to blame is gaining traction (Poinasamy & Khan, 2022). There is also evidence that some environmental factors might disproportionately affect women (Singh et al., 2020), but to my knowledge, no such causes have been identified in the UK so far. Despite evidence that women are more affected by asthma, most research focusing on them as a group in a more detailed way is concentrated around issues of pregnancy and childbirth (see for example Turkeltaub et al., 2019; Chaiprom et al., 2021), leaving other aspects relatively unexplored.

As mentioned above, there is a significant gap in existing research when it comes to experiences of women with asthma, and ways in which the condition affects their daily lives beyond symptoms and adherence to medical advice. Even in medical literature, the topic of women with asthma is considered under-researched, so it is not surprising that this subject has attracted even less interest in the area of social research. Timmermans and Freidin (2007) offered an interesting insight into how asthma management affects daily life, and how much work, and therefore possible cost, goes into living with asthma, but as their study focuses on mothers of children with asthma, rather than adult women managing their own conditions, their findings cannot be extrapolated directly.

In light of the gap in literature outlined above, this study seeks to provide an exploratory first glance at the financial situation of women with asthma and contribute to the existing body of research by painting a broad strokes picture of how women with asthma earn income, as well as identifying areas for further research.

### Social model of disability

Despite the lack of research into the social aspect of asthma, there is a wealth of academic literature on the social dimension of disability, or ill health more broadly. For the purpose of this dissertation, I have focused on social model of disability as most applicable to explaining my findings.

Social model of disability is a theoretical framework designed to position discourse about disability as an issue of social barriers and accommodations, rather than limitations physically inherent to specific health conditions. Social model of disability emerged as part of British disability activism of the 1970s

and 1980s, and it was rooted in grassroots organizers' frustration with mainstream narratives surrounding disability at the time; their main criticism was around prominence of non-disabled voices and highly individualized approach emphasizing physical limitations and personal responsibility. Mike Oliver is credited with coining the term itself. Vic Finkelstein was another prominent scholar and activist heavily involved in popularizing and developing this theory (Shakespeare, 2013; Barnes, 2019).

While asthma is not considered a disability apart from the most severe cases, this model is still very useful in guiding my approach, because one of its goals was to create an inclusive framework for guiding health-related public policy. Traditionally, disability (or, broader, ill health) would have been talked about in terms of limitations and ways in which individuals can overcome them, sometimes at great personal cost. In contrast, social model of disability proposes looking at society as a complex system in which various accessibility needs are or are not met. Following that, people whose needs are not being accommodated are labelled as disabled. According to this approach, society makes a decision about which needs to accommodate, and the goal of good policy-making should be to find ways that enable people with various health conditions to participate, rather than expecting those people to overcome physical barriers so they can fit into the system created with the needs of able-bodied people in mind.

The various mask mandates introduced during the Covid-19 pandemic were a good example of a recent policy created in accordance with the principles of social model of disability for people with asthma, though I acknowledge it was not designed specifically to accommodate them, but to manage a public health emergency. While recent research shows that Covid-19 was not more dangerous for people with asthma than for other members of the public (Laorden et al.), masks limited the spread of all common respiratory infections, especially in the winter, which made it easier for people with asthma to participate in social and professional activities. Mask mandates were a public health measure that created a more accessible environment for people with asthma, while providing a smaller but welcome benefit of less inconvenience related to seasonal colds and flu to everyone ("COVID-19 Precautions Reduce Flu Cases," 2020).

This study does not aim to contribute to further developing the theoretical framework of social model of disability; rather, the goal is to use existing theory to help focus analysis and policy recommendations, and avoid proposing solutions that have the potential to alienate people with asthma or negatively impact their health. The goal is not to find individual strategies that would help people with asthma succeed in the workplace as it is, but to challenge the British sick pay and sick leave system and consider how it could be redesigned to be more inclusive overall.

### Gender and disability – intersectional lens

Intersectionality is a term introduced in research related to equality and social justice. It is used to describe the challenges faced by people who experience multiple forms of social disadvantage at the same time, and poses that those challenges resulting from existing on the intersection of different axes of oppression are unique phenomena that are more than simply the sum of challenges experienced by each separate group that an individual belongs to (Hill Collins & Bilge, 2016).

As with social model of disability, this dissertation draws on intersectional approaches to guide interpretation of findings. Disability scholars have shown that for women, ill health correlates with unemployment, underemployment, lower income, less workplace autonomy, and higher levels of stress. They have also pointed out that issues experienced by disabled women can be directly linked to the dominant philosophy of work (Brown & Moloney, 2018), which is in line with how social model of disability describes the way ill health is turned into a social problem. While social model of

disability has been helpful in proposing policy solutions, intersectional approach has directed my thinking in identifying problems by looking at unique challenges faced by women with asthma, rather than considering their gender and health separately.

## Research design

### Hypotheses

This study uses five variables from HSE2018 to explore the financial situation of people with asthma: joint household income, employment status, number of working age benefits, number of disability benefits and housing tenure. To test whether men and women experience the intersection of gender and ill health differently, data was split into two groups by gender (men and women respectively; there are no non-binary or agender participants recorded in the data set), and two hypotheses were tested for each variable. I decided to do this, rather than simply include gender as a control in regression analysis, to rule out gender pay gap as a confounding variable; comparing women to women and men to men helps shine a light on how asthma works within each group.

The hypotheses are:

H1: Women with asthma live in households with lower incomes than women without asthma.

H2: Men with asthma live in households with lower income than men without asthma.

H3: Women with asthma are less likely to be employed than women without asthma.

H4: Men with asthma are less likely to be employed than men without asthma.

H5: Women with asthma receive a higher number of working age benefits than women without asthma.

H6: Men with asthma receive a higher number of working age benefits than men without asthma.

H7: Women with asthma receive a higher number of disability benefits than women without asthma.

H8: Men with asthma receive a higher number of disability benefits than men without asthma.

H9: Women with asthma are less likely to own their homes (outright or with a mortgage) than women without asthma.

H10: Men with asthma are less likely to own their homes (outright or with a mortgage) than men without asthma.

### The Health Survey for England 2018

This study uses data from The Health Survey for England from 2018, an annual survey carried out by National Statistics for NHS Digital. The survey was carried out on a representative sample of private households in England, which resulted in responses from 8,178 adults and 2,072 children. It was delivered in two stages: first, all participants were interviewed, then 4,825 adults and 1,103 children had a follow-up visit from nurses who collected samples and measurements. As this analysis focuses on socio-economic variables, which are all included in the first stage, it uses the recommended weighting for interview data (wt\_int) throughout.

As this study seeks to explore the relationship between asthma and income, it only includes participants aged between 16 and 64 years old. While every health condition is associated with a cost (including but not limited to medications and medical equipment), and a piece of research focusing on expenditure could legitimately include participants of all ages, income is more complex.

There is some evidence to suggest that respiratory conditions could be more prevalent and severe in lower income people regardless of age, due to a variety of environmental factors (Temam et al., 2019; Cox, 2017), but there are certain factors, such as exacerbations caused by exposure to pathogens and chemicals in the workplace, or navigating sick leave and sick pay, that only apply to working-age people. Additionally, while it could be argued that lower income could contribute to worse health outcomes in people of all ages, the reverse is not necessarily true; apart from the most severe cases (such as a parent needing to give up work to become a full-time carer, or a retired person who is receiving a lower pension because they had not been working for long periods of time due to disability), a child's or a retired person's asthma does not directly lead to loss of household income. Therefore, I have limited this study to working-age participants only, as those younger and older do not, in principle, rely on their current ability to perform various tasks to support themselves financially.

At the time of writing, 2018 was the most recent edition in which participants were asked about their asthma diagnosis, as asthma is not included in the core questionnaire repeated every year. An obvious drawback of using older data is that I will not be able to account for how Covid-19 pandemic impacted the lives of asthma patients. However, recent studies suggest that, despite initial fears that led to people with asthma being advised to shield in the UK in 2020, asthma was not a risk factor for a severe Covid-19 infection (Laorden et al.). Of course, Covid-19 still had an impact on the general population, and I think it would be worthwhile to compare the 2018 findings to a future survey to explore how the pandemic impacted people with asthma in particular. On a balance, until such future survey is carried out, the sample size, reach and methodological rigor of The Health Survey for England 2018 makes it a better source of information than a more recent but smaller survey, given that the impact of Covid-19 on asthma patients is expected to be no larger than on the general population. It is also worthwhile, while newer data is not available, to establish a pre-Covid baseline that later data could be compared to in order to test whether social impact of the pandemic on people with asthma was the same as on the general population, in line with its physical impact discussed above.

## Methods

This study uses ordinary least squares (OLS) regression for ordinal dependent variables and binary logic regression for binary dependent variables to test the ten hypotheses outlined above. For each of the five key variables (joint household income, employment status, number of working age benefits, number of disability benefits, housing tenure), a set of two calculations (one for men, one for women) was performed, with the key variable as the dependent variable, and an official asthma diagnosis as the independent variable, controlling for age, marital status, ethnic origin, and education level. For comparison, the same calculations were also repeated on the full data set without splitting into groups by gender.

The survey does not contain information about any genders other than male or female, and does not make it clear whether trans individuals were asked to state their gender, or sex assigned at birth. According to 2021 census, trans people, non-binary people and people of other genders make up 0.5% of the UK population (Office for National Statistics, 2023). Assuming that they are represented in HSE 2018 at a similar rate, unknown distribution of their responses among the binary gender groups in the survey is not likely to significantly impact this study, but it does represent a regrettable loss of additional insights, as trans status would be a useful control in regression analysis when exploring the intersection of gender and ill health.



Analyzed together, these variables form a fairly comprehensive picture of the participants' economic situations. Since (as is common in surveys in which participants' income is not the main focus of intended analysis) income was only recorded as joint household income, as opposed to each individual's earnings, data relating to employment status and receipt of benefits helps create a fuller picture of each individual irrespective of their larger household. Looking at housing tenure can serve two functions: it is the only variable in the data set offering any insight into asthma patients' expenditure, and it can, though in very broad terms, be used as a proxy for class. The latter has some grounding in the literature relating to British housing market (Ansell & Cansunar, 2021), as people who are from more affluent backgrounds are more likely to afford a down payment, and thus to be home owners or have mortgages. This tendency is useful to consider when interpreting the results, but as no other information about class was recorded in the data set, it needs to be taken with caution.

Joint household income is presented in 27 brackets, starting from £5,200 or less, and ending with £150,000 or more per annum. Brackets are spaced at intervals of £2,600 up until £36,400, then at £5,200 between £36,400 and £52,000, then one interval of £8,000 from £52,000 and £60,000, and £10,000 intervals up until £150,000. This does not correspond with minimum wage thresholds or tax rate thresholds from 2018/19 (HM Revenue & Customs).

Employment is a categorical variable, in which respondents could choose from pre-defined categories. As the purpose of my analysis was to examine the likelihood of respondents being employed, as opposed to detailed analysis of various types of unemployment, I have recoded this variable into a binary variable, leaving "In paid employment or self-employed (or temporarily away)" as was, and grouping people who were in education, waiting to start a job they had already secured, looking for paid work, intending to look for paid work, doing unpaid work, unable to work, retired, and looking after their homes or families into a single "unemployed" variable. This allowed me to capture people's employment status in a clear, straightforward way, without losing any information that is relevant to my research question. The only relevant detail lost is number of people who were permanently unable to work (321) presented as a distinct group, but as disability benefits form a separate part of this study, which gives a more granular view of types of support accessed by respondents, trying to preserve this group in the employment variable would not have added value to the analysis.

It was also possible to measure employment by taking an existing binary variable in which people were asked whether they were receiving any income from employment. The number of people who said yes was similar in both cases (5090 in the recalculated binary variable, compared to 5206 in the existing binary variable), so I have decided to use the recalculated variable, as the question used to create it asked respondents to specify their activity in the last 7 days, and setting a clear time frame is recommended as one of the ways to improve accuracy and obtain more comparable responses (Bryman, 2012). Additionally, since activities were itemized in the original question, choosing this option meant I had control over which activities to classify as employment or lack of employment in my analysis.

HSE 2018 treats all working age and disability benefits as binary variables; for each specific benefit, respondents could state whether they are in receipt of it. The survey listed 11 working age benefits and five disability benefits, presented in a table below together with the number of working age respondents claiming them. Eight of the working age benefits could only be claimed by people who were experiencing some form of financial hardship, defined as earning an income below a certain threshold, having savings below a certain threshold, working fewer than a certain number of hours

each week, or a combination of thereof (Gov.UK, 2018). They were marked with an asterisk (\*) on the list.

Working age benefit	Number of respondents claiming the benefit	Disability benefit	Number of respondents claiming the benefit
Job-Seekers Allowance*	65	Attendance Allowance	21
Employment and Support Allowance*	350	Disability Living Allowance– care component	241
Income Support*	127	Disability Living Allowance – mobility component	158
Pension Credit*	22	Personal Independence Payment – care component	341
Working Tax Credit*	373	Personal Independence Payment – mobility component	237
Child Tax Credit	756		
Child Benefit	2236		
Housing Benefit*	517		
Council Tax Benefit / Reduction*	514		
Universal Credit*	124		
Other state benefits	336		

Table 1: Number of claimants of each benefit listed in HSE 2018

As I was more interested in the scale of support required, not in receipt of specific benefits (especially since, at the time of writing, some of the working age benefits have been discontinued and rolled into Universal Credit, meaning that prevalence of various legacy benefits is of limited relevance), I have calculated a combined Working Age Benefit variable and combined Disability Benefit variable, which captures how many of each category of benefits each respondent was receiving. It is worth noting that for Employment and Support Allowance, ill health was one of the eligibility criteria, but since the survey classified it as a working age benefit, and it also has eligibility criteria related to income, it was more appropriate to keep it in the working age benefits category.

The overarching purpose behind capturing the number of benefits each responded was receiving was to supplement information about income and employment. Monetary value of benefits is usually low relative to cost of living, and eligibility criteria often include not working, working a small number of hours, earning below a relatively low income threshold, or having little savings, which means that being on a higher number of benefits (working age or disability) indicates a level of financial strife. Where a benefit is not means-tested, such as Child Benefit, it indicates a higher level of expected expenditure in comparison to a household with no dependents. Additionally, disability benefits analyzed in isolation help gain a measure of how often ill health is severe enough as to make maintaining employment challenging – though it is worth noting that when people with asthma claim disability benefits, it is not necessarily due to their asthma, as comorbidities might be playing a part.

The home ownership variable is a categorical variable capturing various types of renting, ownership and free-of-charge living that respondents could choose from. As I was predominantly interested in whether respondents were well-off enough to get on the housing ladder, I have recoded this variable into a binary variable, grouping people who owned their homes outright and people who were still paying off mortgages into the “home owner” category, and people who were renting into “renter” category. The number of people in shared ownership schemes or living rent-free were small enough (44 and 64 respectively) that excluding them from the analysis made no material difference. If the goal was to focus more on expenditure, and capture whether respondents had a substantial housing payment to make every month, it would have been better to group renters and mortgage holders together as a “paying for housing” category, and keep people who own their homes outright as “home owners”. I have decided to not use this measure of expenditure in my study because without other information about expenditure (especially health-related expenses, such as medications and medical devices) its contribution to the findings would have been very limited. However, the regression table including this variant of home ownership variable is available in the appendix.

### Limitations

This study has two key challenges that partially limit the extent of its conclusions: a causality issue and an expenditure issue. I will discuss them here as limitations, but it is important to note that, while resolving them was not possible within the scope of this study, they are possible to resolve within larger future projects. I will address this aspect of them in the “Future research” section of this dissertation.

The first limitation is establishing causality. While I am arguing that women with asthma earn less at least to some extent because of their asthma, the discussion is complicated by the fact that underlying causes of asthma are currently not known (NHS, 2021), making it impossible to conclusively disprove that poverty might be causing asthma, at least within the scope of this study. There is some evidence that could be used to argue that asthma is not caused by factors related to poverty; for example, a study by Cox (2017) found that people who lived in areas with higher levels of PM2.5 were less likely to suffer from asthma. However, living in an area with poor air quality is only one marker of poverty, so this study in isolation is not sufficient to draw a firm conclusion.

What is known is that poverty makes asthma management more challenging, and can lead to higher levels of uncontrolled asthma (Temam et al., 2019). Lower paid jobs can also put people at risk by exposing them to triggers at a high rate (Lipinska-Ojrzanowska et al., 2016). This would indicate that improving the income discrepancy between women with and without asthma would improve health outcomes regardless of underlying causes of the condition, by reducing the number of asthma attacks. In light of this, and the fact that I have controlled for other factors commonly impacting income in women (such as age, ethnic origin, education and marital status), I believe that existing literature supports the conclusion that lower income in women with asthma is caused at least in part by lack of accommodations for their condition to a level sufficient for making policy recommendations, acknowledging that it would not be sufficient for designing medical interventions. The fact that having fewer resources leads to negative health outcomes for people with asthma makes this assertion less risky; even if the causal link between asthma and income proves to be more complex in the future, providing people with asthma with accommodations leading to reduction in income disparity would still lead to improvement in health outcomes overall.

The second limitation is expenditure. While establishing a correlation between asthma and income, employment, benefits and home ownership was sufficient to draw conclusions about sick leave, sick pay and sickness absence management, the scope of this study does not cover asthma patients’

expenditure to an extent that would be necessary in order to present a holistic image of their financial situation. For completeness, it is important to mention that people with asthma bear direct costs because of their condition, including but not limited to prescription charges for medications and spacers<sup>1</sup>, or equipment such as air purifiers. A separate, likely qualitative study would be required to explore how high these costs are, what goods and services are purchased, and whether these expenses are compensated by savings in other areas.

## Findings

Regression analysis of the full data set (without a gender split) showed that in all five variables investigated, people with asthma had significant worse outcomes than their counterparts without asthma: they were likely to earn less, more likely to be unemployed, likely to be on a higher number of benefits (both working age and disability) and less likely to own their homes. Analysis split by gender showed that women had worse outcomes than the general population when it came to income level, receipt of benefits and home ownership. For likelihood to be employed, odds ratio for women only is not statistically significant. When it comes to men, all coefficients and odds ratios are not statistically significant, with the exception of number of disability benefits. Men with asthma are slightly but significantly more likely to be on a higher number of disability benefits than other men, though their outcome is still not significantly different from income reported by men without asthma.

## Income

People with asthma interviewed for HSE 2018 were likely to have a joint household income lower by 0.7 of a bracket, controlling for age, marital status, ethnic origin and education level. This translates into a difference in income between £1,820 a year in lowest income brackets to £7,000 a year in highest income brackets. It is worth noting that this represents total household income, and not individual income, which means that, for married or cohabitating people (who, as the regression table below shows, generally tend to bring in larger incomes than their single, divorced, separated or widowed counterparts), it is not possible to tell whether one or both partners have asthma, and in case of the former, what is the portion of the income brought in by the asthmatic partner. This would suggest that the coefficient would likely be even higher if the survey collected information on individual income; there is no reason to suspect that people with asthma are significantly more likely to form households with other people with asthma, and if households with asthma tend to earn less, then it is reasonable to infer that at least in some cases, healthy partners make up some of the financial shortfall in households where one adult suffers from asthma.

After splitting the respondents by gender, it is possible to reject null hypothesis for H1 and conclude that women with asthma live in households with lower income than women without asthma. The same is not true for H2; data shows no significant difference in income between men with and without asthma. Moreover, the negative coefficient for women is higher than for all genders, putting the joint household income of women with asthma at close to one bracket lower than women without asthma after controlling for age, marital status, ethnic origin and education level. As mentioned in the methods section, this difference in outcomes cannot be attributed to the gender pay gap, because I am comparing the outcome for women with asthma as relative to other women and outcome for men with asthma as relative to other men. The difference in income can be partially attributed to lower level of employment in people with asthma, but, as shown in the Employment

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<sup>1</sup> A spacer is a medical device consisting of a plastic tube that has a mouthpiece on one end, and a slot to attach an inhaler on the other. It is widely recommended to people who use inhalers regularly ("Spacers | Asthma + Lung UK"). Its purpose is to make it easier for the patient to inhale the entire dose of their medicine.

section below, men and women with asthma are equally likely to be employed relative to their healthy counterparts, whereas when it comes to income, only women with asthma seem to be negatively impacted. This suggests that, while there are people with asthma who have lower household incomes due to health-related unemployment, there is also a cohort of women with asthma who achieve a lower income despite being employed. A similar cohort of employed but underpaid men with asthma was not observed.

	All genders		Women		Men	
	Coeff.	S.E.	Coeff.	S.E.	Coeff.	S.E.
(Constant)	12.965***	0.399	12.942***	0.565	13.054***	0.565
Asthma diagnosed by doctor	-0.696**	0.207	-0.993***	0.284	-0.354	0.304
Age group	-0.240***	0.035	-0.239***	0.050	-0.249***	0.051
Cohabiting	-1.276***	0.233	-1.424***	0.329	-1.178***	0.331
Divorced	-5.231***	0.412	-5.482***	0.507	-4.528***	0.703
Separated	-5.806***	0.632	-6.949***	0.811	-4.217***	0.999
Single	-4.776***	0.235	-4.738***	0.333	-4.863***	0.334
Widowed	-6.491***	0.926	-6.654***	1.034	-5.563**	2.006
Asian	-3.947***	0.284	-3.609***	0.422	-4.277***	0.386
Black	-3.281***	0.438	-3.214***	0.573	-3.217***	0.678
Mixed / multiple ethnic backgrounds	-0.477	0.551	-0.090	0.741	-0.985	0.821
Other ethnic background	-3.368***	0.788	-2.911**	1.064	-3.875**	1.167
Education below degree	2.785***	0.262	2.480***	0.374	3.066***	0.369
Education: degree or equivalent	6.013***	0.276	5.961***	0.390	6.081***	0.391
N	5196		2582		2615	
R-Squared	0.242		0.267		0.223	

\*p<0.05, \*\* p<0.01, \*\*\* p<0.001

Table 2: Regression model of income level with and without gender split

## Employment

According to data collected in HSE 2018, people with asthma are 16% less likely to be employed than people without asthma. A small but significant negative impact on employment was expected, given the way asthma presents on a population level; it varies from very mild to severe, and might in some cases be serious enough to make taking on paid work impossible (NHS, 2021).

HSE 2018 does not offer a good measure of condition severity, focusing instead on symptom control, which arguably is much more useful from the perspective of a healthcare provider: participants were asked whether they had symptoms in the last 12 months, and when they said no, whether it was achieved with the help of medication. While lack of symptoms is a good individual outcome, it is

possible for a person regardless of severity of the condition to suffer no symptoms through a combination of a strict adherence to their medication regime and diligent avoidance of triggers. Equally, a person might have very mild asthma, but still experience symptoms from time to time, either because they do not take their medications as prescribed, or because their triggers are not possible to avoid. This means that it would be incorrect to infer that people who experienced symptoms in the last 12 months are also people with severe asthma.

In light of this, it is not possible to conclude based solely on the survey that the 16% decrease in employment for people with asthma can be attributed solely to people with severe asthma. However, as they make up approximately 9.5% of all people with asthma (Rönnebjerg et al.), it is reasonable to assume that there is some overlap between the unemployed group and severe asthma group (see Benefits section of this paper for more detail).

Interestingly, the differences in employment status between women with and without asthma, as well as men with and without asthma are not statistically significant. This is despite severe asthma being more prevalent in women (Poinasamy & Khan, 2022), though, as discussed above, while unemployment likely correlates with asthma severity, it cannot be treated as a proxy for asthma severity. For both H3 and H4 it was not possible to reject the null hypothesis, which suggests that neither men nor women with asthma are less likely to be employed than their counterparts without asthma, despite people with asthma overall being less likely to be employed than people without asthma.

	All genders		Women		Men	
	Odds ratio	S.E.	Odds ratio	S.E.	Odds ratio	S.E.
Asthma diagnosed by doctor	-0.166*	0.085	-0.169	0.116	-0.132	0.126
Controls?	Yes		Yes		Yes	
N	6330		3181		3149	

\*p<0.05, \*\* p<0.01, \*\*\* p<0.001

Table 3: Regression model of likelihood to be employed with and without gender split

## Benefits

As mentioned in the Methods section, HSE 2018 included information about 11 working age benefits and 5 disability benefits. When it comes to working age benefits, regression analysis shows that people with asthma are slightly but significantly more likely to claim a higher number of benefits ( $\beta = 0.182$ ,  $p<0.001$ ). When regression is split by gender, similarly to income, the coefficient for women is both statistically significant and represents a worse outcome than the general population ( $\beta = 0.254$ ,  $p<0.001$ ), whereas impact on men is not statistically significant. Therefore, it is possible to confirm H5 and state that women with asthma are on a higher number of working age benefits than women without asthma, but for H6, rejecting null hypothesis was not possible; men with and without asthma are likely to be on a similar number of working age benefits.

	All genders		Women		Men	
	Coeff.	S.E.	Coeff.	S.E.	Coeff.	S.E.
(Constant)	2.040***	0.077	2.154***	0.115	1.926***	0.100
Asthma diagnosed by doctor	0.182***	0.041	0.254***	0.060	0.089	0.055
Age group	-0.084***	0.007	-0.095***	0.010	-0.073	0.009***
Cohabiting	-0.118*	0.047	-0.107	0.070	-0.130	0.061*
Divorced	0.360***	0.080	0.656***	0.105	-0.209	0.125
Separated	0.691***	0.128	1.267***	0.172	-0.183	0.190
Single	0.000	0.046	0.220**	0.069	-0.175	0.060*
Widowed	0.298	0.180	0.218	0.212	0.705	0.371
Asian	0.286***	0.054	0.192*	0.084	0.389	0.068***
Black	0.237	0.086	0.140	0.117	0.213	0.125
Mixed / multiple ethnic backgrounds	0.362	0.108	0.091	0.148	0.676	0.157***
Other ethnic background	0.291**	0.144	0.248	0.203	0.263	0.201
Education below degree	-0.596***	0.050	-0.609***	0.074	-0.576	0.065***
Education: degree or equivalent	-1.078***	0.053	-1.131***	0.078	-1.023	0.070***
N	6033		3032		3001	
R-Squared	0.119		0.152		0.113	

\*p<0.05, \*\* p<0.01, \*\*\* p<0.001

Table 4: Regression model number of working age benefits with and without gender split

Analysis of disability benefits received by people with and without asthma shows that people with asthma, as well as men and women with asthma in isolation, are slightly more likely to receive a higher number of benefits. However, scatterplots for regression standardized predicted values for all three regressions are heteroskedastic, suggesting that p-values are likely to be incorrect. This might be caused by omitted variable bias; asthma is not considered to be a disability in all cases, so including a measure of asthma severity would likely improve the model. As discussed in Employment section, information on asthma severity is not available in HSE 2018. Given the very low value of the coefficients, generally low prevalence of severe asthma in the population, and the fact that being on receipt of disability benefits with asthma does not necessarily mean being in receipt of disability benefits because of asthma, I think it is justified to state that the impact of asthma on the likelihood of claiming disability benefits in working age individuals is low. This conclusion is corroborated by the analysis of employment status and working age benefits presented above – the majority of people with asthma aged 16-64 either are employed, or are expected to be employed.

Despite coefficients being statistically significant for both men and women, it was not possible to reject the null hypothesis for both H7 and H8 due to issues with diagnostic statistics; no significant

difference between women with and without asthma, or men with and without asthma was observed when it comes to receipt of disability benefits.

	All genders		Women		Men	
	Coeff.	S.E.	Coeff.	S.E.	Coeff.	S.E.
(Constant)	0.236***	0.032	0.256***	0.047	0.207***	0.044
Asthma diagnosed by doctor	0.093***	0.017	0.107***	0.025	0.077**	0.024
Age group	0.017***	0.003	0.018***	0.004	0.017***	0.004
Cohabiting	-0.030	0.020	-0.021	0.028	-0.039	0.027
Divorced	0.111**	0.033	0.156***	0.043	0.014	0.055
Separated	0.052	0.053	0.124	0.070	-0.066	0.083
Single	0.122***	0.019	0.093**	0.028	0.150***	0.026
Widowed	0.064	0.073	0.077	0.084	-0.012	0.155
Asian	-0.067**	0.022	-0.046	0.034	-0.087*	0.030
Black	-0.084*	0.035	-0.085	0.047	-0.078	0.054
Mixed / multiple ethnic backgrounds	0.082	0.045	0.006	0.060	0.202*	0.069
Other ethnic background	0.024	0.059	0.106	0.081	-0.085	0.086
Education below degree	-0.229***	0.021	-0.251***	0.030	-0.203***	0.028
Education: degree or equivalent	-0.314***	0.022	-0.342***	0.032	-0.283***	0.030
N	6043		3040		3003	
R-Squared	0.058		0.062		0.052	

\*p<0.05, \*\* p<0.01, \*\*\* p<0.001

Table 5: Regression model number of disability benefits with and without gender split

### Home ownership

Regression analysis shows that people with asthma are 19% less likely to own their home (either outright or with a mortgage). Analysis split by gender reveals that the outcome for women is worse in comparison; women with asthma are 27% less likely to own their home than women without asthma, whereas the odds ratio for men is not statistically significant. This means that H9 has to be accepted; women with asthma are less likely to own their homes than women without asthma. H10, on the other hand, was not confirmed, as the odds ratio between men with and without asthma is not statistically significant.

It is worth noting that establishing a causal relationship between asthma and home ownership is particularly challenging compared to other variables considered in this study. Of course, not all owner-occupiers are wealthy, and not all renters are poor, so while it is justified to a degree to treat home ownership as a proxy for wealth (if only because a home is a significant financial asset),



individuals' circumstances can be complex. With that caveat in mind, the vicious circle of poverty and ill health, in which financial deprivation fuels poor health outcomes, which in turn have a financial impact, is well-researched (Bartley, 2016). There have even been efforts to study poverty-related environmental causes of asthma specifically (Singh et al., 2020), though I am not aware of any such research relating to England.

The fact that women with asthma are less likely than other women to own their homes could be well-explained by other findings of this study; as they are likely to earn less and to be in receipt of a higher number of benefits, it stands to reason that women with asthma would struggle more than other women to save for a downpayment and get on the property ladder. However, literature suggests that the explanation might also go in the other direction: women from less affluent backgrounds, who are less likely to receive help from their families to enter the housing market, are also more likely to present with asthma symptoms.

	All genders		Women		Men	
	Odds ratio	S.E.	Odds ratio	S.E.	Odds ratio	S.E.
Asthma diagnosed by doctor	-0.191**	0.073	-0.269**	0.103	-0.095	0.105
Controls?	Yes		Yes		Yes	
N	6208		3120		3088	

\*p<0.05, \*\* p<0.01, \*\*\* p<0.001

Table 6: Regression model of likelihood to own a home with and without gender split

## Discussion

The findings presented above, when analyzed together, paint a nuanced and interesting picture of the financial situation of people with asthma. In this section, I would like to focus on two aspects in particular: the drop in income experienced by women with asthma, which cannot be explained by unemployment, and the fact that the financial burden of asthma is felt by women much more than by men.

When it comes to exploring the experience of women with asthma, it is important to emphasize that in this study, the first step was to compare them to other women, as opposed to comparing them to men with asthma. It is, of course, known and widely described that women on average earn less than men, are more likely to work fewer hours per week, and are disproportionately expected to take on caring responsibilities for children and for family members suffering from ill health (Peetz, 2017). However, there is no reason to suspect that women with asthma would be particularly affected by those mechanisms compared to other women, and yet the impact on their earnings is significant even after controlling for education level, marital status and ethnic origin. Conversely, men do not experience anything of this sort.

One of the reasons behind this discrepancy between genders might be higher prevalence of severe asthma in women, which could not be effectively controlled for within HSE 2018. However, this likely has limited impact. First of all, while severe asthma is more prevalent in women, the discrepancy between genders is not so large that it would fully explain the observed one-sided impact on earnings. Secondly, if severe asthma was a deciding factor, I would expect there to be an impact on employment as well as earnings. There is no reason for women with severe asthma to be more likely to work in lower paid jobs than women with less severe asthma; rather, they would be more likely to be considered unable to work due to a serious health condition, and rely on disability benefits. When

viewed in conjunction, the earnings and employment status of women with asthma do not support the explanation that lower earnings in women with asthma compared to other women can be meaningfully attributed to severe asthma, though I acknowledge that it might still have a small impact.

It is also interesting to point out that these results go against what one could expect when considering jobs more stereotypically associated with women, such as childcare, cleaning or service jobs. Those jobs are often characterized by high exposure to asthma triggers, such as various chemicals (in cleaning and service) or respiratory viruses and bacteria due to having a lot of face-to-face contact with many people (in service and childcare). Taking this into account, I would expect that women with asthma could struggle with attendance in jobs that have a high potential for triggering their condition, but that they could have similar outcomes to women without asthma if they were able to work white collar jobs, which would often (though not always) be better paid. If that was the case, the findings would show that women with asthma are less likely to be employed, but the impact on earnings is minimal. This is because unemployment would disproportionately affect women who would otherwise work lower-paid jobs, and the gap between people in receipt of benefits and low earners is smaller than the gap between people in receipt of benefits and high earners. However, the opposite is true: women with asthma earn less while being equally likely to be employed as women without asthma. This would suggest that there is a mechanism that affects women with asthma across a broad array of professions, causing specifically lower earnings, but not long-term unemployment.

It is of course true that people with disabilities face discrimination in employment (Brown & Moloney, 2018), so it would be reasonable to attribute this discrepancy in earnings simply to bias, even though people with asthma are usually not considered disabled in the legal sense. However, as asthma can often be an invisible condition (unless asthma is voluntarily disclosed, or coworkers witness an asthma attack, the employer usually has no way of knowing), direct discrimination is less likely, though of course this is not possible to quantify based on existing data. Even if bias plays a part, it is useful to define what form the disadvantage takes specifically when it comes to women with asthma. The pattern of similar level of employment, lower earnings and higher number of working age benefits compared to women without asthma observed in HSE 2018 data is consistent with the phenomenon of precarious employment, defined by Vosko et al. as “employment that lacks standard forms of labour security” (2009, p. 2). Precarious employment is a dynamic concept that escapes precise definitions because it describes a very dynamic economic reality, but since in this case, it is being used to describe a specific set of data captured at a defined point in time, I am going to focus this discussion on two types of precarity that best fit the pattern visible in HSE 2018: underemployment and intermittent employment.

Underemployment is a well-researched phenomenon, and it is more likely to happen to people who face some form of social disadvantage, including disability (Brown & Moloney, 2018). It is usually defined as being in a limbo between employment and unemployment. People who are underemployed are unable to find work that pays enough to fulfil their needs (either because they lack necessary qualifications and/or experience to compete in the job market, or because they have health challenges and/or caring responsibilities that prevent them from devoting the required number of hours to work each week), but are still able to secure some income through part-time work, participation in the gig economy, or the mixture of both. Underemployed people are usually counted as employed in government reporting, but since they work fewer hours, they might earn less than people employed full time, and qualify for certain means-tested benefits. It is possible that women with asthma are affected by this, especially because, as HSE 2018 shows, they are less likely

to own the homes in which they live, which can (though with some caveats, as discussed in the Findings section) be cautiously considered as an indicator that they are more likely to be working class and not in possession of generational wealth. I would expect gig work to be particularly appealing to women with asthma, given the flexibility it ostensibly promises – they could work more when they are feeling better, but take a break when their asthma gets worse. Of course, this comes with the significant downside of unpredictable income (there might not be more hours available on the days when they feel better) and low pay, but that might still be preferable (or easier to obtain) than work in which they might face disciplinary action if they miss too many days.

Intermittent employment is characterized by periods of full-time or nearly full-time employment interrupted by short spells of unemployment. This is also consistent with findings from HSE 2018; it would suggest people are still employed for most of the year, but they use benefits (like Jobseeker's Allowance or Universal Credit) as a temporary bridge to help them in the periods between spells of employment. In general, job-hopping is often done to achieve higher, not lower earnings (Groysberg et al., 2021), but this is clearly not the case here. If women with asthma change jobs more often, their lower earnings and spike in benefit claims suggest that they are not leaving to lined-up, better paid jobs, but leaving in some form of distress, for example because they are being dismissed or to avoid a formal disciplinary process that could result in dismissal.

While it is useful to define the difference between underemployment and intermittent employment to show that different types of benefits claimed are consistent with different scenarios, it is worth noting that in the real world, those two routes might mix, or apply to the same people at different points of their lives. For example, a person might lose a full-time job, and participate in the gig economy for a short period until finding more stable employment.

Based purely on logic, there is also a third route that matches the low pay – high employment – high benefits pattern; namely, motherhood. It is possible, based on data alone, that women with asthma are more likely to work part-time (thus earning less overall, even if their hourly wage or FTE salary is at the same level as other women's) to take care of children. As parents, they would also collect child benefit. However, I have found no indication in literature that would suggest women with asthma are more likely to be mothers, or more likely to take on part-time work because of children. On the contrary, women with asthma face additional health challenges in pregnancy and childbirth (Turkeltaub et al., 2019), which on its own would not be sufficient to argue that they are less likely to be mothers, but in absence of other evidence, it definitely supports not arguing that they are more likely to be mothers. I have therefore decided to discard this explanation as not consistent with what is currently known about asthma.

All the mechanisms described above are consistent with both findings from HSE 2018 and the way asthma often presents, but they do not explain why the combination of lower income, equal employment and higher number of benefits applies to women only. I do not think it is sufficient to attribute this simply to women in general facing more disadvantage in the workplace, or even to higher prevalence of asthma in women. Scholars who research intersectionality consistently show that living on multiple axes of disadvantage creates a unique situation which is more than the sum of its parts (Hill Collins & Bilge, 2016), which would suggest that considering the impact of gender and the impact of ill health separately will not paint the full picture. A common denominator found in literature relating to women as well as literature relating to disability seems to be absence and need for flexibility, with the latter connected particularly strongly to precarity (O'Reilly et al., 2009); this could be to take care of dependents, take on a wide array of other home and family obligations, manage symptoms or attend medical appointments. It stands to reason that for women managing a chronic health condition, this challenge is enhanced, making their schedules unpredictable. This does

not fit well with a traditional workplace, designed (as social model of disability suggests) for an able-bodied worker who has no additional responsibilities interfering with their core work hours.

## Conclusion

### Employment vs career – policy implications

As shown in the Discussion section of this paper, data shows that women with asthma face a set of unique workplace challenges that remain largely invisible in traditionally collected employment data, because they are not disproportionately unemployed. The problem is not finding work – it is building a long-term, sustainable career in which they can reach their full potential. Instead, women with asthma experience a higher level of precarious employment, both in the strict (i.e. related to high participation in gig economy) and colloquial (frequent and short periods of unemployment between traditional jobs) sense of the word. Precarity is a well-recognized problem in the current workforce, and there are many solutions proposed for addressing it on the macro scale, including improved access to protections and benefits for gig workers (Venkat, 2023). I am not attempting to argue against these solutions; there is nothing in HSE 2018 to suggest that they would not benefit people with asthma in some way, even if they are not tailored to benefit them specifically. That said, I would like to suggest additional solutions that could address specific issues faced by women with asthma, and create a more accessible workplace: flexible working and improvements in sick pay provision.

### Flexible working as an accessibility tool

In-depth analysis of flexible working provisions in the UK is not in scope of this dissertation, but I would like to briefly discuss how it could be beneficial to women with asthma, mainly because it is generally lauded by disability advocates as a good solution for people with disabilities overall (Shu, 2023). Flexible working covers a broad array of practices in which workers decide, with varying degrees of freedom, where and when they work. This could include working from home, compressed hours, not requiring set start or finish times, or other similar arrangements. It is worth noting that, following lockdowns in 2020 and 2021, various flexible arrangements have become more popular at least in some sectors (Aleem et al., 2023), which is why detailed discussion is not in scope of this study; there is no need to recommend a solution that is already being implemented, and dedicated research specifically into how well flexible working performs as an accessibility tool is both needed and possible, given this recent change.

From the perspective of managing asthma symptoms, the obvious benefit of flexible working to people with asthma would be the ability to better manage exposure to triggers. A simple example would be working from a well-controlled home environment during summer months, when increased levels of both pollen and air pollution make exacerbations more likely. Flexible hours could help with managing medical appointments, as well as handling challenges related to changes in symptoms. For example, people who experience breathlessness during the night could work shorter days or start later following worse nights, and work longer days or start earlier when they have been able to get enough sleep.

However, an obvious drawback of working flexibly is its limited application; many jobs, such as care, hospitality, construction, genuinely require workers to be present in a specific physical location on most days, and are less able to accommodate short-notice changes to work hours. It is also better suited to benefit people with some specific symptoms or triggers (for example those who are sensitive to pollen or those who experience breathlessness at night), rather than people with asthma as a whole. The latter is not necessarily a drawback, as those symptoms are among the more

common and tailored support can be very effective, but it shows that flexible working should be seen as one of many tools to improve workplace accessibility, rather than the sole solution.

#### Statutory sick pay and sickness management in the workplace

In contrast to flexible working, improvements to statutory sick pay and sickness management in the workplace have the potential to improve the outcomes for all people with asthma who are employed in some way, as opposed to those with a select set of symptoms. At the very least, even people with very well-controlled asthma who never experience symptoms need to attend medical appointments from time to time (annual check-up, vaccinations). They are also more at risk from common seasonal respiratory infections.

It is not possible to conclude, based on HSE 2018 alone, that issues with sickness absence are the driver behind lower earnings achieved by women with asthma. However, since there is a significant difference between them and their healthy counterparts, even after controlling for known factors associated with lower earnings, such as ethnic origin, marital status and education level, the cause is likely to be related to the health condition itself. Asthma is a condition that does not impact day-to-day performance, and it is usually not difficult to hide, which makes direct discrimination less likely. The one potentially problematic work behavior that asthma symptoms are consistent with is a higher level of sickness absence, both because of short spells of sickness needed to recover from more challenging attacks (up to and including hospital stays), and because bouts of colds and flu last longer and are more difficult to overcome without taking time off. Issues with sickness absence would also be consistent with intermittent employment that patterns observed in HSE 2018 point to.

The UK has one of the least generous sick pay and sick leave policies among industrialized nations (Treble et al., 2011). In 2018, most workers were entitled to statutory sick pay of £92.05 a week, which represented 33.6% of what a full-time worker aged over 25 working for a minimum wage would have earned in the same period (HM Revenue & Customs). For comparison, the German equivalent of statutory sick pay is 80% of the worker's base salary (Pichler and Ziebarth, 2017), and France offers a less generous 50-66% depending on circumstances (Pollak, 2015). While many organizations offer to pay their employees above the statutory minimum, to my knowledge there has not been a systematic attempt to quantify what percentage of the workforce gets this benefit. Some anecdotal evidence suggests that it is fairly widespread (Treble et al., 2011), but a recent campaign launched by a coalition of healthcare charities has demanded an uplift to statutory sick pay, citing it as one of the sources of workers' distress (Quinn, 2023), which would suggest that there is a lot of variation between sectors. People participating in the gig economy may be entitled to sick pay if they are classed as workers (GOV.UK, 2012), but it depends on the specific conditions of their work. In addition, the dominant sickness management philosophy in UK workplaces is still firmly rooted in the idea of treating it as a performance problem, with managers encouraged to only consider it in terms of financial costs (Treble et al., 2011). This has led to the rise of presenteeism, which is defined as employees coming to work while sick, either out of sense of obligation or fear of consequences.

The approach in which workers are treated with suspicion and paid very little when they are ill has two drawbacks for people with asthma. The most obvious one is that, since they need to attend medical appointments, and they might be unwell more often or for longer periods than their healthy counterparts, they take a bigger financial hit from having to rely on statutory sick pay more. Since their absences are likely to take more days each year in comparison to their co-workers (regardless if the absences are due to more frequent or longer spells), they could also be more likely to be subject to performance management aimed to improve their attendance. Based on available data, it is not possible to determine authoritatively why women with asthma are affected by this more heavily than

men with asthma, but one possible explanation could be caring responsibilities. If a person is having unplanned absences due to sickness, as well as due to emergencies arising from giving care to others, they would be seen as less reliable, even if they are using their annual leave to cover at least some of the absences. Further research could shed some light on whether this is indeed what happens, as well as on other mechanisms affecting how women with asthma function in the workplace.

In addition, people with asthma are also likely to be adversely affected by contagious presenteeism. The term was coined by Pichler and Ziebarth (2017), and it refers to people attending work while unwell with contagious respiratory illnesses, such as colds and flu. Their research on this issue shows that curbing contagious presenteeism has an impact on the population as a whole, with number of infections dropping in American cities even after a very limited sick pay provisions incentivized some workers to not come to work while ill. This finding shows that people with asthma stand to benefit indirectly from their coworkers having access to more generous sick pay and sick leave, as it would mean less exposure to respiratory infections, and therefore improvements in both health outcomes and attendance.

As shown above, more generous statutory sick pay in line with what is offered by other European countries would be a necessary first step to improve the situation of people with asthma, both to help them manage their medical needs, and to help incentivize their coworkers to curb the spread of respiratory infections in workplaces. Improvements to statutory sick pay could then be used to start a cultural shift away from treating sickness as a performance problem; if statutory sick pay is sufficiently high, and offering a more generous company sick pay as an additional benefit becomes less of a financial burden, employers might be more open to a disability-friendly approach to sickness absence.

#### Future research

The aim of this study was to provide an initial exploration of the financial situation of people with asthma, and the intersection of gender and ill health. This has uncovered a few areas that could be explored in future research, especially around women with asthma. I have also posed that my recommendations could be applied to people suffering from a broader array of chronic health conditions, as the findings may not be connected to asthma symptoms, which suggests that similar research into other conditions would be beneficial.

When it comes to the financial situation of women with asthma, given their decreased income, it would be particularly useful to explore whether their condition requires them to spend additional money. This would provide a more comprehensive picture of their financial situation, and give a realistic estimate of the cost of their condition, both in lost earnings and additional expenditure. A qualitative study would be particularly welcome, as it would move beyond simply gathering data on spending related to medicines and medical devices, and provide a more in-depth exploration of costs that might not seem obvious at a glance (such as, for example, air purifiers, special household chemicals or personal care products, or other payments made to avoid contact with triggers). It could also show savings (if any) women with asthma make as a result of managing their condition.

Another area for future research is a deep dive into women with asthma's experience of sick leave, underemployment and intermittent employment. While my analysis suggests that improvements to sick pay and changes to how sickness is managed in a workplace could be the answer to issues experienced by women with asthma, my conclusions were necessarily broad, as they were drawn from data that was not specifically collected with the aim of learning how women with asthma

navigate sickness-related performance management. Here, again, a qualitative study could enrich the findings and provide useful detail on specific problems.

Finally, I would welcome my findings to be challenged both in the context of post-Covid world, and the context of other chronic health conditions. In both cases, I would expect findings to be broadly similar to what appeared in HSE 2018, because none of the impact observed could be traced back specifically to asthma symptoms. Covid-19 was also not found to have affected people with asthma more heavily than the general population (Laorden et al.), which leads me to expect that more current data would not be materially different from 2018 data. It is also worth noting that public health measures introduced during the pandemic, which might have been helpful to people with asthma for reasons not related to the pandemic (such as mask mandates), have largely been rolled back, which means that they would not have reaped long-term benefits.

### [The cost of breathing](#)

The analysis presented above shows clearly that the cost of asthma in women is significant; both to the women themselves, in the form of lost earnings, and to the state through benefits. I have proposed that increasing statutory sick pay, as well as promoting a shift in management culture relating to sickness management, could be powerful tools in limiting these costs, as well as resulting in better health outcomes. Last but not least, given that one of the purposes of social research is to propose solutions in hopes that they can improve society in some ways: it is simply unjust that for women with asthma, there is a tangible cost attached simply to breathing.

## Works cited

- Aleem, M., Sufyan, M., Ameer, I., & Mustak, M. (2023). Remote work and the COVID-19 pandemic: An artificial intelligence-based topic modeling and a future agenda. *Journal of Business Research*, 154, 113303. <https://doi.org/10.1016/j.jbusres.2022.113303>
- Ansell, B., & Cansunar, A. (2021). The political consequences of housing (un)affordability. *Journal of European Social Policy*, 31(5), 597–613. <https://doi.org/10.1177/09589287211056171>
- Barnes, C. (2019). Understanding the social model of disability: past, present and future. In N. Watson, A. Roulstone, & C. Thomas (Eds.), *Routledge Handbook of Disability Studies*. Taylor & Francis Group.
- Bartley, M. (2016). *Health inequality : an introduction to concepts, theories and methods* (2nd ed.). Polity.
- Brown, R. L., & Moloney, M. E. (2018). Intersectionality, Work, and Well-Being: The Effects of Gender and Disability. *Gender & Society*, 33(1), 94–122. <https://doi.org/10.1177/0891243218800636>
- Bryman, A. (2012). *Social Research Methods* (4th ed.). Oxford University Press.
- Chaiprom, P., Sekararithi, R., Tongsong, T., & Traisrisilp, K. (2021). Pregnancy Outcomes among Women with Intermittent Asthma: A Retrospective Cohort Study. *International Journal of Environmental Research and Public Health*, 18(12), 6376. <https://doi.org/10.3390/ijerph18126376>
- Cox, L. A. (Tony). (2017). Socioeconomic and air pollution correlates of adult asthma, heart attack, and stroke risks in the United States, 2010–2013. *Environmental Research*, 155, 92–107. <https://doi.org/10.1016/j.envres.2017.01.003>
- COVID-19 Precautions Reduce Flu Cases. (2020). *Hospital Employee Health*, 39(11). <https://www.proquest.com/docview/2506719198?accountid=8629>
- GOV.UK. (2012, January 26). *Employment status*. GOV.UK. <https://www.gov.uk/employment-status/worker>



Gov.UK. (2018). *Benefits* - GOV.UK. Wwww.gov.uk.

<http://web.archive.org/web/20171226211026/https://www.gov.uk/browse/benefits>

Groysberg, B., Healy, P., & Lin, E. (2021). Job-Hopping Toward Equity. *MIT Sloan Management Review*, 62(4), 1–7.

<https://www.proquest.com/docview/2562944665/abstract/A169729DFF7494CPQ/1?accountid=8629>

Hill Collins, P., & Bilge, S. (2016). *Intersectionality*. Polity Press.

HM Revenue & Customs. “Rates and Thresholds for Employers: 2018 to 2019.” *GOV.UK*, 4 Jan. 2018, [www.gov.uk/guidance/rates-and-thresholds-for-employers-2018-to-2019](http://www.gov.uk/guidance/rates-and-thresholds-for-employers-2018-to-2019).

Jessop, H., Li, D., Katz, A. R., & Hurwitz, E. L. (2017). Asthma prevalence disparities and differences in sociodemographic associations with asthma, between Native Hawaiian/Other Pacific Islander, Asian, and White adults in Hawaii – Behavioral Risk Factor Surveillance System (BRFSS), 2001–2010. *Ethnicity & Health*, 24(1), 1–23.

<https://doi.org/10.1080/13557858.2017.1297775>

Laorden, Daniel, et al. “Long COVID Outcomes in an Asthmatic Cohort and Its Implications for Asthma Control.” *Respiratory Medicine*, vol. 207, 1 Feb. 2023,

[www.resmedjournal.com/article/S0954-6111\(22\)00357-2/fulltext](http://www.resmedjournal.com/article/S0954-6111(22)00357-2/fulltext),

<https://doi.org/10.1016/j.rmed.2022.107092>. Accessed 5 Apr. 2023.

Lipinska-Ojrzanowska, A. A., Wiszniewska, M., & Walusiak-Skorupa, J. M. (2016). Work-related asthma among professional cleaning women. *Archives of Environmental & Occupational Health*, 72(1), 53–60. <https://doi.org/10.1080/19338244.2016.1156046>

NatCen Social Research, University College London, Department of Epidemiology and Public Health. (2022). *Health Survey for England, 2018*. [data collection]. 2nd Edition. UK Data Service. SN: 8649, DOI: <http://doi.org/10.5255/UKDA-SN-8649-2>

NHS. (2021, April 19). *Asthma*. NHS. <https://www.nhs.uk/conditions/asthma/>

NHS Business Services Authority. (n.d.). *Medical Exemption Certificates* | NHSBSA.

[Www.nhs.uk](https://www.nhs.uk). Retrieved July 17, 2023, from <https://www.nhs.uk/check-if-you-have-nhs-exemption/medical-exemption-certificates>

NHS England. (2019). *NHS England Respiratory Disease*. England.nhs.uk; NHS England.

<https://www.england.nhs.uk/ourwork/clinical-policy/respiratory-disease/>

O'Reilly, J., MacInnes, J., Nazio, T., & Roche, J. M. (2009). The United Kingdom. From flexible employment to vulnerable workers. In *Gender and the Contours of Precarious Employment* (pp. 108–125). Taylor & Francis Group.

Office for National Statistics. (2022, December 21). *Population estimates for the UK, England, Wales, Scotland and Northern Ireland - Office for National Statistics*. Wwww.ons.gov.uk.

<https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates/bulletins/annualmidyearpopulationestimates/mid2021>

Office for National Statistics. "Gender Identity, England and Wales - Office for National Statistics."

Wwww.ons.gov.uk, 6 Jan. 2023,

[www.ons.gov.uk/peoplepopulationandcommunity/culturalidentity/genderidentity/bulletins/genderidentityenglandandwales/census2021](https://www.ons.gov.uk/peoplepopulationandcommunity/culturalidentity/genderidentity/bulletins/genderidentityenglandandwales/census2021).

Peetz, D. (2017). Regulation Distance, Labor Segmentation, and Gender Gaps. In *Women, Labor Segmentation and Regulation: Varieties of Gender Gaps* (pp. 3–22). Palgrave Macmillan.

Pichler, S., & Ziebarth, N. R. (2017). The pros and cons of sick pay schemes: Testing for contagious presenteeism and noncontagious absenteeism behavior. *Journal of Public Economics*, 156, 14–33. <https://doi.org/10.1016/j.jpubeco.2017.07.003>

Poinasamy, K., & Khan, Y. (2022). Asthma is worse for women. In S. Walker (Ed.), *Asthma and Lung UK*. <https://www.asthma.org.uk/049661ee/globalassets/research/asthma-is-worse-for-women-report-1.pdf>

Pollak, C. (2015). The impact of a sick pay waiting period on sick leave patterns. *The European Journal of Health Economics*, 18(1), 13–31. <https://doi.org/10.1007/s10198-015-0755-0>

Quinn, B. (2023, August 15). Charities and experts call for overhaul of UK's "broken" sick pay system.

*The Guardian*. [https://www.theguardian.com/society/2023/aug/15/charities-experts-call-overhaul-broken-uk-sick-pay-system?CMP=share\\_btn\\_link](https://www.theguardian.com/society/2023/aug/15/charities-experts-call-overhaul-broken-uk-sick-pay-system?CMP=share_btn_link)

Rönnebjerg, Lina, et al. "Severe Asthma in a General Population Study: Prevalence and Clinical Characteristics." *Journal of Asthma and Allergy*, vol. Volume 14, Sept. 2021, pp. 1105–1115, <https://doi.org/10.2147/jaa.s327659>. Accessed 10 Oct. 2022.

Shakespeare, T. (2013). The Social Model of Disability. In L. Davis (Ed.), *The Disability Studies Reader* (pp. 214–221). Taylor & Francis Group.

Shu, D. M. (2023). Remote Work Disability Accommodations in the Post-Pandemic Workplace: The Need for Evidence-Driven Analysis. *Temple Law Review*, 95(2), 201–256. <https://heinonline.org/HOL/P?h=hein.journals/temple95&i=217>

Singh, S. K., Gupta, J., Sharma, H., Pedgaonkar, S. P., & Gupta, N. (2020). Socio-economic Correlates and Spatial Heterogeneity in the Prevalence of Asthma among Young Women in India. *BMC Pulmonary Medicine*, 20(1). <https://doi.org/10.1186/s12890-020-1124-z>

"Spacers | Asthma + Lung UK." *Www.asthma.org.uk*, [www.asthma.org.uk/symptoms-tests-treatments/treatments/spacers](http://www.asthma.org.uk/symptoms-tests-treatments/treatments/spacers).

Temam, S., Chanoine, S., Bédard, A., Dumas, O., Sanchez, M., Boutron-Ruault, M.-C., Siroux, V., Rican, S., Varraso, R., & Le Moual, N. (2019). Low socioeconomic position and neighborhood deprivation are associated with uncontrolled asthma in elderly. *Respiratory Medicine*, 158, 70–77. <https://doi.org/10.1016/j.rmed.2019.09.010>

Treble, J., Barmby, T., & Cambridge University Press. (2011). *Worker absenteeism and sick pay*. Cambridge University Press.

Timmermans, S., & Freidin, B. (2007). Caretaking as articulation work: The effects of taking up responsibility for a child with asthma on labor force participation. *Social Science & Medicine*, 65(7), 1351–1363. <https://doi.org/10.1016/j.socscimed.2007.05.027>

Turkeltaub, P. C., Lockett, R. F., Holmes, K., & Friedmann, E. (2019). Asthma and/or hay fever as predictors of fertility/impaired fecundity in U.S. women: National Survey of Family Growth.

*Scientific Reports*, 9(1). <https://doi.org/10.1038/s41598-019-55259-8>

Venkat, V. (2023). Delivering fairness: the need for an antitrust standard that considers labor market consolidation in the gig economy. *Arizona Law Review*, 65(1), 257–284. [Link](#).

Vosko, L. F., MacDonald, M., & Campbell, I. (2009). Gender and the concept of precarious employment. In *Gender and the Contours of Precarious Employment* (pp. 1–25). Taylor & Francis Group.

*What is asthma?* (n.d.). Asthma UK. <https://www.asthma.org.uk/advice/understanding-asthma/what-is-asthma>

## Appendix

Financial situation of people with asthma: all genders

	Income		Employment		Working age benefits		Disability benefits		Home ownership		Housing payments	
	Coef.	S.E.	Odds ratio	S.E.	Coef.	S.E.	Coef.	S.E.	Odds ratio	S.E.	Odds ratio	S.E.
(Constant)	12.965***	0.399			2.040***	0.077	0.236***	0.032				
Asthma diagnosed by doctor	-0.696**	0.207	-0.166*	0.085	0.182***	0.041	0.093***	0.017	-0.191**	0.073	-0.140	0.093
Age	-0.240***	0.035	-0.162***	0.014	-0.084***	0.007	0.017***	0.003	0.144***	0.013	0.388***	0.016
Cohabitating	-1.276***	0.233	-0.059	0.118	-0.118*	0.047	-0.030	0.020	-0.926***	0.083	-0.458***	0.117
Divorced	-5.231***	0.412	-0.888***	0.142	0.360***	0.080	0.111**	0.033	-1.353***	0.138	-0.440**	0.157
Separated	-5.806***	0.632	-1.180***	0.221	0.691***	0.128	0.052	0.053	-1.816***	0.225	-1.112**	0.340
Single	-4.776***	0.235	-1.643***	0.094	0.000	0.046	0.122***	0.019	-0.805***	0.081	0.813***	0.098
Widowed	-6.491***	0.926	-1.684***	0.293	0.298	0.180	0.064	0.073	-1.216***	0.305	0.557	0.297
Asian	-3.947***	0.284	-0.515***	0.105	0.286***	0.054	-0.067**	0.022	-0.353***	0.095	0.139	0.115
Black	-3.281***	0.438	-0.473**	0.150	0.237	0.086	-0.084*	0.035	-1.737***	0.160	-1.084***	0.233
Mixed / multiple ethnic backgrounds	-0.477	0.551	-0.181	0.207	0.362	0.108	0.082	0.045	-0.543**	0.182	-1.514***	0.414
Other ethnic background	-3.368***	0.788	-0.707**	0.266	0.291**	0.144	0.024	0.059	-0.930***	0.255	-1.131*	0.444
Education below degree	2.785***	0.262	0.809***	0.090	-0.596***	0.050	-0.229***	0.021	1.230***	0.089	0.609***	0.116
Education: degree or equivalent	6.013***	0.276	1.052***	0.101	-1.078***	0.053	-0.314***	0.022	1.489***	0.095	0.634***	0.123
N	5196		6330		6033		6043		6330		6330	
R-Squared	0.242				0.119		0.058					

\*p<0.05, \*\* p<0.01, \*\*\* p<0.001

Financial situation of people with asthma: women only

	Income		Employment		Working age benefits		Disability benefits		Home ownership		Housing payments	
	Coeff.	S.E.	Odds ratio	S.E.	Coeff.	S.E.	Coeff.	S.E.	Coeff.	S.E.	Odds ratio	S.E.
(Constant)	12.942***	0.565			2.154***	0.115	0.256***	0.047				
Asthma diagnosed by doctor	-0.993***	0.284	-0.169	0.116	0.254***	0.060	0.107***	0.025	-0.269**	0.103	-0.198	0.132
Age group	-0.239***	0.050	-0.135***	0.020	-0.095***	0.010	0.018***	0.004	0.171***	0.018	0.407***	0.024
Cohabiting	-1.424***	0.329	0.102	0.166	-0.107	0.070	-0.021	0.028	-0.915***	0.119	-0.421*	0.168
Divorced	-5.482***	0.507	-0.877***	0.174	0.656***	0.105	0.156***	0.043	-1.574***	0.175	-0.635**	0.201
Separated	-6.949***	0.811	-1.053***	0.283	1.267***	0.172	0.124	0.070	-1.724***	0.291	-1.254**	0.454
Single	-4.738***	0.333	-1.375***	0.131	0.220**	0.069	0.093**	0.028	-0.912***	0.116	0.551***	0.146
Widowed	-6.654***	1.034	-1.563***	0.333	0.218	0.212	0.077	0.084	-1.102**	0.345	0.649	0.337
Asian	-3.609***	0.422	-0.317*	0.159	0.192*	0.084	-0.046	0.034	-0.192	0.143	0.395*	0.166
Black	-3.214***	0.573	-0.515**	0.189	0.140	0.117	-0.085	0.047	-1.621***	0.213	-0.865**	0.293
Mixed / multiple ethnic backgrounds	-0.090	0.741	0.231	0.291	0.091	0.148	0.006	0.060	-0.712**	0.245	-1.831**	0.629
Other ethnic background	-2.911**	1.064	-0.858*	0.354	0.248	0.203	0.106	0.081	-0.785*	0.372	-0.558	0.520
Education below degree	2.480***	0.374	0.770***	0.125	-0.609***	0.074	-0.251***	0.030	1.271***	0.131	0.649***	0.166
Education: degree or equivalent	5.961***	0.390	1.226***	0.143	-1.131***	0.078	-0.342***	0.032	1.649***	0.139	0.689***	0.175
N	2582		3181		3032		3040		3120		3120	
R-Squared	0.267				0.152		0.062					

\*p<0.05, \*\* p<0.01, \*\*\* p<0.001

Financial situation of people with asthma: men only

	Income		Employment		Working age benefits		Disability benefits		Home ownership		Housing payments	
	Coeff.	S.E.	Odds ratio	S.E.	Coeff.	S.E.	Coeff.	S.E.	Odds ratio	S.E.	Odds ratio	S.E.
(Constant)	13.054***	0.565			1.926***	0.100	0.207***	0.044				
Asthma diagnosed by doctor	-0.354	0.304	-0.132	0.126	0.089	0.055	0.077**	0.024	-0.095	0.105	-0.068	0.132
Age group	-0.249***	0.051	-0.191***	0.021	-0.073	0.009***	0.017***	0.004	0.123***	0.018	0.378***	0.023
Cohabiting	-1.178***	0.331	-0.243	0.168	-0.130	0.061*	-0.039	0.027	-0.936***	0.116	-0.462**	0.165
Divorced	-4.528***	0.703	-0.709**	0.255	-0.209	0.125	0.014	0.055	-0.958***	0.235	-0.188	0.254
Separated	-4.217***	0.999	-1.284***	0.357	-0.183	0.190	-0.066	0.083	-1.998***	0.361	-0.985	0.516
Single	-4.863***	0.334	-1.951***	0.137	-0.175	0.060*	0.150***	0.026	-0.718***	0.114	1.046***	0.135
Widowed	-5.563**	2.006	-1.944**	0.634	0.705	0.371	-0.012	0.155	-2.120**	0.769	-0.296	0.738
Asian	-4.277***	0.386	-0.692***	0.143	0.389	0.068***	-0.087*	0.030	-0.490***	0.127	-0.065	0.160
Black	-3.217***	0.678	-0.386	0.251	0.213	0.125	-0.078	0.054	-1.822***	0.246	-1.282**	0.390
Mixed / multiple ethnic backgrounds	-0.985	0.821	-0.727*	0.302	0.676	0.157***	0.202*	0.069	-0.255	0.281	-1.109*	0.555
Other ethnic background	-3.875**	1.167	-0.473	0.427	0.263	0.201	-0.085	0.086	-1.067**	0.355	-2.081*	0.926
Education below degree	3.066***	0.369	0.867***	0.132	-0.576	0.065***	-0.203***	0.028	1.212***	0.122	0.591***	0.164
Education: degree or equivalent	6.081***	0.391	0.891***	0.146	-1.023	0.070***	-0.283***	0.030	1.355***	0.131	0.590**	0.173
N	2615		3149		3001		3003		3088		3088	
R-squared	0.223				0.113		0.052					

\*p<0.05, \*\* p<0.01, \*\*\* p<0.001