

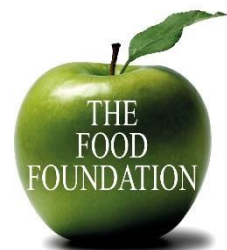
# **Vulnerability to food insecurity since the COVID-19 lockdown**

*Preliminary report*

*14 April 2020*

*Rachel Loopstra*

*King's College London*



## What's driving the hunger crisis since the UK COVID-19 lockdown?

On the 11<sup>th</sup> April 2020, the Food Foundation reported the results of their commissioned YouGov survey which found that more than three million people reported going hungry in the first three weeks of the UK's COVID-19 lockdown.<sup>1</sup> This report explores what is driving hunger in the population at this time, asking, has the COVID-19 lockdown exacerbated food insecurity among those who regularly struggle to afford enough food, created new economic vulnerability on account of loss of work and income and the loss of free school meals for children, or created new vulnerability because people are self-isolating and unable to get the food they need?

### Key findings

- The number of adults who are food insecure in the Britain is estimated to have quadrupled under the COVID-19 lockdown.
- A lack of food in shops alone explained about 40% of food insecurity experiences since the COVID-19 lockdown, but not all households were equally affected: adults with disabilities and adults with children were particularly vulnerable.
- Consistent with national monitoring data on food insecurity, groups at risk of poverty are at risk of food insecurity at this time. These include adults who are unemployed, adults with disabilities, adults with children, and Black and Ethnic Minority groups. But, self-isolation and a lack of food in shops has layered on additional risk of food insecurity for these groups.
- Income losses arising from the COVID-19 crisis have had an immediate impact on food insecurity. All adults reporting income losses of greater than 25% are at significantly heightened risk of food insecurity, including adults with background socio-economic risk of food insecurity as well as those typically found not at risk.
- Adults with children eligible for free school meals are at heightened risk of food insecurity arising from a lack of money.
- After accounting for background socio-economic factors, all adults who reported self-isolating, whether for 7-14 days or 12 weeks, are at heightened risk of going without food because they cannot go out and do not have other means of acquiring it. Adults who are less than 70 are at particularly heightened risk but the over 70s are also at higher risk compared to those who are not self-isolating.
- Adults who are under 70 and self-isolating and adults self-isolating for 7-14 days are also at heightened risk of food insecurity arising from a lack of money for food.
- Taken together, these report findings show:
  - Vulnerability to food insecurity has worsened for the economically vulnerable under COVID-19 conditions.
  - The COVID-19 crisis has also created new economic vulnerability for people who experiencing income losses and self-isolation.
  - In addition to economic vulnerability, self-isolation and a lack of food in shops has created new dimensions of food insecurity in the UK: people being unable to acquire the food they need because they cannot go out and/or because food supplies are not available.

---

<sup>1</sup> For press release, see <https://foodfoundation.org.uk/wp-content/uploads/2020/04/Hunger-release-FINAL.pdf>

## Background

*How many people regularly struggle to afford enough food in Britain?*

Approximately 20% of adults (~10 million) in England, Wales, and Northern Ireland face food insecurity annually.[1] These estimates come from data collected by the Food Standards Agency (FSA). By this measure, food insecurity refers to people living with insecure access to food on account of financial vulnerability, meaning, they all reported, at minimum, having experienced anxiety about not having enough to eat, experiences of running out of food, or not eating balanced meals, all be because of a lack of money for food. More severe experiences, including running out of food or skipping meals because of a lack of money for food, affect about 10% of adults, and the most severe experiences, which mean adults have gone without food, affect about 4% of adults.<sup>2</sup>

There are some key groups who are more likely to experience food insecurity than others, including those with incomes that are in the very bottom of the income distribution, people who are unemployed or not working for other reasons, and people with disabilities.[2] These are groups that are highest risk of the most severe forms of food insecurity as well. Other groups are also at higher risk of less severe food insecurity in particular. These include adults with children and adults from Black, Asian and Minority Ethnic groups.[2] Pensioners experience lower risk of food insecurity when it is measured using this economic indicator,[2] though qualitative research among elderly people have found that some experience both economic and physical barriers to accessing sufficient amounts of food.[3]

This report explores how the COVID-19 crisis has changed vulnerability to food insecurity by examining and comparing characteristics associated with different forms of food insecurity and comparing these to what is known about risk of food insecurity in the population before the COVID-19 pandemic.

## Methodology

This analysis uses data from the Food Foundation's commissioned YouGov poll which ran over 7-9 April 2020.<sup>3</sup> The survey included a total of 4,343 adults aged 18 and over from across Great Britain. It was completed online and asked respondents about experiences of food insecurity including: (1) eating smaller meals or skipping meals; (2) being hungry but being unable to eat; and (3) not eating for a whole day, because they could not afford food or because they could not get access to food. Anyone who responded to one or more of these questions affirmatively was classed as food insecure.

These indicators were adapted from the United States Department of Agriculture's Food Security Survey module,[4] which is used to measure individual and household-level food insecurity in many high-income countries, including the UK. Normally, these questions are solely grounded in a lack of financial access to food; in light of concerns about food supply issues in shops and other worries about individuals being unable to access food on account of isolation, the additional clause "because you could not get access to food" was added.

Respondents who answered one or more of food insecurity questions affirmatively were then asked whether this was for any of the following reasons: (1) they did not have enough money for food; (2) the shops did not have the food they needed; (3) they could not go out and did not have any other way to get the food we needed; or (4) for other reasons.

---

<sup>2</sup> Author's analysis of Food and You Wave 5 data, available from <https://ukdataservice.ac.uk/>.

<sup>3</sup> See press release here: <https://foodfoundation.org.uk/wp-content/uploads/2020/04/Hunger-release-FINAL.pdf>

Alongside these food insecurity questions, respondents were asked about changes in income arising from COVID-19, whether or not they were currently self-isolating, whether or not they are normally invited to have a flu jab by their GP, and whether or not they have a child that receives free school meals. All respondents who complete the YouGov poll are also routinely asked about their employment status, where they live, household composition, gender, and marital status, among other socio-demographic variables, though these responses were not necessarily collected at the same time as the other questions.

All data were analysed using survey weights to be representative of the adult population of Great Britain. One limitation of these data is that they are unlikely to include adults who do not have regular access to the internet. As this is an indicator of economic vulnerability and older age, some groups may not be fully represented in these data.

## Findings

*The number of adults who are food insecure in Britain is estimated to have quadrupled under the COVID-19 lockdown.*

About 16.2% of adults surveyed reported experiences of food insecurity since Great Britain went into official lockdown, a three-week period since the 23<sup>rd</sup> of March. These experiences were: skipping or reducing the size of their meals, experiencing hunger but not eating, and/or going a whole day without eating because they could not afford or access food. An additional 21.6% of adults reported feeling very worried or fairly worried about getting the food they need during the COVID-19 outbreak.

These figures can be compared to the same questions used to measure food insecurity in the FSA's 2018 Food and You survey.<sup>4</sup> Here, however, adults are asked about experiences of food insecurity in the past 12 months, meaning they could have had these at any time in the past 12 months.

In 2018, only 7.63% of adults reported one or more of these same food insecurity experiences at some point in the past 12 months<sup>5</sup>, and an additional 0.75% reported worry about not having enough money for food.<sup>6</sup> When food insecurity is measured over a shorter period of 30 days, usually the prevalence is reduced by about half what is normally seen in a 12 month window. This is because for some households, food insecurity is transitory, not chronic.<sup>7</sup> If we apply this same rough calculation to the Food and You data, we would expect only 3.8% of adults in Britain to experience food insecurity in a 30-day period. Instead, about four times this prevalence was observed since the lockdown was announced, which covered an even shorter period at the time the survey was conducted.

---

<sup>4</sup> This survey covers England, Wales and Northern Ireland, whereas the YouGov data used here are for England, Wales and Scotland. Comparing food insecurity between respondents only from England and Wales from both surveys did not change the results.

<sup>5</sup> Author's analysis of the Food & You survey, wave 5, from 2018. All proportions weighted to be representative of the UK population.

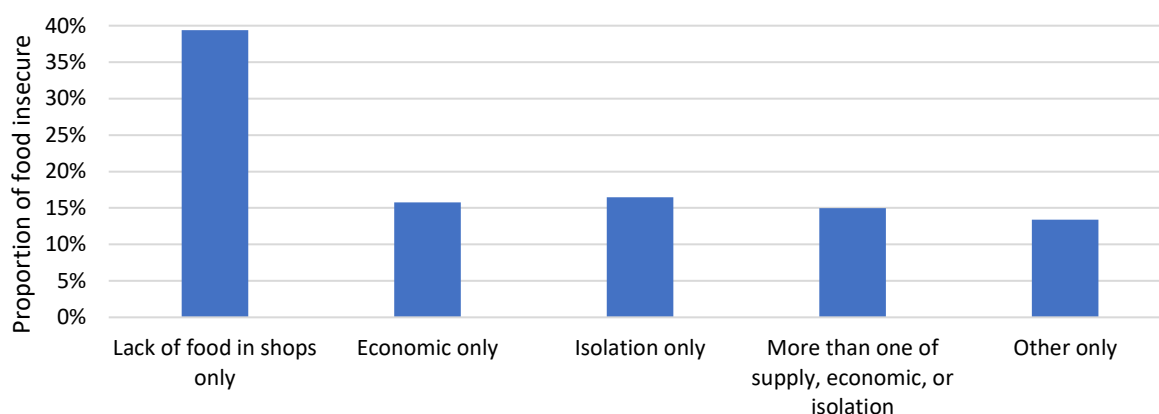
<sup>6</sup> It is important to note that these indicators only capture food insecurity arising from a lack of money for food. Other reasons for a lack of access to food are not measured in the UK, reflecting that food insecurity in high-income countries is not driven by a lack of food supply but a lack of economic access. Problems of physical access may arise for some, but for most, this is likely also to be linked to economic hardship, where people cannot afford food delivery or other help to access food.

<sup>7</sup> For a discussion of differences in measuring food insecurity over a 12-month time span and 30-day time span, see: <https://enuf.org.uk/research-blogs/food-insecurity-measurement-family-resources-survey>

*A lack of food in shops alone explained about 40% of food insecurity experiences since the COVID-19 lockdown.*

Part of the sharp rise in the numbers of adults experiencing food insecurity can be attributed to problems with food supplies in shops. As widely reported, Britons purchased an excess of £1 billion of food as fears about the coronavirus spread and households replaced out-of-home eating with food bought from supermarkets.<sup>8</sup> This led to dramatic supply chain issues, with many supermarkets experiencing acute shortages in basic food items. For some adults, these problems resulted in experiences of food insecurity: 6% of adults surveyed experienced food insecurity only because of a lack of food in shops since the lockdown. As a proportion of all adults who experienced food insecurity since the lockdown, this was 40% (Figure 1). As the food supply chain has now stabilised, we would expect these numbers to decline in the coming weeks.

Figure 1 Proportion of adults experiencing food insecurity arising from a lack of food in shops alone or for other reasons.



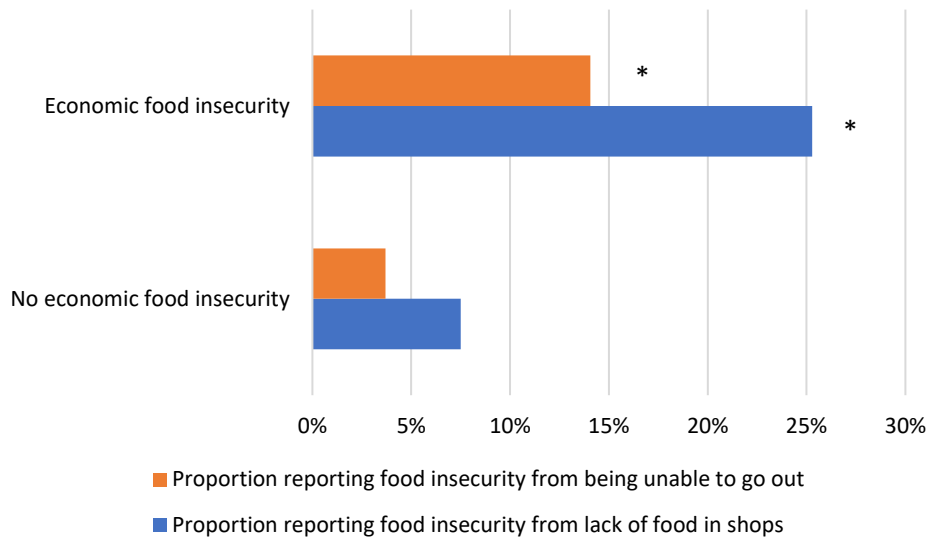
Importantly, however, about 60% of food insecure adults reported food insecurity for other reasons in addition to, or instead of food supply, issues (Figure 1). About 16% of these adults reported economic reasons alone for food insecurity and an equal proportion reported isolation alone. A further 15% reported a combination of these underlying their experiences of food insecurity, with the remaining reporting a reason other than any of these. The nature of “other” reasons for food insecurity was not explored.

*A lack of food in shops and isolation has exacerbated food insecurity for adults who are economically vulnerable to food insecurity.*

Adults who reported experiences of food insecurity arising from a lack of money for food since the lockdown were significantly more like to also report experiences of not having enough food arising from a lack of food in shops and/or being unable to obtain food on account of self-isolation (Figure 2).

<sup>8</sup> For example, see [https://www.bbc.co.uk/news/uk-51989721?intlink\\_from\\_url=https://www.bbc.co.uk/news/topics/cg5m4dg1jkl/stockpiling&link\\_location=live-reporting-story](https://www.bbc.co.uk/news/uk-51989721?intlink_from_url=https://www.bbc.co.uk/news/topics/cg5m4dg1jkl/stockpiling&link_location=live-reporting-story)

Figure 2 Risk of difficulty obtaining food due to lack of supply and self-isolation by economic food insecurity.



Notes: \* Comparisons of proportions between economic and no economic food insecurity significantly different. ( $p < 0.0001$ ).

It was also true that if someone reported having trouble accessing food because of supply issues, they were also more likely to report economic issues and self-isolation issues, and that if someone reported self-isolation as a driver, they were also more likely to report economic issues and supply issues. These findings suggest overlapping vulnerability to different forms of food insecurity at this time.

In the following analyses, we explore risk factors for any experience of food insecurity and those that specifically associated with food insecurity from economic, food supply, and isolation issues.

#### *Socio-economic and geographic risk factors for food insecurity since COVID-19 lockdown.*

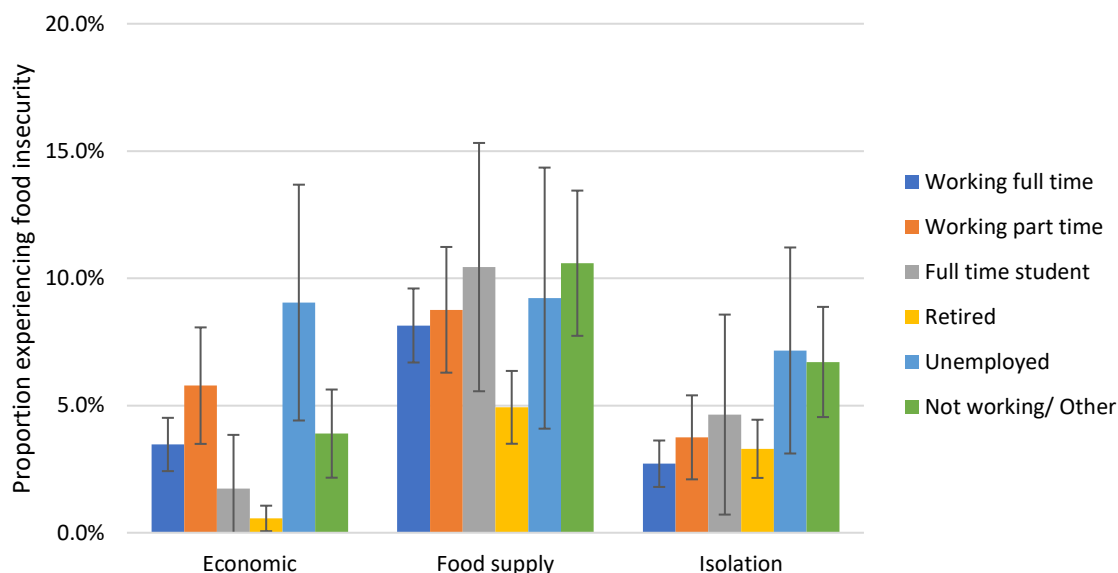
Table 1 presents multivariate logistic regression models that explore how socio-economic and geographical variables associate with risk of experiencing food insecurity since the COVID-19 lockdown. Characteristics associated with higher risk of economic food insecurity in the UK normally are also associated with risk of any food insecurity at this time and economic food insecurity in particular, since the COVID-19 lockdown. These include:

- Adults with life-limiting health conditions and disabilities,
- Adults with children in their household
- Adults who are unemployed
- Adults from Black, Asian and Minority Ethnic groups

These are all groups at higher risk of poverty in the UK.[5] Importantly, these socio-economic groups are also at higher risk of food insecurity arising for other reasons (Table 1). People who are unemployed are also at higher risk of experiencing food insecurity arising from isolation (Figure 3). Adults with children and adults with disabilities are also at higher risk of food insecurity arising from both a lack of food in shops and isolation. These findings suggest that COVID-19 conditions have exacerbated food insecurity for households already

vulnerable to food insecurity and chime with news reports<sup>9</sup> of people with disabilities and with children being unable to secure grocery deliveries and also being unable to access lower-cost brands, which are essential for people on limited incomes.

Figure 3 Adjusted proportions of adults experiencing food insecurity by employment status.



Notes: Predicted proportions from table 1, adjusted for socio-economic and geographic variables.

The COVID-19 crisis has also created vulnerability to food insecurity among groups not typically observed to be at higher risk. First, we see that compared to men, women are at lower risk of economic food insecurity at this time (Table 1), which is not typically the case in UK survey data.[2] This may suggest men have been more vulnerable to the economic impacts of COVID-19 on their food insecurity.<sup>10</sup>

Adults with part-time employment are also at higher risk of economic food insecurity compared to adults with full-time employment (Table 1 and Figure 3). This difference has not been characterised in the British population before due to a lack of data availability. As discussed below, adults with part-time employment, along with the unemployed, are a group particularly vulnerable to the economic impacts of the COVID-19 pandemic, which could also account for their heightened vulnerability to food insecurity arising from a lack of money for food.

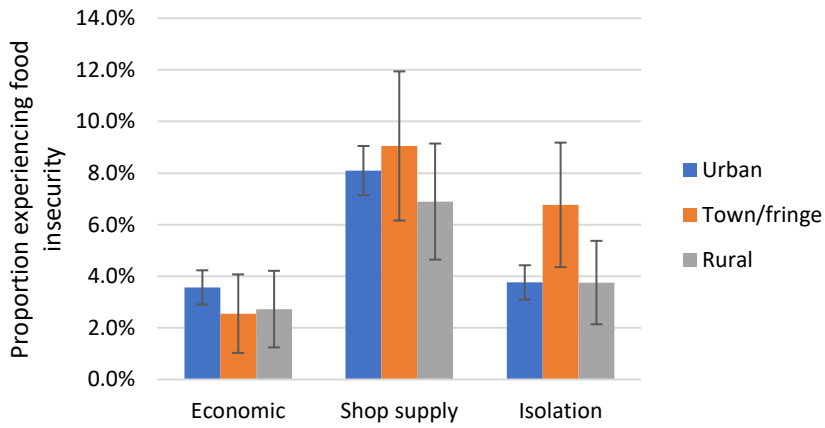
Consistent with UK national data on food insecurity, pensioners are at lower risk of economic food insecurity. They are also at lower risk of food insecurity arising from lack of food in shops. However, the risk of experiencing food insecurity due to isolation is about the same for people who are full-time employed and for those who are retired; this *lack* of difference stands in sharp contrast to wide discrepancy for adults experiencing food insecurity for economic and food supply issues (Figure 3). This leveling out of difference may be due to heightened risk for those who are over 70 and self-isolating.

<sup>9</sup> For example, see <https://www.theguardian.com/world/2020/mar/21/mps-plea-government-uk-covid-19-stockpiling-coronavirus>

<sup>10</sup> Women were significantly more likely to report losses than men in the survey data, though they were also more likely to report not knowing if they/their household has lost income.

Lastly, we observe a new risk group for food insecurity arising from an inability to go out to get food: living in a rural town or fringe area compared living in an urban area (i.e. major conurbation; minor conurbation or city and town). Rural areas (villages, hamlet and isolated dwellings) were not at higher risk, however (Figure 4).

Figure 4 Adjusted proportions of adults experiencing food insecurity by urban/rural dwelling.



Notes: Predicted proportions from table 1, adjusted for socio-economic and geographic variables.



Table 1 Socio-economic characteristics associated with experiences of food insecurity since the UK COVID-19 lockdown.

<i>Risk factors</i>	Any food insecurity			Food insecurity arising from economic hardship			Food insecurity arising from lack of food in shops			Food insecurity arising from inability to go out for food		
	OR	LB	UB	OR	LB	UB	OR	LB	UB	OR	LB	UB
Health condition/disability that limits activity												
No	Ref			Ref			Ref			Ref		
A lot	<b>4.49</b>	<b>3.43</b>	<b>5.87</b>	<b>5.82</b>	<b>3.39</b>	<b>9.99</b>	<b>3.94</b>	<b>2.78</b>	<b>5.58</b>	<b>4.69</b>	<b>2.90</b>	<b>7.59</b>
A little	<b>1.97</b>	<b>1.54</b>	<b>2.51</b>	<b>2.03</b>	<b>1.16</b>	<b>3.55</b>	<b>1.81</b>	<b>1.31</b>	<b>2.51</b>	<b>2.94</b>	<b>1.92</b>	<b>4.50</b>
Urban/rural class												
Urban	Ref			Ref			Ref			Ref		
Town and Fringe	1.16	0.86	1.56	0.68	0.33	1.38	1.18	0.79	1.75	2.09	1.33	3.28
Rural	0.85	0.64	1.14	0.70	0.36	1.38	0.82	0.55	1.23	0.93	0.54	1.61
Gender												
Male	Ref			Ref			Ref			Ref		
Female	0.85	0.70	1.03	<b>0.53</b>	<b>0.35</b>	<b>0.80</b>	0.85	0.66	1.09	1.03	0.73	1.47
Employment status (in past 3 months)												
Working full-time	Ref			Ref			Ref			Ref		
Working part time	1.23	0.93	1.64	<b>1.75</b>	<b>1.01</b>	<b>3.02</b>	1.09	0.74	1.59	1.41	0.79	2.51
Student	1.23	0.76	1.97	0.48	0.13	1.79	1.33	0.75	2.34	1.77	0.67	4.72
Retired	<b>0.64</b>	<b>0.48</b>	<b>0.84</b>	<b>0.15</b>	<b>0.06</b>	<b>0.40</b>	<b>0.58</b>	<b>0.39</b>	<b>0.85</b>	1.23	0.73	2.07
Unemployed	<b>2.48</b>	<b>1.60</b>	<b>3.84</b>	<b>2.93</b>	<b>1.45</b>	<b>5.91</b>	1.15	0.59	2.26	<b>2.86</b>	<b>1.35</b>	<b>6.06</b>
Not working/ Other	<b>1.50</b>	<b>1.11</b>	<b>2.01</b>	1.13	0.61	2.11	1.35	0.91	1.99	<b>2.66</b>	<b>1.57</b>	<b>4.52</b>
Ethnicity												
White/mixed ethnicity	Ref			Ref			Ref			Ref		
Black, Asian and Minority Ethnic	<b>1.65</b>	<b>1.05</b>	<b>2.60</b>	<b>2.28</b>	<b>1.13</b>	<b>4.60</b>	1.23	0.68	2.23	1.90	0.81	4.44
Not provided	1.35	0.92	1.97	0.82	0.31	2.21	1.49	0.93	2.37	1.68	0.89	3.18
Number of children												
None	Ref			Ref			Ref			Ref		
1	<b>1.63</b>	<b>1.24</b>	<b>2.13</b>	<b>1.76</b>	<b>1.01</b>	<b>3.07</b>	<b>1.74</b>	<b>1.24</b>	<b>2.45</b>	1.23	0.71	2.12
2	<b>1.64</b>	<b>1.22</b>	<b>2.20</b>	1.69	0.94	3.06	<b>1.49</b>	<b>1.01</b>	<b>2.20</b>	<b>2.10</b>	<b>1.22</b>	<b>3.62</b>
3+	<b>2.21</b>	<b>1.46</b>	<b>3.34</b>	<b>2.60</b>	<b>1.27</b>	<b>5.33</b>	<b>2.38</b>	<b>1.40</b>	<b>4.03</b>	1.89	0.82	4.32
Marital status												
Married/cohabiting	Ref			Ref			Ref			Ref		
Separated/divorced/widowed	<b>1.41</b>	<b>1.08</b>	<b>1.84</b>	1.46	0.81	2.65	1.05	0.71	1.55	<b>1.61</b>	<b>1.03</b>	<b>2.50</b>
Never married	<b>1.32</b>	<b>1.04</b>	<b>1.67</b>	1.51	0.96	2.39	<b>1.39</b>	<b>1.03</b>	<b>1.87</b>	1.24	0.79	1.95
<b>Observations</b>	4034			3994			3994			3994		

Notes: AOR, Adjusted odds ratio; LB, lower bound for 95% CI; UB, upper bound for 95% CI. Bold indicates a significant difference from the reference category.

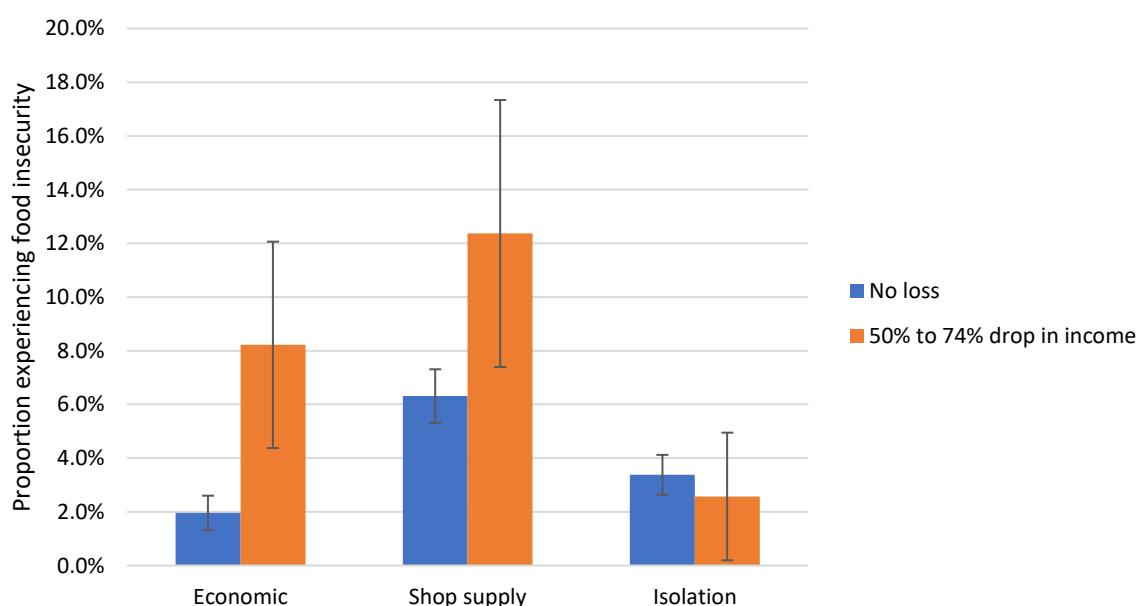
*Income losses arising from COVID-19 have put adults and their households at heightened risk of food insecurity.*

The COVID-19 crisis is having widespread economic impacts, resulting in rising unemployment and reduced work hours. Over 28% of adults surveyed reported losing income resulting from the COVID-19 crisis. An additional 12% did not know if they had lost income or did not want to share detail about how their incomes had been affected.

Worryingly, adults reporting losses of income resulting from the COVID-19 crisis are at significantly higher risk of food insecurity, even after accounting for background socio-economic status (Table 2). These findings are illustrated for adults who experienced an income loss of 50-75% in figure 5, highlighting the significantly higher rate of economic food insecurity for this group (8.2%) as well food insecurity arising from a lack of food in shops (12.4%) compared to adults who did not report a loss in income. The effect of an income loss did not differ by employment status.<sup>11</sup> These findings suggest that the financial impact of COVID-19 on food insecurity is far-reaching in the population, affecting adults with background socio-economic risk of food insecurity as well as those typically found not at risk.

In contrast, there was no difference in risk of food insecurity arising from isolation between those who had lost income and who had not (Table 2 and Figure 5).

Figure 5 Adults experiencing food insecurity by loss of income arising from COVID-19.



*Notes: Adjusted proportions from model shown in table 2, adjusted for socio-economic and geographic variables.*

After accounting for losses in income, we see that adults with part-time employment are no longer at higher risk of economic food insecurity (Table 2), suggesting that a loss of income due to COVID-19 explains economic vulnerability among the part-time employed. Figure 6 highlights how adults who were part-time employed or unemployed were more likely to report income losses from COVID-19.

<sup>11</sup> An interaction term between any income loss and employment status was added to the model shown in Table 3, but was not significant for any category.

Figure 6 Proportion of adults reporting income losses due to COVID-19 by employment status.

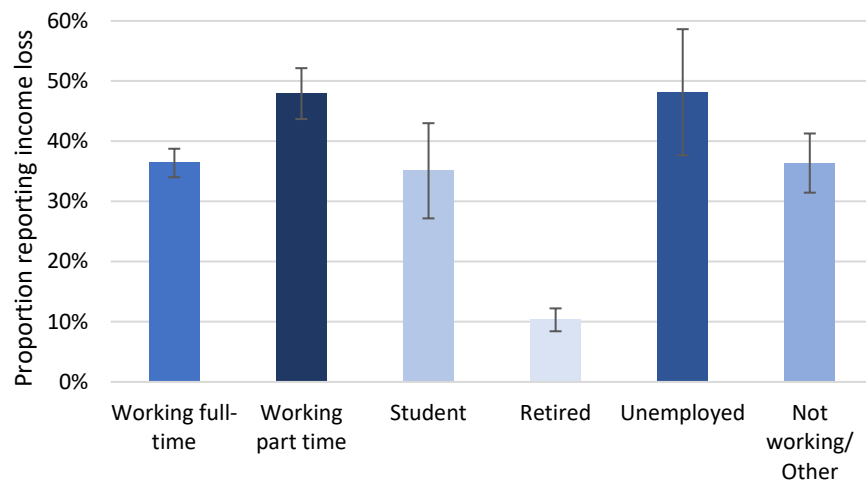


Table 2 Model additionally examining odds of food insecurity among adults who experienced losses in income arising from COVID-19.

<i>Risk factors</i>	Any food insecurity			Food insecurity arising from economic hardship			Food insecurity arising from lack of food in shops			Food insecurity arising from inability to go out for food		
	OR	LB	UB	OR	LB	UB	OR	LB	UB	OR	LB	UB
Health condition/disability that limits activity												
No	Ref			Ref			Ref			Ref		
A lot	<b>4.58</b>	<b>3.49</b>	<b>6.02</b>	<b>5.86</b>	<b>3.43</b>	<b>10.02</b>	<b>3.91</b>	<b>2.75</b>	<b>5.56</b>	<b>4.90</b>	<b>3.01</b>	<b>8.00</b>
A little	<b>1.98</b>	<b>1.55</b>	<b>2.53</b>	<b>2.05</b>	<b>1.15</b>	<b>3.63</b>	<b>1.81</b>	<b>1.30</b>	<b>2.52</b>	<b>2.92</b>	<b>1.90</b>	<b>4.49</b>
Employment status (in past 3 months)												
Working full-time	Ref			Ref			Ref			Ref		
Working part time	1.12	0.84	1.49	1.50	0.84	2.66	1.00	0.67	1.47	1.32	0.74	2.34
Student	1.16	0.72	1.86	0.50	0.13	1.88	1.35	0.77	2.39	1.70	0.64	4.55
Retired	0.72	0.54	0.96	0.20	0.07	0.52	0.67	0.45	1.00	1.26	0.74	2.15
Unemployed	<b>2.10</b>	<b>1.33</b>	<b>3.33</b>	<b>2.66</b>	<b>1.26</b>	<b>5.60</b>	1.10	0.56	2.13	<b>2.52</b>	<b>1.13</b>	<b>5.61</b>
Not working/ Other	<b>1.45</b>	<b>1.07</b>	<b>1.96</b>	1.12	0.60	2.11	1.39	0.94	2.05	<b>2.62</b>	<b>1.51</b>	<b>4.55</b>
Income loss resulting from covid-19												
No loss in income	Ref			Ref			Ref			Ref		
Up to a 24% drop in income	1.20	0.89	1.62	1.13	0.54	2.36	1.32	0.90	1.93	1.32	0.75	2.33
25% to 49% drop in income	<b>2.40</b>	<b>1.71</b>	<b>3.37</b>	<b>5.15</b>	<b>2.75</b>	<b>9.62</b>	<b>2.18</b>	<b>1.40</b>	<b>3.40</b>	1.74	0.91	3.33
50% to 74% drop in income	<b>2.82</b>	<b>1.88</b>	<b>4.22</b>	<b>5.02</b>	<b>2.57</b>	<b>9.81</b>	<b>2.17</b>	<b>1.29</b>	<b>3.64</b>	0.75	0.27	2.07
75% to 99% drop in income	<b>3.11</b>	<b>2.12</b>	<b>4.58</b>	<b>4.23</b>	<b>1.97</b>	<b>9.06</b>	<b>3.59</b>	<b>2.23</b>	<b>5.77</b>	1.92	0.94	3.95
We have lost all of our income	<b>2.07</b>	<b>1.15</b>	<b>3.72</b>	<b>4.42</b>	<b>1.91</b>	<b>10.23</b>	1.64	0.72	3.74	0.27	0.04	2.03
Don't know/prefer not to say	<b>1.71</b>	<b>1.26</b>	<b>2.32</b>	1.67	0.81	3.47	1.28	0.85	1.93	<b>1.78</b>	<b>1.07</b>	<b>2.95</b>
Observations	4034			3994			3994			3994		

Notes: AOR, Adjusted odds ratio; LB, lower bound for 95% CI; UB, upper bound for 95% CI. Bold indicates a significant difference from the reference category. Model also includes urban/rural class, number of children in household, gender, marital status and ethnicity but data not shown. See appendix for all model estimates.

### *Experiences of food insecurity among adults with children eligible for free school meals*

There has been significant concern that the closure of schools will increase food insecurity among families with children who normally receive a free school meal. These children may also benefit from other school food programmes, such as school breakfast clubs and holiday clubs. Whilst the government announced that provisions would be made for children receiving free school meals fairly soon after announcing the closure of schools, the delivery of this provision was patchy at first. In the last week of March, the Food Foundation reported results of their first YouGov poll which found over 50% of adults with children had not yet received a substitute for free school meals.<sup>12</sup> Whilst this proportion was reduced in the latest survey conducted just under three weeks after school closures, about 40% of adults still have children not receiving this assistance.<sup>13</sup>

Table 3 explores whether after adjusting for socio-economic and geographic characteristics, adults with children are at higher risk of reporting food insecurity. Only children from low income households are eligible for free school meals, so this indicator is often used as a marker of low socio-economic status. It is not necessarily surprising then that we see that adults with children eligible for FSM are more likely to experience economic food insecurity, though the fact that this is observed after accounting for employment status suggests that beyond economic indicators, adults with children eligible for FSM are at higher risk at this time. We also do not see that these adults are at higher risk of being unable to get food from shops. This may be because, as shown in table 3, adults with children are at significantly higher risk of food insecurity arising from a lack of food in shops. This suggests that the lack of basic food supplies in shops in recent weeks particularly impacted households with children.

---

<sup>12</sup> For press release, see <https://foodfoundation.org.uk/covid-19-latest-impact-on-food-2/>

<sup>13</sup> For the latest figures, see

**Table 3** Model additionally examining odds of food insecurity among adults with child(ren) eligible for free school meals.

<i>Risk factors</i>	Any food insecurity			Food insecurity arising from economic hardship			Food insecurity arising from lack of food in shops			Food insecurity arising from inability to go out for food		
	OR	LB	UB	OR	LB	UB	OR	LB	UB	OR	LB	UB
Number of children												
None	Ref			Ref			Ref			Ref		
1	<b>1.42</b>	<b>1.07</b>	<b>1.88</b>	1.44	0.80	2.58	<b>1.60</b>	<b>1.12</b>	<b>2.30</b>	1.04	0.57	1.91
2	<b>1.44</b>	<b>1.05</b>	<b>1.96</b>	1.35	0.70	2.62	1.35	0.90	2.02	1.72	0.98	3.03
3+	<b>1.68</b>	<b>1.08</b>	<b>2.62</b>	1.85	0.85	4.03	<b>1.98</b>	<b>1.13</b>	<b>3.47</b>	1.47	0.61	3.54
Child(ren) eligible for free school meals												
No	Ref			Ref			Ref			Ref		
Yes	<b>2.34</b>	<b>1.49</b>	<b>3.68</b>	<b>2.70</b>	<b>1.34</b>	<b>5.45</b>	1.47	0.84	2.58	2.12	0.99	4.52
Observations	4,006			3,968			3,968			3,968		

Notes: AOR, Adjusted odds ratio; LB, lower bound for 95% CI; UB, upper bound for 95% CI. Bold indicates a significant difference from the reference category. Model also includes employment status, disability urban/rural class, gender, marital status and ethnicity but data not shown See appendix for all model estimates. FSM, free school meals.

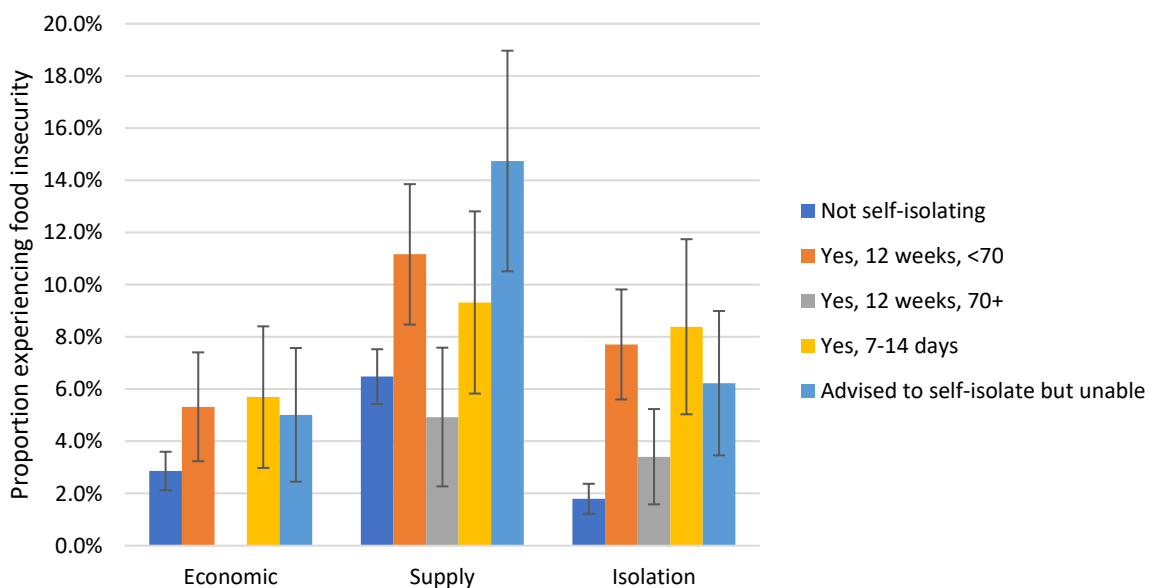
*Taking steps to isolate is driving adults to experience food insecurity.*

The last part of this analysis explores how guidelines for self-isolating and social distancing have impacted on food access. These include guidelines for self-isolating for 7 days if one is showing symptoms of coronavirus or 14 days if a household member shows symptoms. Adults who are 70 years of age or older, have long-term health conditions which make them vulnerable to COVID-19, or who are pregnant have been advised to follow stringent social distancing measures. Adults who have been identified as “extremely vulnerable” have been advised to self-isolate for 12 weeks and have been sent a letter to inform them of this. There is concern that this group of about 1.5 million adults dramatically underestimates vulnerability on account of health conditions in the population.

Being invited by a GP for a flu jab is an indicator of heightened health risk due to COVID-19. In table 4, it can be observed that adults who are under 70 but eligible for a free flu jab are a heightened risk of food insecurity arising from isolation. This group was also at higher risk of food insecurity arising from a lack of food in shops. We do not see higher risk of any forms of food insecurity among adults who are over 70, who are also routinely invited to have a free flu jab.

This picture changes dramatically when specific questions about isolation measures are asked. Here, anyone who identified as isolating, whether for a short period of time or for 12 weeks is a heightened risk of experiencing food insecurity arising from isolation (table 5; figure 7). We also see that some who have been advised to self-isolate, have been unable to do so. These adults also report higher risk of all forms of food insecurity, suggesting that some adults are unable to follow government guidance because they do not have the economic means or community, family, or government support to ensure that they can self-isolate. This has serious repercussions for both reducing the spread of the virus and preventing serious illness among those most vulnerable. Ensuring physical and economic food insecurity for everyone advised to self-isolate is key for enabling people to follow this advice.

Figure 7 Adjusted proportions of adults experiencing food insecurity by self-isolation status.



Notes: Adjusted proportions from table 5, adjusted for socio-economic and geographic variables.

**Table 4** Model additionally examining odds of food insecurity among adults with heightened vulnerability to COVID-19 on account of age or free flu jab eligibility.

Risk factors	Any food insecurity			Food insecurity arising from economic hardship			Food insecurity arising from lack of food in shops			Food insecurity arising from inability to go out for food		
	AOR	LB	UB	AOR	LB	UB	AOR	LB	UB	AOR	LB	UB
Heightened vulnerability to COVID-19												
No (<70, not invited for flu jab)	Ref			Ref			Ref			Ref		
70+	0.83	0.54	1.28	<i>Not estimable</i>			0.70	0.37	1.35	0.86	0.42	1.73
<70, flu jab	<b>1.35</b>	<b>1.09</b>	<b>1.67</b>	1.12	0.73	1.73	<b>1.44</b>	<b>1.09</b>	<b>1.91</b>	1.31	0.88	1.93
Observations	3926			3400			3888			3888		

Notes: AOR, Adjusted odds ratio; LB, lower bound for 95% CI; UB, upper bound for 95% CI. Bold indicates a significant difference from the reference category. Model also includes disability, employment status, urban/rural class, number of children in household, gender, ethnicity and marital status but data not shown. See appendix for all model estimates.

**Table 5** Model additionally examining odds of food insecurity among adults with heightened vulnerability to COVID-19 on account of self-isolation.

Risk factors	Any food insecurity			Food insecurity arising from economic hardship			Food insecurity arising from lack of food in shops			Food insecurity arising from inability to go out for food		
	AOR	LB	UB	AOR	LB	UB	AOR	LB	UB	AOR	LB	UB
Self-isolation												
Not self-isolating												
Yes, 12 weeks, <70	<b>2.21</b>	<b>1.70</b>	<b>2.86</b>	<b>1.97</b>	<b>1.14</b>	<b>3.40</b>	<b>1.85</b>	<b>1.31</b>	<b>2.61</b>	<b>4.79</b>	<b>3.03</b>	<b>7.59</b>
Yes, 12 weeks, 70+	1.02	0.68	1.54	<i>Not estimable</i>			0.74	0.40	1.38	<b>1.96</b>	<b>1.01</b>	<b>3.78</b>
Yes, 7-14 days	<b>2.36</b>	<b>1.69</b>	<b>3.29</b>	<b>2.13</b>	<b>1.16</b>	<b>3.91</b>	1.50	0.94	2.39	<b>5.28</b>	<b>3.01</b>	<b>9.25</b>
Advised to self-isolate but unable to	<b>2.28</b>	<b>1.64</b>	<b>3.17</b>	1.84	0.96	3.53	<b>2.57</b>	<b>1.73</b>	<b>3.84</b>	<b>3.77</b>	<b>2.07</b>	<b>6.85</b>
Observations	3994			3467			3955			3955		

Notes: AOR, Adjusted odds ratio; LB, lower bound for 95% CI; UB, upper bound for 95% CI. Bold indicates a significant difference from the reference category. Model also includes disability, employment status, urban/rural class, number of children in household, gender, ethnicity and marital status but data not shown. See appendix for all model estimates.



*Higher risk of food insecurity among people with health conditions/disabilities that limit their daily activities.*

Although noted in some earlier observations, it is worth highlighting that people with disabilities, defined by reporting health conditions and disabilities that limit their daily activities, are consistently at increased risk of food insecurity arising from all the major drivers during the COVID-10 crisis, including economic hardship, a lack of food in shops, and isolation. Whilst economic vulnerability to food insecurity for this group has been documented before, this research highlights that this group is also at risk of food insecurity for other reasons. In light of this evidence, there is an urgent need to ensure that people with disabilities are both financially able to access the food they need, as well as physically access this food, given that they are more seriously affected by a lack of food in shops and by isolation.

## **Conclusions**

The response to COVID-19 has exacerbated the food insecurity crisis in Britain. The proportion of adults reporting experiencing food insecurity are four times higher than we would expect in the population for a short window of time. Part of this increase can be attributed to shops running out of food as people started stocking their cupboards in anticipation of a lockdown and need to self-isolate. It has been reported that these issues are now mostly resolved and so we would expect to see food insecurity numbers reducing. However, this partially depends on access to cheaper food alternatives.

While supply chain issues might be temporarily resolved, economic hardships are likely to increase, and this will likely further exacerbate food insecurity. We are already beginning to see the effects on lost income on access to food, with many more adults reported an inability to afford sufficient food because of inadequate financial resources. As the economic downturn continues, it is likely that the numbers losing income will grow. For those who have already lost income, some may currently be managing by drawing from savings, credit cards, loans, and social networks. But these supports may not be sustainable or even available in the longer-term. People who have lost incomes but who are still waiting for government help may see their food insecurity resolved when this help arrives. In the meantime, however, food insecurity is a reality for too many who have been affected by the economic effects of the COVID-19 pandemic.

Importantly, we see that following advice to self-isolate is also a major driver of food insecurity at this time. This suggests that those following this guidance are not getting the food that they need. This risks the effectiveness of these measures, as people may be forced to go out to seek food, and there was evidence that this is already happening. Ensuring that people who are self-isolating are accessing the food they need is critical for ensuring these measures are followed.

## **Acknowledgments**

Many thanks to the Food Foundation, who shared their commissioned YouGov survey data, enabling these analyses to be conducted, and to The Food, Farming and Countryside Commission and Guy's and St Thomas' Charity, who funded the survey. Many thanks to Anna Taylor and Shona Goudie from the Food Foundation and Aaron Reeves from the University of Oxford for their feedback on the analysis and report.

Report author: Dr Rachel Loopstra, Lecturer in Nutrition, King's College London  
Contact: rachel.loopstra@kcl.ac.uk @rloopstra

## References

1. Fuller, E., et al., *The Food and You Survey, Wave 5: Combined report for England, Wales and Northern Ireland*. 2019, London: Food Standards Agency.
2. Loopstra, R., A. Reeves, and V. Tarasuk, *The rise of hunger among low-income households: an analysis of the risks of food insecurity between 2004 and 2016 in a population-based study of UK adults*. *J Epidemiol Community Health*, 2019. **73**(7): p. 668-673.
3. Purdam, K., A. Esmail, and E. Garratt, *Food insecurity amongst older people in the UK*. *British Food Journal*, 2019. **121**(3): p. 658-674.
4. United States Department of Agriculture. *Food security in the U.S.: Measurement*. 2017 [cited 2017 16 Oct].
5. Joseph Rowntree Foundation. *UK Poverty Statistics*. 2020 [cited 2020 12 April]; Available from: <https://www.jrf.org.uk/data>.

## Appendix

**Full display of all model covariates from table 2:** Model examining adjusted odds of food insecurity among adults who experienced losses in income arising from COVID-19.

<i>Risk factors</i>	Any food insecurity			Food insecurity arising from economic hardship			Food insecurity arising from lack of food in shops			Food insecurity arising from inability to go out for food		
	OR	LB	UB	OR	LB	UB	OR	LB	UB	OR	LB	UB
Health condition/disability that limits activity												
No	Ref			Ref			Ref			Ref		
A lot	<b>4.58</b>	<b>3.49</b>	<b>6.02</b>	<b>5.86</b>	<b>3.43</b>	<b>10.02</b>	<b>3.91</b>	<b>2.75</b>	<b>5.56</b>	<b>4.90</b>	<b>3.01</b>	<b>8.00</b>
A little	<b>1.98</b>	<b>1.55</b>	<b>2.53</b>	<b>2.05</b>	<b>1.15</b>	<b>3.63</b>	<b>1.81</b>	<b>1.30</b>	<b>2.52</b>	<b>2.92</b>	<b>1.90</b>	<b>4.49</b>
Urban/rural class												
Urban	Ref			Ref			Ref			Ref		
Town and Fringe	1.22	0.90	1.64	0.77	0.38	1.57	1.24	0.84	1.85	<b>2.11</b>	<b>1.34</b>	<b>3.34</b>
Rural	0.82	0.61	1.10	0.63	0.32	1.25	0.78	0.52	1.17	0.97	0.56	1.68
Gender												
Male	Ref			Ref			Ref			Ref		
Female	<b>0.82</b>	<b>0.67</b>	<b>0.99</b>	<b>0.51</b>	<b>0.33</b>	<b>0.78</b>	0.83	0.64	1.07	1.02	0.72	1.45
Employment status (in past 3 months)												
Working full-time	Ref			Ref			Ref			Ref		
Working part time	1.12	0.84	1.49	1.50	0.84	2.66	1.00	0.67	1.47	1.32	0.74	2.34
Student	1.16	0.72	1.86	0.50	0.13	1.88	1.35	0.77	2.39	1.70	0.64	4.55
Retired	0.72	0.54	0.96	0.20	0.07	0.52	0.67	0.45	1.00	1.26	0.74	2.15
Unemployed	<b>2.10</b>	<b>1.33</b>	<b>3.33</b>	<b>2.66</b>	<b>1.26</b>	<b>5.60</b>	1.10	0.56	2.13	<b>2.52</b>	<b>1.13</b>	<b>5.61</b>
Not working/ Other	<b>1.45</b>	<b>1.07</b>	<b>1.96</b>	1.12	0.60	2.11	1.39	0.94	2.05	<b>2.62</b>	<b>1.51</b>	<b>4.55</b>
Ethnicity												
White/mixed ethnicity	Ref			Ref			Ref			Ref		
BAME groups	1.54	0.98	2.43	<b>2.17</b>	<b>1.05</b>	<b>4.48</b>	1.18	0.65	2.17	1.98	0.84	4.69

Number of children	Not provided	1.27	0.86	1.87	0.77	0.27	2.18	1.43	0.89	2.31	1.55	0.81	2.94
	None	Ref			Ref			Ref			Ref		
	1	<b>1.62</b>	<b>1.22</b>	<b>2.13</b>	1.63	0.91	2.92	<b>1.70</b>	<b>1.20</b>	<b>2.41</b>	1.23	0.71	2.15
	2	<b>1.62</b>	<b>1.20</b>	<b>2.18</b>	1.57	0.86	2.87	1.45	0.98	2.16	<b>2.08</b>	<b>1.21</b>	<b>3.58</b>
	3+	<b>2.16</b>	<b>1.42</b>	<b>3.29</b>	<b>2.48</b>	<b>1.15</b>	<b>5.33</b>	<b>2.29</b>	<b>1.34</b>	<b>3.92</b>	1.89	0.84	4.27
Marital status	Married/cohabiting	Ref			Ref			Ref			Ref		
	Separated/divorced/widowed	<b>1.54</b>	<b>1.17</b>	<b>2.02</b>	1.81	0.97	3.40	1.15	0.77	1.71	<b>1.61</b>	<b>1.03</b>	<b>2.52</b>
	Never married	<b>1.35</b>	<b>1.06</b>	<b>1.72</b>	<b>1.61</b>	<b>1.01</b>	<b>2.57</b>	<b>1.44</b>	<b>1.06</b>	<b>1.95</b>	1.22	0.78	1.92
Income loss resulting from covid-19	No loss in income	Ref			Ref			Ref			Ref		
	Up to a 24% drop in income	1.20	0.89	1.62	1.13	0.54	2.36	1.32	0.90	1.93	1.32	0.75	2.33
	25% to 49% drop in income	<b>2.40</b>	<b>1.71</b>	<b>3.37</b>	<b>5.15</b>	<b>2.75</b>	<b>9.62</b>	<b>2.18</b>	<b>1.40</b>	<b>3.40</b>	1.74	0.91	3.33
	50% to 74% drop in income	<b>2.82</b>	<b>1.88</b>	<b>4.22</b>	<b>5.02</b>	<b>2.57</b>	<b>9.81</b>	<b>2.17</b>	<b>1.29</b>	<b>3.64</b>	0.75	0.27	2.07
	75% to 99% drop in income	<b>3.11</b>	<b>2.12</b>	<b>4.58</b>	<b>4.23</b>	<b>1.97</b>	<b>9.06</b>	<b>3.59</b>	<b>2.23</b>	<b>5.77</b>	1.92	0.94	3.95
	We have lost all of our income	<b>2.07</b>	<b>1.15</b>	<b>3.72</b>	<b>4.42</b>	<b>1.91</b>	<b>10.23</b>	1.64	0.72	3.74	0.27	0.04	2.03
	Don't know/prefer not to say	<b>1.71</b>	<b>1.26</b>	<b>2.32</b>	1.67	0.81	3.47	1.28	0.85	1.93	<b>1.78</b>	<b>1.07</b>	<b>2.95</b>
Observations		4034			3994			3994			3994		

**Full display of all model covariates from table 3:** Model additionally examining odds of food insecurity among adults with child(ren) eligible for free school meals.

<i>Risk factors</i>	Any food insecurity			Food insecurity arising from economic hardship			Food insecurity arising from lack of food in shops			Food insecurity arising from inability to go out for food		
	OR	LB	UB	OR	LB	UB	OR	LB	UB	OR	LB	UB
Health condition/disability that limits activity												
No	Ref			Ref			Ref			Ref		
A lot	<b>4.11</b>	<b>3.13</b>	<b>5.39</b>	<b>4.75</b>	<b>2.77</b>	<b>8.17</b>	<b>3.81</b>	<b>2.69</b>	<b>5.40</b>	<b>4.30</b>	<b>2.69</b>	<b>6.88</b>
A little	<b>1.94</b>	<b>1.52</b>	<b>2.48</b>	<b>1.93</b>	<b>1.12</b>	<b>3.34</b>	<b>1.81</b>	<b>1.30</b>	<b>2.51</b>	<b>2.90</b>	<b>1.89</b>	<b>4.44</b>
Urban/rural class												
Urban	Ref			Ref			Ref			Ref		
Town and Fringe	1.14	0.85	1.54	0.74	0.36	1.50	1.15	0.77	1.71	<b>2.09</b>	<b>1.33</b>	<b>3.31</b>
Rural	0.87	0.65	1.16	0.71	0.36	1.40	0.84	0.56	1.25	0.94	0.54	1.63
Gender												
Male	Ref			Ref			Ref			Ref		
Female	0.86	0.71	1.05	<b>0.55</b>	<b>0.36</b>	<b>0.83</b>	0.87	0.67	1.12	1.02	0.72	1.45
Employment status (in past 3 months)												
Working full-time	Ref			Ref			Ref			Ref		
Working part time	1.24	0.94	1.65	<b>1.76</b>	<b>1.02</b>	<b>3.02</b>	1.11	0.76	1.63	1.42	0.80	2.53
Student	1.24	0.77	1.99	0.48	0.13	1.81	1.41	0.80	2.49	1.86	0.71	4.88
Retired	0.64	0.49	0.85	0.16	0.06	0.42	0.58	0.40	0.86	1.21	0.73	2.02

	Unemployed	<b>2.38</b>	<b>1.52</b>	<b>3.71</b>	<b>2.85</b>	<b>1.41</b>	<b>5.77</b>	1.18	0.60	2.31	<b>2.57</b>	<b>1.18</b>	<b>5.63</b>
	Not working/ Other	<b>1.49</b>	<b>1.10</b>	<b>2.01</b>	1.14	0.62	2.10	1.35	0.91	2.01	<b>2.57</b>	<b>1.51</b>	<b>4.37</b>
Ethnicity	White/mixed ethnicity												
	BAME groups	<b>1.69</b>	<b>1.06</b>	<b>2.69</b>	<b>2.29</b>	<b>1.13</b>	<b>4.64</b>	1.32	0.73	2.39	1.99	0.85	4.62
	Not provided	1.39	0.94	2.04	0.86	0.32	2.30	1.54	0.96	2.45	1.75	0.93	3.30
Number of children	None	Ref			Ref			Ref			Ref		
	1	<b>1.42</b>	<b>1.07</b>	<b>1.88</b>	1.44	0.80	2.58	<b>1.60</b>	<b>1.12</b>	<b>2.30</b>	1.04	0.57	1.91
	2	<b>1.44</b>	<b>1.05</b>	<b>1.96</b>	1.35	0.70	2.62	1.35	0.90	2.02	1.72	0.98	3.03
	3+	<b>1.68</b>	<b>1.08</b>	<b>2.62</b>	1.85	0.85	4.03	<b>1.98</b>	<b>1.13</b>	<b>3.47</b>	1.47	0.61	3.54
Marital status	Married/cohabiting	Ref			Ref			Ref			Ref		
	Separated/divorced/widowed	<b>1.36</b>	<b>1.03</b>	<b>1.78</b>	1.40	0.78	2.54	1.03	0.69	1.53	1.56	0.99	2.44
	Never married	<b>1.29</b>	<b>1.02</b>	<b>1.64</b>	1.55	0.98	2.45	<b>1.36</b>	<b>1.01</b>	<b>1.84</b>	1.19	0.76	1.87
Child(ren) eligible for free school meals	No	Ref			Ref			Ref			Ref		
	Yes	<b>2.34</b>	<b>1.49</b>	<b>3.68</b>	<b>2.70</b>	<b>1.34</b>	<b>5.45</b>	1.47	0.84	2.58	2.12	0.99	4.52
Observations			4,006			3,968			3,968			3,968	

**Full display of all model covariates from table 4:** Model additionally examining odds of food insecurity among adults with heightened vulnerability to COVID-19 on account of age or free flu jab eligibility.

<i>Risk factors</i>	Any food insecurity			Food insecurity arising from economic hardship			Food insecurity arising from lack of food in shops			Food insecurity arising from inability to go out for food		
	OR	LB	UB	OR	LB	UB	OR	LB	UB	OR	LB	UB
Health condition/disability that limits activity												
No	Ref			Ref			Ref			Ref		
A lot	<b>4.03</b>	<b>3.06</b>	<b>5.30</b>	<b>5.73</b>	<b>3.25</b>	<b>10.11</b>	<b>3.47</b>	<b>2.44</b>	<b>4.95</b>	<b>4.06</b>	<b>2.50</b>	<b>6.61</b>
A little	<b>1.86</b>	<b>1.45</b>	<b>2.38</b>	<b>2.05</b>	<b>1.15</b>	<b>3.64</b>	<b>1.64</b>	<b>1.17</b>	<b>2.32</b>	<b>2.83</b>	<b>1.86</b>	<b>4.32</b>
Urban/rural class												
Urban	Ref			Ref			Ref			Ref		
Town and Fringe	1.15	0.85	1.55	0.71	0.35	1.44	1.12	0.75	1.69	<b>2.04</b>	<b>1.29</b>	<b>3.24</b>
Rural	0.89	0.66	1.19	0.74	0.38	1.46	0.83	0.55	1.26	0.92	0.52	1.61
Gender												
Male	Ref			Ref			Ref			Ref		
Female	0.87	0.72	1.05	<b>0.53</b>	<b>0.35</b>	<b>0.80</b>	0.85	0.66	1.11	1.10	0.77	1.58
Employment status (in past 3 months)												
Working full-time	Ref			Ref			Ref			Ref		
Working part time	1.19	0.89	1.59	<b>1.84</b>	<b>1.06</b>	<b>3.18</b>	1.08	0.73	1.59	1.38	0.76	2.50
Student	1.30	0.80	2.11	0.50	0.13	1.88	1.52	0.85	2.69	1.57	0.56	4.41
Retired	0.66	0.48	0.90	0.25	0.09	0.66	0.61	0.39	0.95	1.34	0.75	2.41
Unemployed	<b>2.21</b>	<b>1.40</b>	<b>3.48</b>	<b>2.63</b>	<b>1.29</b>	<b>5.36</b>	1.05	0.51	2.17	<b>2.79</b>	<b>1.29</b>	<b>6.04</b>
Not working/ Other	<b>1.49</b>	<b>1.10</b>	<b>2.01</b>	1.14	0.61	2.14	1.34	0.90	2.00	<b>2.68</b>	<b>1.57</b>	<b>4.57</b>
Ethnicity												
White/mixed ethnicity	Ref			Ref			Ref			Ref		
BAME groups	<b>1.67</b>	<b>1.05</b>	<b>2.68</b>	<b>2.48</b>	<b>1.23</b>	<b>5.02</b>	1.27	0.69	2.32	2.20	0.94	5.14
Not provided	1.41	0.95	2.08	0.83	0.31	2.22	1.60	1.00	2.56	1.79	0.94	3.41
Number of children												
None	Ref			Ref			Ref			Ref		

	1	<b>1.66</b>	<b>1.26</b>	<b>2.19</b>	<b>1.77</b>	<b>1.01</b>	<b>3.10</b>	<b>1.73</b>	<b>1.22</b>	<b>2.46</b>	1.26	0.72	2.22
	2	<b>1.69</b>	<b>1.25</b>	<b>2.28</b>	1.76	0.97	3.20	<b>1.52</b>	<b>1.02</b>	<b>2.26</b>	<b>2.18</b>	<b>1.25</b>	<b>3.81</b>
	3+	<b>2.18</b>	<b>1.44</b>	<b>3.30</b>	<b>2.62</b>	<b>1.26</b>	<b>5.45</b>	<b>2.24</b>	<b>1.32</b>	<b>3.80</b>	2.01	0.88	4.64
Marital status													
	Married/cohabiting	Ref			Ref			Ref			Ref		
	Separated/divorced/widowed	<b>1.43</b>	<b>1.09</b>	<b>1.88</b>	1.52	0.84	2.76	1.05	0.71	1.56	<b>1.66</b>	<b>1.07</b>	<b>2.59</b>
	Never married	<b>1.35</b>	<b>1.06</b>	<b>1.72</b>	1.54	0.97	2.46	<b>1.42</b>	<b>1.05</b>	<b>1.92</b>	1.25	0.78	2.00
Heightened vulnerability to covid-19													
	No (<70, not invited for flu jab)	Ref			Ref			Ref			Ref		
	70+	0.83	0.54	1.28	<i>Not estimable</i>			0.70	0.37	1.35	0.86	0.42	1.73
	<70, flu jab	<b>1.35</b>	<b>1.09</b>	<b>1.67</b>	1.12	0.73	1.73	<b>1.44</b>	<b>1.09</b>	<b>1.91</b>	1.31	0.88	1.93
Observations		3926			3400			3888			3888		



**Full display of all model covariates from table 5:** Model additionally examining odds of food insecurity among adults with heightened vulnerability to COVID-19 on account of self-isolation.

<i>Risk factors</i>	Any food insecurity			Food insecurity arising from economic hardship			Food insecurity arising from lack of food in shops			Food insecurity arising from inability to go out for food		
	OR	LB	UB	OR	LB	UB	OR	LB	UB	OR	LB	UB
Health condition/disability that limits activity												
No												
A lot	<b>3.38</b>	<b>2.56</b>	<b>4.47</b>	<b>4.29</b>	<b>2.47</b>	<b>7.45</b>	<b>3.04</b>	<b>2.10</b>	<b>4.41</b>	<b>2.98</b>	<b>1.84</b>	<b>4.83</b>
A little	<b>1.75</b>	<b>1.36</b>	<b>2.25</b>	<b>1.80</b>	<b>1.00</b>	<b>3.24</b>	<b>1.63</b>	<b>1.16</b>	<b>2.30</b>	<b>2.44</b>	<b>1.57</b>	<b>3.78</b>
Urban/rural class												
Urban												
Town and Fringe	1.11	0.82	1.51	0.69	0.34	1.40	1.12	0.75	1.68	<b>1.96</b>	<b>1.22</b>	<b>3.17</b>
Rural	0.88	0.65	1.18	0.75	0.37	1.49	0.85	0.57	1.28	0.97	0.55	1.70
Gender												
Male												
Female	0.84	0.69	1.02	<b>0.52</b>	<b>0.34</b>	<b>0.79</b>	0.84	0.65	1.09	1.01	0.71	1.45
Employment status (in past 3 months)												
Working full-time												
Working part time	1.23	0.92	1.65	1.73	0.99	3.01	1.10	0.75	1.63	1.48	0.81	2.71
Student	1.06	0.66	1.70	0.42	0.11	1.52	1.25	0.71	2.20	1.36	0.50	3.64
Retired	0.63	0.46	0.86	0.23	0.09	0.60	0.62	0.41	0.95	1.06	0.61	1.85
Unemployed	<b>2.20</b>	<b>1.40</b>	<b>3.46</b>	<b>2.63</b>	<b>1.31</b>	<b>5.27</b>	1.01	0.51	2.00	<b>2.26</b>	<b>1.06</b>	<b>4.84</b>
Not working/ Other	<b>1.40</b>	<b>1.04</b>	<b>1.90</b>	1.14	0.62	2.10	1.24	0.84	1.84	<b>2.54</b>	<b>1.48</b>	<b>4.34</b>
Ethnicity												
White/mixed ethnicity												
BAME groups	1.56	0.98	2.47	<b>2.25</b>	<b>1.13</b>	<b>4.48</b>	1.22	0.68	2.19	1.58	0.64	3.89
Not provided	1.24	0.83	1.86	0.79	0.29	2.20	1.36	0.83	2.21	1.46	0.75	2.86
Number of children												
None												
1	<b>1.53</b>	<b>1.16</b>	<b>2.01</b>	1.68	0.97	2.90	<b>1.62</b>	<b>1.15</b>	<b>2.29</b>	1.08	0.61	1.90

	2	<b>1.60</b>	<b>1.19</b>	<b>2.16</b>	1.64	0.91	2.94	1.44	0.97	2.14	<b>1.99</b>	<b>1.14</b>	<b>3.48</b>
	3+	<b>2.11</b>	<b>1.40</b>	<b>3.19</b>	<b>2.50</b>	<b>1.22</b>	<b>5.15</b>	<b>2.31</b>	<b>1.36</b>	<b>3.93</b>	1.68	0.71	3.96
Marital status													
	Married/cohabiting												
	Separated/divorced/widowed	<b>1.38</b>	<b>1.05</b>	<b>1.82</b>	1.52	0.83	2.76	1.02	0.68	1.52	1.54	0.98	2.43
	Never married	<b>1.32</b>	<b>1.04</b>	<b>1.68</b>	1.51	0.96	2.37	<b>1.39</b>	<b>1.03</b>	<b>1.87</b>	1.30	0.82	2.04
Self-isolation													
	Not self-isolating												
	Yes, 12 weeks, <70	<b>2.21</b>	<b>1.70</b>	<b>2.86</b>	<b>1.97</b>	<b>1.14</b>	<b>3.40</b>	<b>1.85</b>	<b>1.31</b>	<b>2.61</b>	<b>4.79</b>	<b>3.03</b>	<b>7.59</b>
	Yes, 12 weeks, 70+	1.02	0.68	1.54	<i>Not estimable</i>			0.74	0.40	1.38	<b>1.96</b>	<b>1.01</b>	<b>3.78</b>
	Yes, 7-14 days	<b>2.36</b>	<b>1.69</b>	<b>3.29</b>	<b>2.13</b>	<b>1.16</b>	<b>3.91</b>	1.50	0.94	2.39	<b>5.28</b>	<b>3.01</b>	<b>9.25</b>
	Advised to self-isolate but unable to	<b>2.28</b>	<b>1.64</b>	<b>3.17</b>	1.84	0.96	3.53	<b>2.57</b>	<b>1.73</b>	<b>3.84</b>	<b>3.77</b>	<b>2.07</b>	<b>6.85</b>
Observations			3994			3467			3955			3955	