

Duration of Lockdown and Mental Health

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Abstract

The Covid-19 pandemic and associated lockdown has disrupted mental well-being of individual. A number of studies provide evidence that lockdown is associated with higher level of stress and anxiety that contribute to deteriorating mental wellbeing of individuals. The general conclusion of those studies is unidirectional meaning more lockdown days lead to more deterioration of mental health. However, resilience argument state that if people get more time with families and loved ones, their resilience level will improve and as a result mental wellbeing improves as well. As lockdown brings the opportunity to spend more time with families, this study hypothesise that mental health gets affected at the early days of lockdown but starts to improve at a later stage. Using data from UK household longitudinal data and adopting appropriate statistical tests, this study finds that the relationship between lockdown days and mental health is U-shaped, meaning that mental health becomes worse in the early days of lockdown but improves at a later stage. We have found that mental health starts improving after 54 days since the start of lockdown for the full sample. The results also indicate that females adopt much quicker than males. The average time females take to recover is 34.4 days whereas males take 75 days to recover.

1. Introduction

Covid-19 in the UK, first recorded on the 29th of January 2020, started taking alarming proportion, propelling the government to initiate unprecedented first lockdown measures on March 24th, 2020 and continuing until May 12th, 2020. Over the time, the lockdown has been lifted in a phased manner. Later, due to the increase in cases local lockdown measure has been introduced in England where places are being categorised as either "Tier1", " Tier2" or " Tier3". However, given the second wave, a second national lockdown on November 5th, 2020 had been introduced in England, which runs until December 2nd. Northern Ireland is under a stricter set of lockdown measures, Scotland has moved several regions into its strongest lockdown rules, and Wales has finished its firebreak lockdown lasting for around two weeks. After December 2nd, prime minister Boris Johnson had announced that England would be placed under a new, enhanced, set of local lockdown tiers. Lockdown has brought a powerful and challenging environment on adult mental health due to social and economic costs.

Recent evidences suggest that COVID pandemic and associated lockdown have increased the severity of pre-existing mental health condition and caused new symptoms of mental disorder [1]. Mental health problem has serious policy implications as it accounts for about 15% of global economic burden in 2020 [2]. This estimate was without the consideration of global pandemic in 2020 and the actual share of mental health in global economic burden would be much higher. Therefore, policymakers need analysis examining whether adults can adapt to this new environment so that decisions on duration of lockdown can be made appropriately. Using four COVID-19 web survey waves of a national longitudinal cohort study from adult respondents in UK, and using the 12-item General Health Questionnaire (GHQ-12), a fixed effects analysis demonstrates that number of days since the first lockdown is associated with a U-shape relationship with mental health. This clearly shows the fact that although mental health condition

of wider population is affected by lockdown measures, there is self-sustaining resilience mechanism that help people to cope with adverse conditions and get out of anxiety, stress and trauma associated with pandemic and lockdown measures.

2. Brief Literature And Research Proposition

Although the non-pharmacological interventions (NPI) including physical/social distancing has been mainly used as an effective instrument to reduce the spread of COVID-19 pandemic; it brings adverse economic consequences and negatively associated with mental well-being [3,4,5,6]. UK monthly GDP was 9.1% lower in August 2020 compared to February 2020 and unemployment mounted to 4.8% during July to September 2020 even in presence of government-supported furloughs. Increasing emphasis has been laid on mental health consequences of the lockdown and the mental health burden of the COVID-19 crisis is now a public health research priority [7]. This emphasis is due to multi-faceted impact of lockdown measure on mental health such as unemployment, domestic violence, family separation, death of loved ones, social stigmatization, increased loneliness and work stress due to new and unconventional ways of working practices [8]. According to the UCL COVID-19 social study [9] the levels of anxiety and depression had decreased in early June as lockdown measures began to lift. Mental health problem in UK adult population is higher in April, May and June 2020 compared to 2017-2019. These evidences manifest the stronger association between lockdown and mental health condition.

The effect of COVID-19 pandemic and associated lockdown measures on mental health has been examined extensively covering a number of countries such as USA, UK, India, Italy, Portugal, Japan, China, Brazil, Spain, Iran, Pakistan, Saudi Arabia and others [8,10]. All those countries experience significant negative effect of lockdown on mental health. A possible explanation of this pronounced negative effect on mental health could be contagion effect [11]. The contagion psychology theory state that people tend to mirror the expression of emotions and behaviour of the crowd [12]. The more uncertain the situation is, the more prominent this behaviour will be. Therefore, as the lockdown exert mental pressure to many, the psychological contagion tends to spread this fear and anxiety to many more leading the mental health condition of overall population to an alarming state. Some of the authors have claimed that the negative psychological effect of pandemic may last for years [13,14]. Potential economic and social problems from COVID-19 pandemic may encourage anticipatory fear among people [15]. However, against these theoretical predictions of long-lasting mental health effect of COVID-19, there is counter intuitive thoughts that suggest that individuals possess psychological resilience that plays an important role in overcoming the adverse effect of stressful situations [15]. There is evidence that shows that resilient individuals experience less anxiety and are able to recover quickly from any adverse and stressful situation [16]. Support from family and friends is important source of psychological resilience [17]. During the lockdown, people get more chance to interact with family and friends and stay close to each other for relatively longer period of time. As a result, lockdown could be an opportunity to develop psychological resilience. Hence, the mental health condition may improve once individuals have time to develop and nurture these close relationships with family and friends. Therefore, the effect of lockdown on mental health should not be unidirectional which has been found in most of the studies that we have discussed

so far. Rather, we argue that although the mental health condition deteriorates at the initial phase of lockdown, as people get more time to spend time with their family and loved ones, they become more resilient and therefore mental health condition improves at the later phase of the lockdown.

Therefore, there is an urgency to understand the trajectory of mental health during lockdown with an emphasis on impact of the duration of the lockdown using a longitudinal dataset after controlling for other determinants of mental health. In this analysis we test the hypothesis whether number of days in lockdown shares a non-linear relationship on level of mental health using 4 waves of data, April, May, June and July 2020 from the UK Household Longitudinal Study (UKHLS) [18]. Based on the theoretical prediction of resilience and relevant empirical evidence as discussed above, we assume, in our analysis, that individuals have natural tendencies to be resilient that help them to cope with stress and anxiety caused by COVID-19 pandemic and associated lockdown measures. We focus on the Likert index which is a sum of 12 questions from the General Health Questionnaire (GHQ-12). The respondent can select from one of 4 responses for each question with higher values representing worse outcomes (0-3). We use the reverse-coded GHQ, so a higher score depicts better mental health. Figure 1 shows the average mental health for male and female: mental health of females is lower than their male counterpart over the sample period.

3. Data And Methods

In our data analysis, instead of using fixed effects regression, we use the correlated random effects regression as the traditional fixed effects would eliminate the time invariant covariates. The correlated random effects regression adds time averages of the covariates as additional explanatory variables to control for unobserved heterogeneity at the individual level without dropping the time invariant covariates. To understand the impact of the duration of the lockdown, we calculate the number of days in lockdown as the difference between the survey start date for each respondent and for each wave and March 24th, 2020, the date when lockdown had been announced in the UK. We also include the square of the days under lockdown as this would determine the optimal number of days for respondents to get adjusted to the new normal in terms of their level of mental well-being. The first survey took place after 31 days since lockdown while the last after 129 days since lockdown. Our work is therefore similar in spirit with [19], where the optimal number of days required to reduce transmission and ICU demands has been modelled.

We control for age (16-25, 26-25, 36-45, 46-55, 56-65, 66-75 and 75 plus (base category)), marital status (staying as couple (base) or not), ethnicity (White, Black, South-Asian, any other Asian, all others as base), government office region (12 of them), house ownership (owned outright, owned/being bought on mortgage, rented, all others as base), presence of 0-4 years aged child (none as base), employment status ((employed as base) self-employed, both employed and self-employed, not employed) and gender (male as base). For educational qualifications, we use information as reported in Wave 9 of the UKHLS. Given gender differences in reported mental well-being [Fig 1], we also perform separate analysis for male and female. The full-sample consists of 43000 respondents out of which 41.54% are males.

4. Results And Discussion

Sample characteristics are reported in Table 1. Average reverse-coded GHQ-12 scores were more for male (25.042, 95% CI: 24.965-25.119) than for female (23.315, 95% CI: 23.241-23.390). Mean GHQ scores increases with increase in age: 16–25 years aged respondents have a score of 22.334 (95% CI: 22.050-22.618) compared to 75 plus respondents showing a score of 25.355 (95% CI: 25.178-25.532). People from white (24.128, 95% CI: 24.072-24.184) and black (24.000, 95% CI: 23.488-24.512) ethnic background portrays higher average GHQ than others. Couple and respondents without any child aged between 0-4 shows higher average GHQ. Employed people is showing lower GHQ perhaps due to reduction in income, shift to homeworking, or due to work that would expose them to COVID-19 infection. Average GHQ is higher for those who owned a house.

Table 2 reports our regression results. We emphasize on the impact of the duration of the lockdown on mental health: for the whole-sample we observe that number of days since lockdown is associated with a negative coefficient of -0.015 [95% CI: -0.020, -0.010; p-val <0.0001] whereas the coefficient associated with the square of number of days since lockdown is positive [0.0001, 95% CI: 0.0001, 0.0002; p-val <0.0001] implying a U-shape relationship and the optimal number of days since lockdown as 54 days. Similarly for the male and female sample although the existence of U-shape relationship is valid; results document that females get adapted to lock down faster than the males (34.4 days versus 74 days). Consistent with [3], we find younger adults are mentally more depressed and it is less pronounced for the female sample. One young child aged between 0-4 [-0.573, 95% CI: -1.043 - -0.103; p-val=0.017] not working [-1.049, 95% CI: -1.389 - -0.708; p-val <0.0001] and living without partner increases [-0.849, 95% CI: -1.101 - -0.598; p-val <0.0001] mental distress more for females. Respondents belonging to Black ethnicity reveals a significant higher GHQ (2.068, 95% CI: 0.879 - 3.256; p-val = 0.001] compared to the base category of other ethnic background. This is particularly interesting especially given the higher incidence and Covid-19 related mortality faced by this group [20,21].

Table 1: Sample characteristics

Variables	No. of Observations	Unweighted Mean GHQ-12 score (95% CI)
Male	17864	25.042 (24.965-25.119)
Female	25136	23.315 (23.241-23.390)
Age 16-25	1899	22.334 (22.050-22.618)
Age 26-35	3756	22.639 (22.435-22.843)
Age 36-45	6270	23.081 (22.927-23.234)
Age 46-55	8845	23,737 (23.615-23.859)
Age 56-65	10119	24.181 (24.070-24.293)
Age 66-75	9026	25.303 (25.202-25.403)
Age 75 above	3085	25.355 (25.178-25.532)
No Child aged 0-4	39807	24.106 (24.050-24.163)
One Child aged 0-4	2516	23.102 (22.862-23.342)
Two or more Child aged 0-4	677	23.160 (22.715-23.604)
Owned house outright	21090	24.919 (24.848-24.989)
Owned on mortgage	14930	23.694 (23.601-23.786)
Rented	6062	22.074 (21.901-22.246)
Others ¹	918	22.133 (21.708-22.558)
White	39485	24.128 (24.072-24.184)
South-Asian	1688	22.688 (22.361-23.016)
Any Other Asian	424	23.608 (23.072-24.145)
Black	628	24.000 (23.488-24.512)
Other Ethnicity	775	22.356 (21.887-22.825)
Employed	20792	23.850 (23.773-23.926)
Self-Employed	3163	24.150 (23.954-24.345)
Both employed/self-employed	854	24.148 (23.767-24.528)
Not employed	18191	24.216 (24.129-24.303)
Living as couple	31235	24.470 (24.409-24.530)
Not living as couple	11765	22.873 (22.756-22.990)
Degree	15884	24.033 (23.946-24.121)
Other higher degree	6028	23.985 (23.840-24.129)
A-level	8748	23.982 (23.860-24.105)
GCSC	7580	23.894 (23.759-24.030)
Other qualifications	2948	24.541 (24.333-24.749)
No qualifications	1812	24.182 (23.906-24.457)

Table 2: Results from Regression Analysis

	(1) Full Sample Coef.[95% CI; p-val]	(2) Male Sample Coef.[95% CI, p- val]	(3) Female Sample Coef.[95% CI, p-val]
Age 16-25	-2.334 [-2.940,-1.728; <0.0001]	-2.494 [-3.523,-1.466; <0.0001]	-2.203 [-2.997,-1.409; <0.0001]
Age 26-35	-2.365 [-2.910,-1.820; <0.0001]	-2.472 [-3.299,-1.645; <0.0001]	-2.245 [-2.998,-1.491; <0.0001]
Age 36-45	-2.282 [-2.776,-1.788; <0.0001]	-2.872 [-3.606,-2.137; <0.0001]	-1.904 [-2.591,-1.218; <0.0001]
Age 46-55	-1.777 [-2.217,-1.336; <0.0001]	-2.140 [-2.764,-1.516; <0.0001]	-1.538 [-2.169,-0.907; <0.0001]
Age 56-65	-1.373 [-1.760,-0.98; <0.0001]	-1.668 [-2.197,-1.138; <0.0001]	-1.160 [-1.731,-0.588; <0.0001]
Age 66-75	-0.147 [-0.483,0.189; =0.391]	-0.304 [-0.729,0.122; =0.162]	-0.009 [-0.530,0.513; =0.975]
Age 75 plus			
No Child aged 0-4			
One Child aged 0-4	-0.214 [-0.556,0.127; =0.218]	0.359 [-0.125,0.843; =0.146]	-0.573 [-1.043,-0.103; =0.017]
Two or more Child aged 0-4	0.058 [-0.708,0.823; =0.883]	-0.594 [-1.652,0.464; =0.271]	0.582 [-0.444,1.608; =0.266]
Owned house outright	1.456 [0.928,1.984; <0.0001]	1.039 [0.234,1.844; =0.011]	1.628 [0.942,2.314; <0.0001] Continued
Owned on mortgage	0.845 [0.322,1.367; =0.002]	0.636 [-0.143,1.416; =0.110]	0.863 [0.176,1.550; =0.004]
Rented	-0.363 [-0.923,0.197; =-0.204]	-0.813 [-1.652,0.027; =0.058]	-0.201 [-0.932,0.530; =0.590]
Others			

White	0.854	0.917	0.798
	[0.063,1.644; =0.034]	[-0.247,2.082; =0.123]	[-0.277,1.873; =0.146]
South-Asian	0.267	0.311	0.216
	[-0.694,1.229; =0.586]	[-1.062,1.684; =0.657]	[-1.116,1.548; =0.751]
Any other Asian	0.863	-0.118	1.508
	[-0.339,2.064; =0.159]	[-1.881,1.645; =0.895]	[-0.096,3.112; =0.065]
Black	2.068	1.344	2.442
	[0.879,3.256; =0.001]	[-0.628,3.316; =0.182]	[0.933,3.951; =0.002]
Other Ethnicity			
Employed			
Self-Employed	-0.411	-0.379	-0.479
	[-0.739,-0.084; =0.014]	[-0.823,0.066; =0.095]	[-0.972,0.013; =0.057]
Employed & self-employed	0.001	0.104	-0.102
	[-0.606,0.607; =0.999]	[-0.689,0.897; =0.797]	[-0.989,0.785; =0.822]
Not employed	-1.048	-1.064	-1.049
	[-1.312,-0.784; <0.0001]	[-1.480,-0.647; <0.0001]	[-1.389,-0.708; <0.0001]
Male			
Female	-1.423		Continued
	[-1.608,-1.238; <0.0001]		
Living as couple			
Not living as couple	-0.706	-0.432	-0.849
	[-0.892,-0.521; <0.0001]	[-0.687,-0.176; =0.001]	[-1.101,-0.598; <0.0001]
Degree			
Other higher degree	-0.145	0.142	-0.334
	[-0.433,0.143; =0.322]	[-0.300,0.583; =0.530]	[-0.715,0.048; =0.086]
A-level	0.060	0.291	-0.110

	[-0.196,0.316; =0.646]	[-0.072,0.654; =0.116]	[-0.470,0.249; =0.548]
GCSC	-0.097	0.414	-0.423
	[-0.373,0.178; =0.488]	[0.017,0.810; =0.041]	[-0.799,-0.047; =0.027]
Other qualification	0.214	0.506	0.010
	[-0.176,0.603; =0.282]	[-0.035,1.048; =0.067]	[-0.539,0.558; =0.972]
No qualification	-0.032	0.004	-0.067
	[-0.531,0.468; =0.901]	[-0.745,0.754; =0.991]	[-0.733,0.599; =0.844]
No. of days under lockdown	-0.015	-0.025	-0.008
	[-0.020,-0.010; <0.0001]	[-0.032,-0.019; <0.0001]	[-0.015,-0.001; =0.019]
Square of days	0.0001	0.0002	0.0001
	[0.0001,0.0002; <0.0001]	[0.0001,0.0002; <0.0001]	[0.0001,0.0002; <0.0001]
Constant	27.856	31.552	24.540
	[13.478,42.234; <0.0001]	[10.262,52.842; <0.0001]	[5.072,44.008; <0.0001]
Optimal No. of days since lockdown	54 days	74 days	34.4 days
N	43000	17864	25136

5. Conclusion

The recent surge in COVID-19 pandemic around the world has forced almost every country to impose various nonclinical measures to combat the spread of the infection. Lockdown measures are among the most effective measures that has been introduced in many countries including UK. A number of studies find negative effect of lockdown on mental health. However, individuals have natural resilience capability which might help them to cope with the stress and anxiety. The resilience hypothesis postulates that spending more time with families and love and caring from them may improve resilience. Therefore, the lockdown which facilitates individuals to spend more time with their families and loved ones should create the opportunities to build resilience over the time and should improve the mental health at a later stage. This study examines this using data from UK Household Longitudinal Study and find that the relationship between lockdown days and mental health is U-shaped. This means that although mental health condition deteriorates initially but starts to improve at a later stage. The study finds that the inflexion point is 54 days for the overall sample and females adopts quicker than males. Our results are robust for various other data characteristics which have been discussed.

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Figures

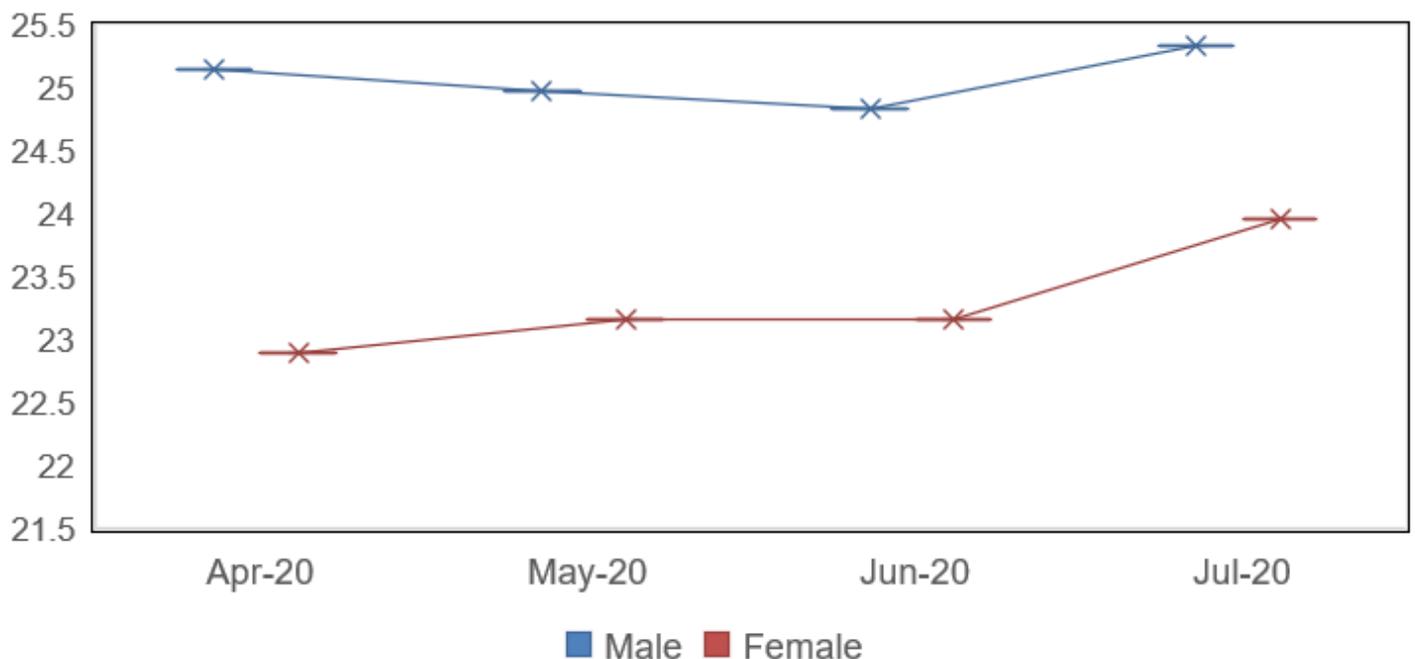


Figure 1

Average Mental Health (GHQ-Likert Scale)

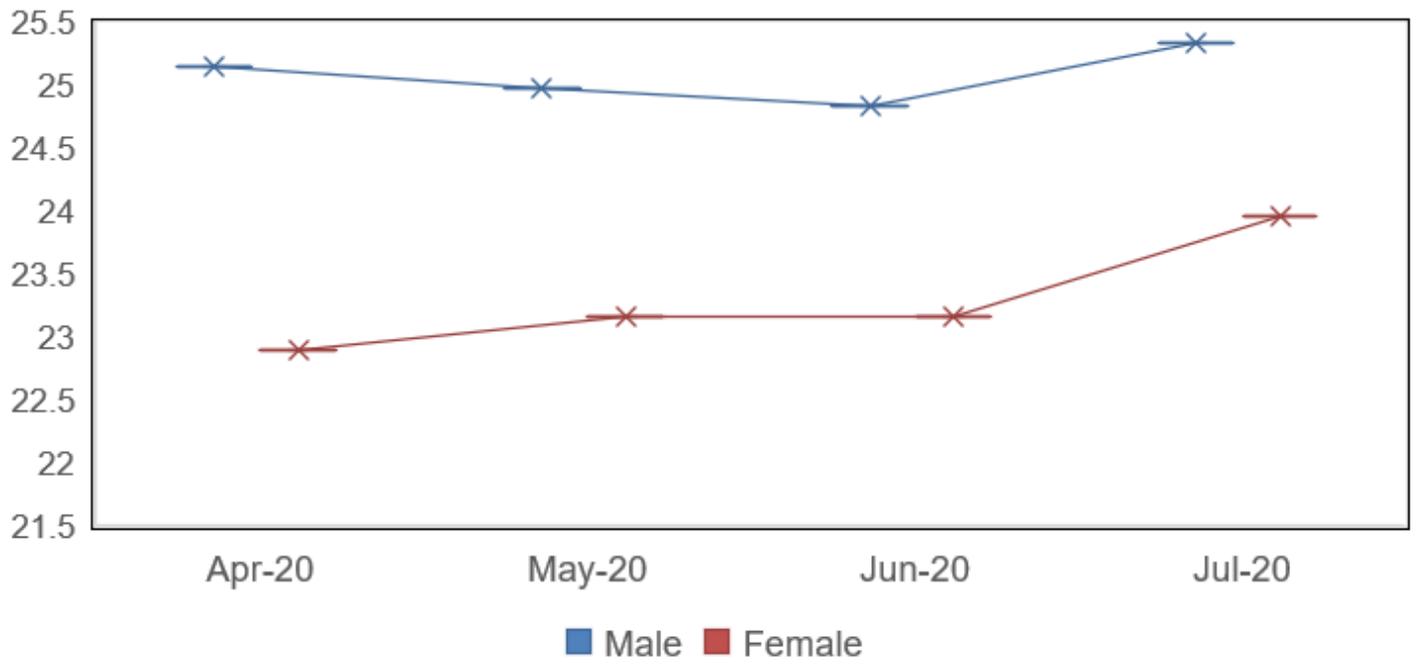


Figure 1

Average Mental Health (GHQ-Likert Scale)