RESEARCH ARTICLE

Long-term depression following stressful life events: feeling 'worthless' shows the slowest recovery

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ABSTRACT

This paper uses a UK panel study dataset, to investigate effects of stressful 'life events' on mental health. Various events – including poverty, unemployment, and illness – increase the risk of depression. There may be delayed effects of a stressful event: many people experience a slow recovery from depression. This paper reports evidence that in 'General Health Questionnaire' GHQ-12, feeling 'worthless' shows the slowest recovery after a harmful event: up to about nine years. Evidence in this paper is reported as charts, showing gradual recovery from traumatic events; and regression analysis. These charts are broadly consistent with regression results.

Keywords: Depression; life events; slow recovery; GHQ-12; worthlessness

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1. Introduction

1.1 Overview: Healthcare professionals disagree on what depression is; terms like 'mild depression' are often used without clear definitions. Depression is often diagnosed using 'International Classification of Diseases' (ICD-10), or 'Diagnostic and Statistical Manual of Mental Disorders' (DSM) (Thapar et al., 2010; WHO, 2015). There is too much research on depression to summarise it all here; some aspects are discussed below.

This paper investigates connections between a 'life event' – such as becoming unemployed – and depression. Holmes & Rahe (1967) produced a 'Social Readjustment Rating Scale', including positive and negative events. Kinderman et al. (2013, p.1) claimed "It is universally accepted that biology, the environment, and adverse life events collectively cause mental problems". Hammen (2005) and Allen (2006) claim depression often follows a harmful 'life event'; depression can be caused by several small events, or one severe event. In this paper, 'victim' is a person facing a stressful life event. Some events seem self-inflicted (e.g. gambling debts). A sense of failure, low self-esteem, and lack of self-confidence increase depression risk (Allen, 2006).

Most research on stress and depression use cross-section data; but longitudinal studies are preferable (Hammen, 2005). A panel study is appropriate: researchers can observe a stressful event (e.g. redundancy) in one year, and effects (e.g. depression) in subsequent years. This paper uses British Household Panel Survey data, and the follow-up 'Understanding Society' survey. Empirical evidence is reported using a graphical approach, which (as far as the author is aware) has not been published before; and regression analysis.

1.2 What is 'depression'? Callander & Schofield (2015, p.1548) define 'psychological distress' as "anxiety and depression symptoms, including nervousness, sadness, restlessness, hopelessness, and worthlessness". Martell et al. (2001) see depression as a response to problems: behaviour such as withdrawal, avoidance and inactivity might be 'coping strategies'. Allen (2006) discusses 'conservation-withdrawal', leading a depressed person to be less active; 'incentive disengagement', in which depression persuades a person to abandon goals impossible to achieve; and 'involuntary subordination', in which depression might protect an abused person – by preventing them arguing with their abuser.

Anxiety is not clearly distinguished from depression: they could be alternative diagnoses of one underlying problem (NIMH, 2016). Allen (2006) claimed anxiety is an excess of negative emotion, whereas depression is a deficiency of positive emotion. Sheldon (2011) sees a continuum: anxiety at one end, depression at the other end. Røysamb et al. (2011) found a spectrum of inter-related mental health problems – including depression and Generalized Anxiety Disorder (GAD). Depression is often preceded by GAD (Moffitt et al., 2007); anxiety may cause depression (NIMH, 2016; Woody & Gibb, 2015).

1.3 Do some events cause depression? Depression has many causes; one cause is a stressful event (Post, 1992; WHO, 2015). Factor analysis by Roohafza et al. (2011), studying effects of 46 life events on depression, produced eleven 'domains': home life, financial problems, social relations, personal conflicts, job conflicts, educational concerns, job security, loss and separation, sexual life, daily life, and health concerns. Hassanzadeh et al. (2017) take these eleven domains, and group them into two categories: 'Personal stressors' (home life, educational concerns, loss and separation, sexual life, health concerns); and 'Social stressors' (financial problems, social relations, personal conflicts, job conflicts, job security, daily life). Events causing depression often involve humiliation (e.g. rejection by spouse), entrapment (ongoing problems such as housing), or bereavement (Allen, 2006; Hammen, 2005).

Wethington (2016) claimed four types of stress assessment dominate research:

- Life events: out-of-the-ordinary events such as divorce or abuse, that can change behaviour;
- Stress appraisals: self-reported degree of stressfulness of demands & threat from events;
- Chronic stressors: long-term problems – enduring or re-occurring difficulties and strains;
- Hassles: minor & less emotionally-arousing daily incidents, whose effects fade in a day or two.

Some writers distinguish 'fateful' events such as bereavement which victims can't control, from 'dependent' events which victims could have prevented (Allen, 2006; Hammen, 2005). This distinction is hard to investigate: for example, a financial crisis may be due to a self-generated problem such as gambling, or 'fateful' events such as robbery. If injured when mountain-climbing, a victim might blame themself; or blame fate. The end of a relationship has a higher depression risk if the victim interprets it as due to his/her personal failure (Hammen, 2005).

Life events are harmful in various ways – for example, death of a spouse can cause immediate sadness/depression; and disrupt the victim's lifestyle, including loss of spouse's income (Holt et al., 2012). Regarding how stressful a 'life event' is, the *environmental* approach investigates severity of stress; whereas the *psychological* perspective emphasises the victim's perspective on how stressful it is – how well s/he can cope with the event (Hammen, 2005; Wethington, 2016). Allen (2006:82) claims genetics influences how people cope with stress.

1.4 Endogenous stress: Researchers disagree whether a stressful event inevitably increases risk of depression, or whether depression is due to the victim's distorted perception of the event (Allen, 2006). Gathergood (2012) claimed a person is more likely to see a particular debt as a 'problem' if s/he is depressed. Meltzer et al. (2012) claimed causality can work in two directions: people with debts are more likely to be depressed, and depressed people are more likely to be in debt.

Some personality-types may self-generate depression, by behaving in a depressed way: being pessimistic & irritable, eroding personal relationships (Hammen, 2005; Swindle et al., 1989). Hammen (2005) contrasts 'nonendogenous stress' (in which a stressful life event precedes depression in the victim) with 'endogenous stress' (which can occur without a preceding life event – perhaps because the victim has a 'melancholic' personality). However, Hammen (2005) warns against interpreting endogenous depression as being without cause: many endogenous depressive people had a preceding stressful life event. Allen (2006, p.124) wrote "being depressed creates additional life stress. Thus researchers studying the relationship between life stress and depression have been challenged to sort out the chicken-and-egg problem: which came first, the stress or the depression?"

1.5 Recovering from a stressful event: Some researchers investigate delayed effects of events on depression: for example, Holt et al. (2012) analysed effects of life events in the preceding 12 months. It takes time to recover from an episode of major depression; some people experience 'chronic depression' or 'dysthymic disorder', lasting at least 2 years (Allen, 2006).

Allen (2006) claims there are five stages ("five Rs") in a typical case of depression: response; remission; relapse; recovery; and recurrence. Mueller & Leon (1996) report evidence from University of Iowa Psychopathic Hospital: 18% of depressed patients were 'chronically' (long-term) depressed. Netuveli et al. (2008) found people more likely to recover from adversity if they had social support: someone to talk to.

There are controversies about how depression should be treated – perhaps by anti-depressant medicine such as Selective Serotonin Reuptake Inhibitors (SSRI), or a 'talking cure' such as Cognitive Behavioural Therapy (CBT) (Thapar et al., 2010). Some doctors in the UK National Health Service consider anti-depressant medication should be the main treatment for depression; others prefer a 'talking cure' such as CBT (Iacoviello et al., 2014; Iddon & Grant, 2013). Anti-depressant medication can speed up recovery (Harmer et al., 2009). Vittengl et al. (2014, p.11) studied depressed patients treated with Fluoxetine, or cognitive therapy; in both groups, "most patients remitted (97%) and recovered (94%) within 32 months".

Kinderman et al. (2013) discuss the 'biopsychosocial model', which claims psychological processes influence the effects of biology, society, and life events on mental health. They report two dominant schools of thought: a 'biomedical approach' considers biology (genetics, or genetics & environment) central in causing mental health problems – suggesting medication is an appropriate treatment; or that biology, society, and life events cause mental health problems via psychological processes, supporting psychology-based treatments such as CBT (Kinderman et al., 2013).

1.6 General Health Questionnaire: This paper analyses data from the widely-used 'General Health Questionnaire'; it has various uses among mental health

professionals – including a 'screening tool', to assess depression (Gao et al., 2004; Goldberg et al., 1997). Some versions of GHQ have 60 questions (Goldberg et al., 1997); this paper uses the version with 12 questions (see appendix). Each question asks the respondent to choose one of 4 answers. Each GHQ-12 answer is numbered, a high score implying depression. GHQ-12 provides an overall score; many researchers use 1 or more of the 12 questions as a 'factor', in factor analysis (Gao et al., 2004). Smith et al. (2013) claimed that an individual factor (rather than GHQ-12 as a whole) may help clinicians identify a more specific issue than anxiety/depression as a whole.

2. Methods

2.1 Sample: This paper analyses data from the 'British Household Panel Survey', a nationally-representative survey of Britain from 1991; a Northern Ireland sample was added from wave 7 (Taylor et al., 2010). This became part of the much larger 'Understanding Society' survey from 2009, conducted by 'Institute for Social and Economic Research'. This paper uses 'BHPS' as a shorthand for 'British Household Panel Survey' and 'Understanding Society' data combined.

BHPS aim to interview each (adult) respondent once per year. BHPS surveys ask "Do you have any of the health problems or disabilities listed on this card? … Anxiety, depression or bad nerves, psychiatric problems" (Taylor et al., 2010). 'Understanding Society' surveys report 'Clinical depression': patients diagnosed by a medical professional.

BHPS variables EVENT1 to EVENT4 report 81 'life events' such as divorce; other sources use different categories, e.g. Roohafza et al. (2011) include addiction. These variables aren't used in this paper, because the longest period BHPS surveys ask this question in consecutive waves is 1992 to 1995. To investigate longer-term effects, this paper uses variables in all BHPS waves – such as poverty.

The graphical approach in this paper is (as far as the author is aware) new: it produces a variable – on the horizontal axis, in all 6 Figures – varying from 'event in year before interview' (left-hand-side) to 'not in 11 years before interview' (right-hand-side). This spectrum shows recovery after a traumatic event. The left-hand-side of each Figure reports how victims felt if the event occurred recently. As we move from left to right, we see increasing delays between the stressful event, and the interview asking about depression.

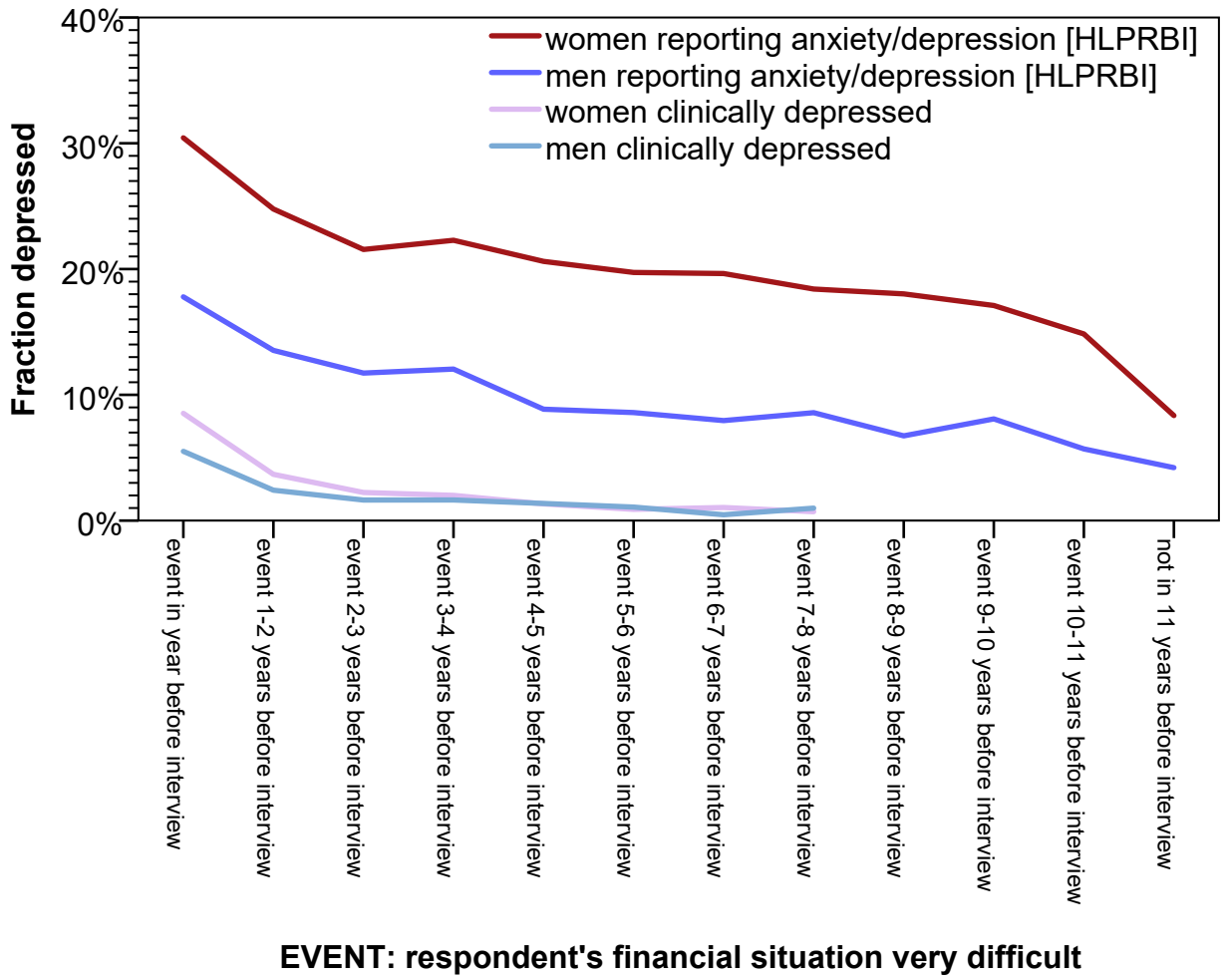
3. Results

3.1 Long-term depression caused by financial stress: Many researchers report links between poverty and depression (Economou et al., 2016; Elliott, 2016; Ljungqvist et al., 2016), and 'problem' debt (Gathergood, 2012). Netuveli et al. (2008) consider 3 successive waves of BHPS (for each person), when the person experienced one or more adverse events (illness, becoming single, or poverty) in the second of three years they analysed. This paper studies longer-term changes, up to 11 years.

For Figures 1 and 4 in this paper, financial stress is assessed using BHPS variable FISIT: respondent 'finding it very difficult'

is classified as a poverty event, in contrast to any other response (living comfortably; doing alright; just about getting by; finding it quite difficult). We can compare respondents who experienced poverty in the last 12 months (left-hand-side of Figure 1); experienced poverty 1 or more years earlier (centre); or never experienced poverty in the last 11 years (right-hand-side of Figure 1).

Figure 1: depression and clinical depression, by gender and financial situation



In Figure 1, the left-hand category shows respondents who said (when interviewed) their financial situation was 'very difficult'; the vertical axis shows the fraction who were depressed. Depression measured by variable HLPRBI is assessed by the respondent him/herself; clinical depression is less frequent. We can't assess effects on clinical depression beyond 8 years, because clinical depression is only reported for 'Understanding Society' - not for earlier BHPS waves. BHPS sample-sizes for Figure 1 are 31,039 women & 24,159 men for HLPRBI; 14,262 women & 10,092 men

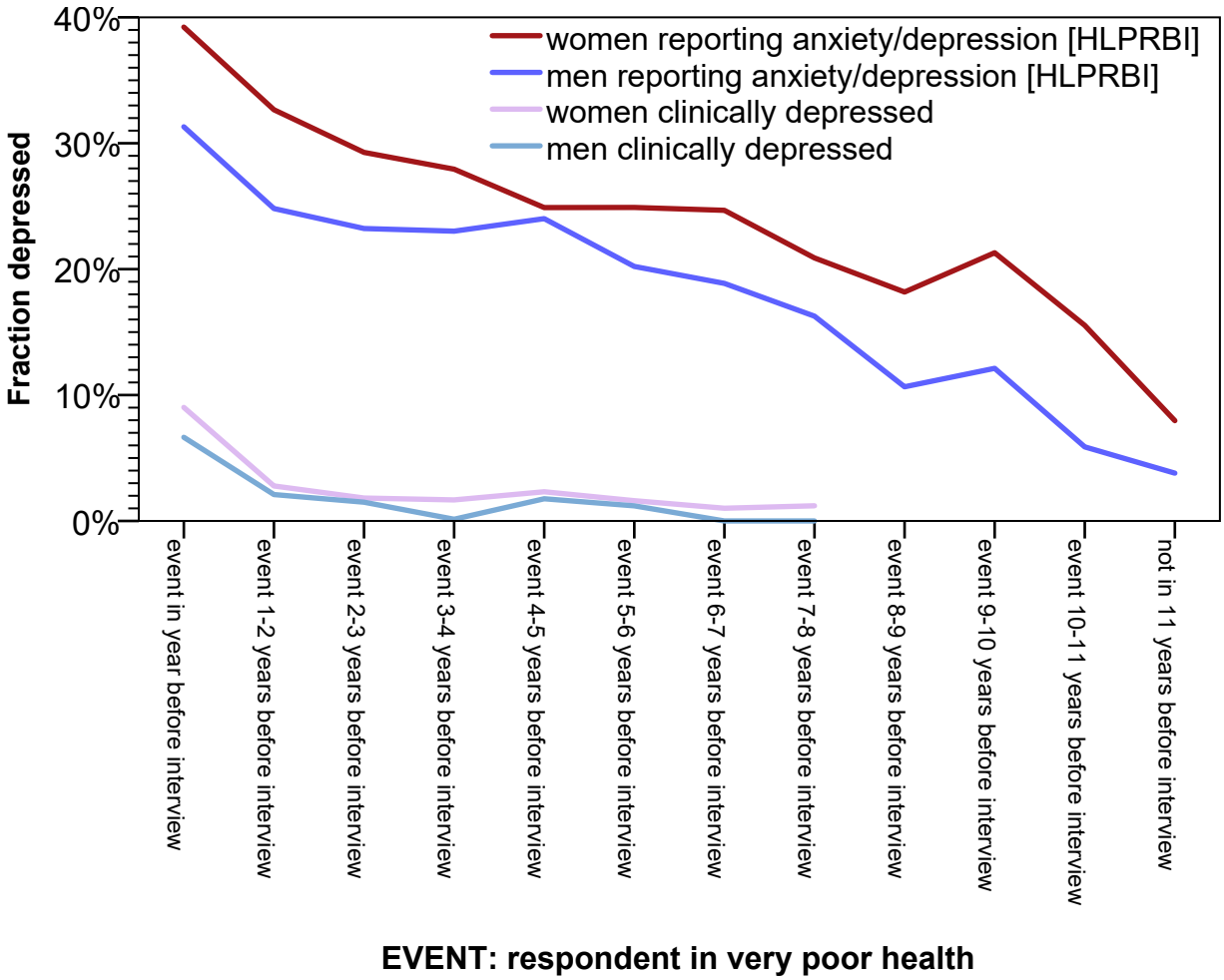
for clinical depression (other Figures in this paper have similar sample-sizes).

All four lines in Figure 1 show the same pattern: depression risk falls from left to right, but only slowly. Solomon et al. (2000) reports that depression can recur; BHPS interviews don't distinguish respondents who are permanently depressed, from respondents who recover but then experience further episodes of depression in later years.

In Figure 1, the fraction of women reporting depression (variable HLPRBI) fell from 30.4% (finances very difficult in year before interview) to 24.8% (finances very difficult 1-2 years before interview); 24.8/30.4 implies a 19% recovery rate. The male equivalent is 13.5/17.8 implying a 24% recovery rate. We can compare this with Netuveli et al. (2008), who studied respondents over 50: less than 15% of those exposed to stressful events recovered in 1 year after the incident.

3.2 Long-term depression caused by physical illness: This paper uses respondent's health, based on BHPS question "In general, would you say your health is... excellent, good, fair, poor, or very poor" (Taylor et al., 2010). BHPS then use the following list: mobility; lifting, carrying or moving objects; manual dexterity; continence; hearing; sight; communication or speech problems; memory or ability to concentrate, learn or understand; recognising when you are in physical danger; physical co-ordination; difficulties with own personal care. In Figures 2 and 5, the horizontal axis shows how recently a health problem occurred in which the respondent said they had 'Very poor' health (as opposed to excellent, good, fair, or poor).

Figure 2: depression and clinical depression, by gender and health



Because BHPS is a panel-study, we can process data to use respondent's current mental health (variable HLPRBI; and 'clinical depression', derived by the author from A_HCONDS17 and other Understanding Society variables). Figure 2 is similar to Figure 1, showing slow reduction in depression risk over eleven years. In Figure 2, about 40% of women and 31% of men became depressed if they experienced 'very poor' health when interviewed; the risk of depression is higher in Figure 2 than in Figure 1, when the stress was 'very difficult' finances.

3.3 Long-term depression caused by unemployment: BHPS respondents were asked their job status; for this paper, they are classified as 'unemployed', or 'not unemployed' (self-employed, in paid employment, retired, family care, student, long-term sick/disabled, maternity leave, government training scheme, or 'something else').

Figure 3: depression and clinical depression, by gender and job situation

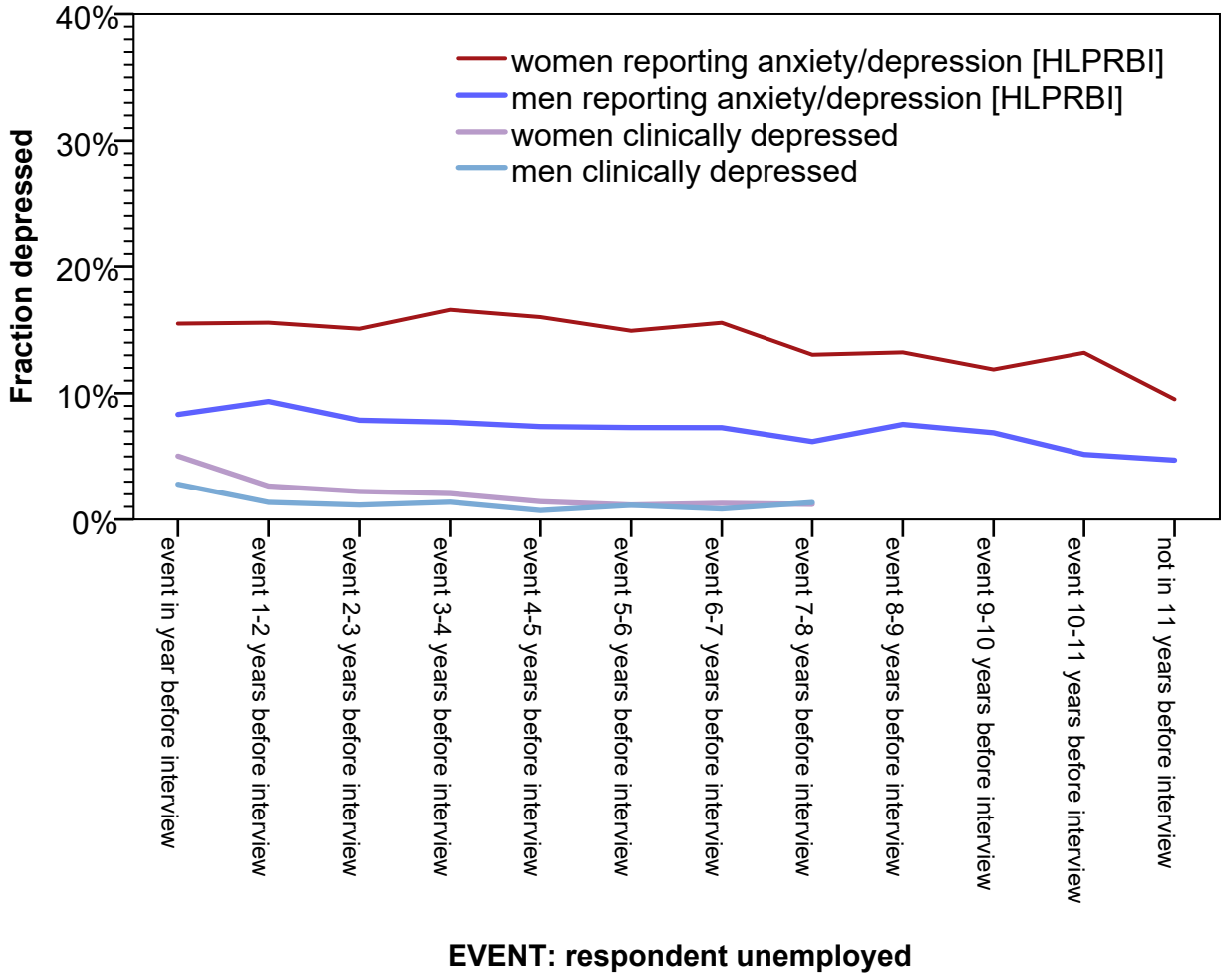


Figure 3 shows the risk of depression slowly falls, after a period of unemployment. This slow reduction is similar to Figures 1 and 2. It is difficult to isolate these events – for example, unemployment might be a result of ill-health, and a cause of poverty.

Figures 1 to 3 shows depression affects more women than men; this confirms previous research (Allen, 2006; Hammen, 2005; Mueller & Leon, 1996). Women may have higher risks partly due to post-natal depression, domestic violence, and rape (Allen, 2006). Hammen (2005) claimed women's increased depression risk is partly because women often have more stressful lives then men – e.g. caring for sick relatives.

3.4 Depression measured by GHQ-12 caused by financial stress: Figures 1 to 3 show slow recovery, from stressful events; GHQ-12 sheds light on this, in Figures 4 to 6. Some researchers convert GHQ values 1 to 4 (see Appendix) into so-called 'Likert'

scale (recoding 1 to zero; 2 to one; 3 to two; and 4 to three); or binary (recoding 1 & 2 to zero, and 3 & 4 to one); or 'modified dichotomous' (recoding 1 to zero, and 2 & 3 & 4 to one) (Montazeri et al., 2003; Smith et al., 2013; Sreeramareddy et al., 2007; Zulkefly & Baharudin, 2010). This paper uses 'Likert' recoding, for the vertical axis in Figures 4 to 6. Figures 4 to 6 use the same horizontal axis as Figures 1 to 3.

Figure 4: GHQ depression following a stressful event: financial difficulties

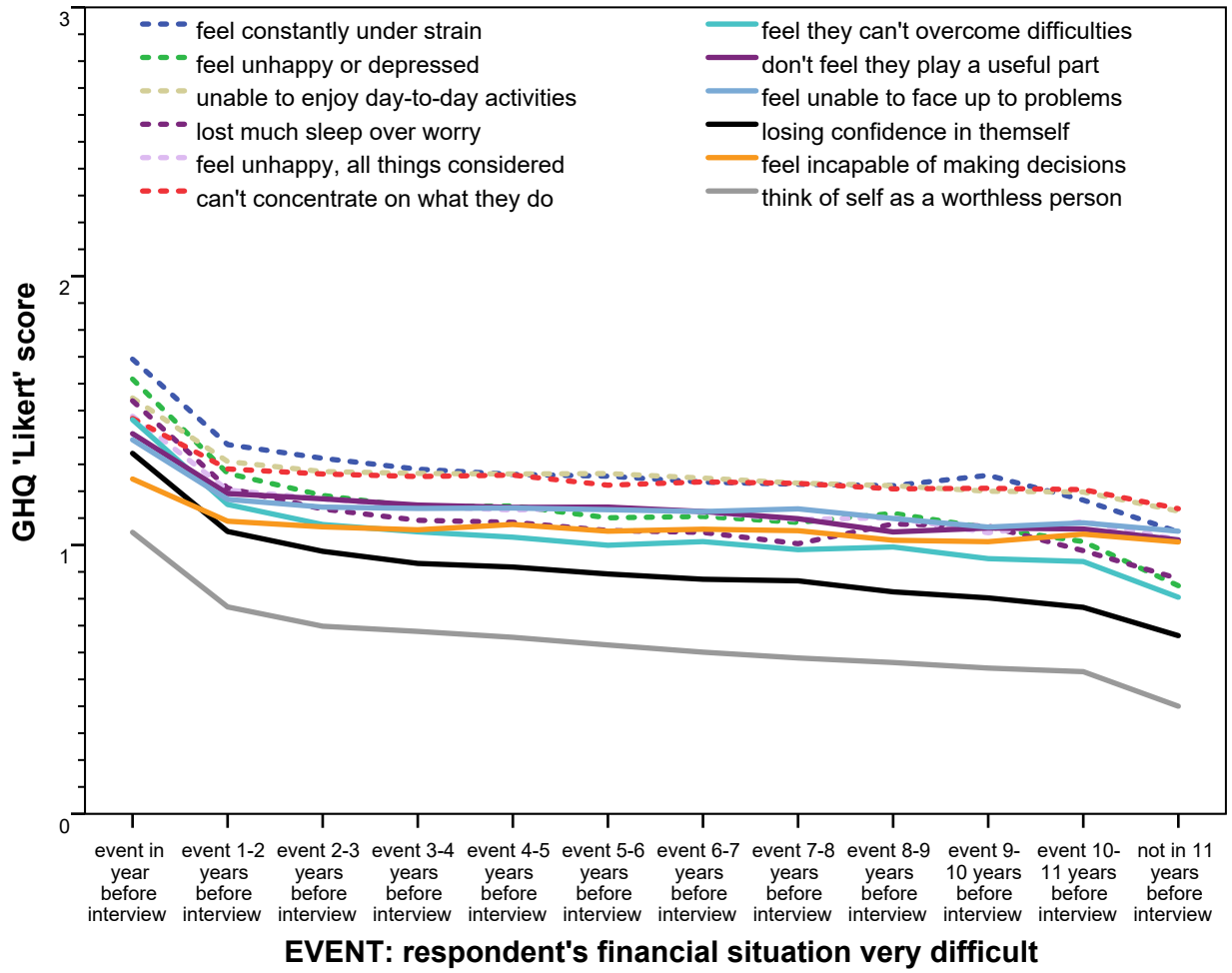


Figure 4 uses the same measure of poverty as Figure 1. Figure 4 shows the risk of depression declines over time, after poverty ends. This pattern is similar to the 10-year chart in Mueller & Leon (1996), which shows a slow & steady decline in depression prevalence. Figure 4 has the same general pattern as Figures 1 to 3: slow declines in apparent depression, from left to right.

To understand slow recovery from depression in Figures 1 to 3, which GHQ variables we should study? In Figure 4, two

variables show the slowest recovery over this period: 'losing confidence', and feeling 'worthless'. It may seem surprising to focus on two lines near the bottom of Figure 4, because the bottom of Figure 4 suggests a smaller problem than the top. But (for example) the solid purple line in Figure 4 measures "don't feel they play a useful part" (question c in the Appendix); this seems less of a problem than "think of self as a worthless person" (question k in the Appendix; grey line in Figure 4).

This paper is not the first to analyse 'feeling worthless' and 'lacking confidence'. Gao et al. (2004) used factor analysis on Singapore hospital data, to investigate GHQ-12; they found three 'factors', one of which (Factor III) comprises GHQ-12 questions 'worthlessness' and 'lacking confidence' – the two lines at the bottom of Figure 4.

3.5 Depression measured by GHQ-12 caused by physical illness: Figure 5 can be compared with Figure 2: both use illness as the 'event' (how recent the event was, is shown on the horizontal axis). Figure 5 uses GHQ-12 variables (rather than depression, in Figure 2).

Figure 5: GHQ depression following a stressful event: health situation

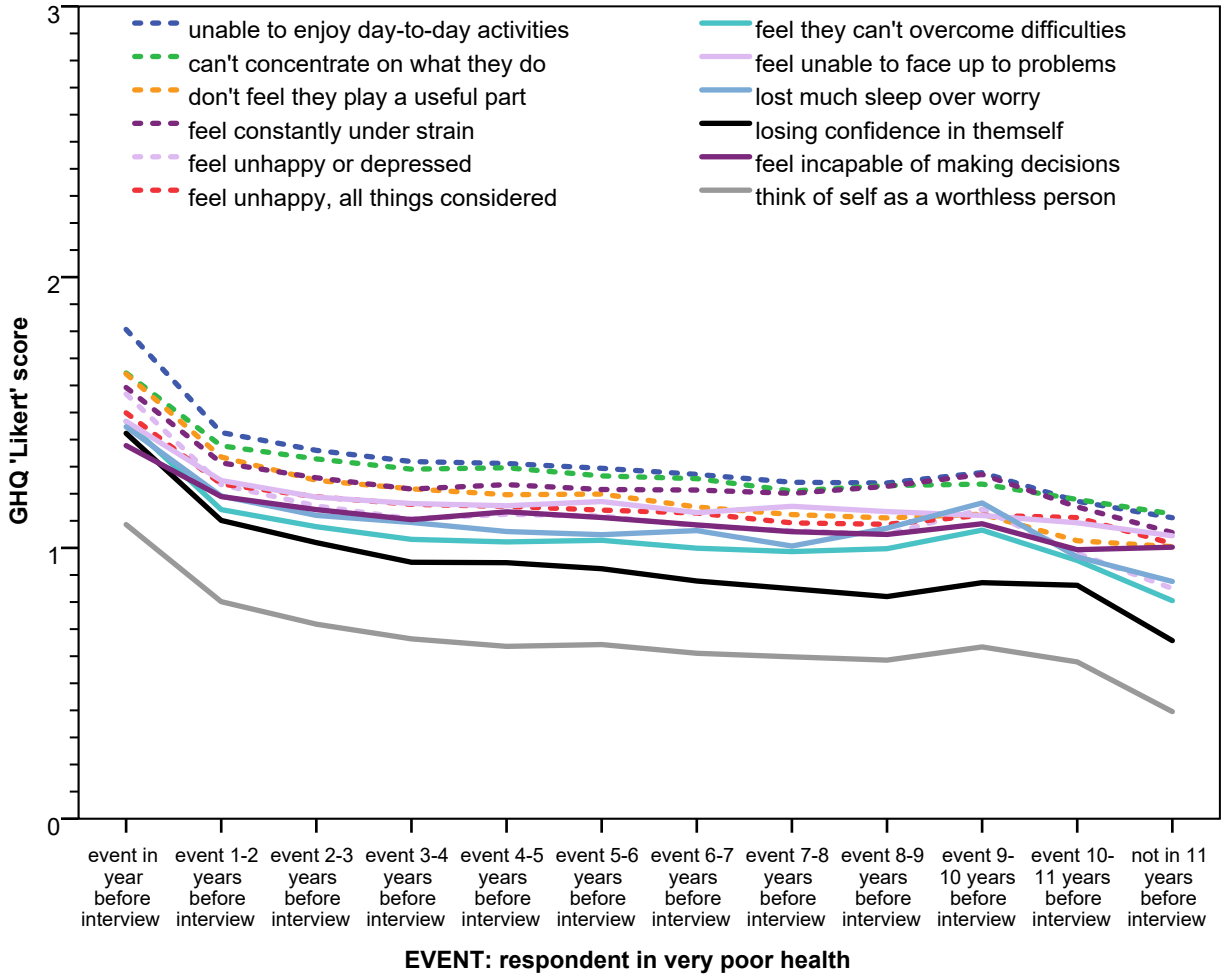
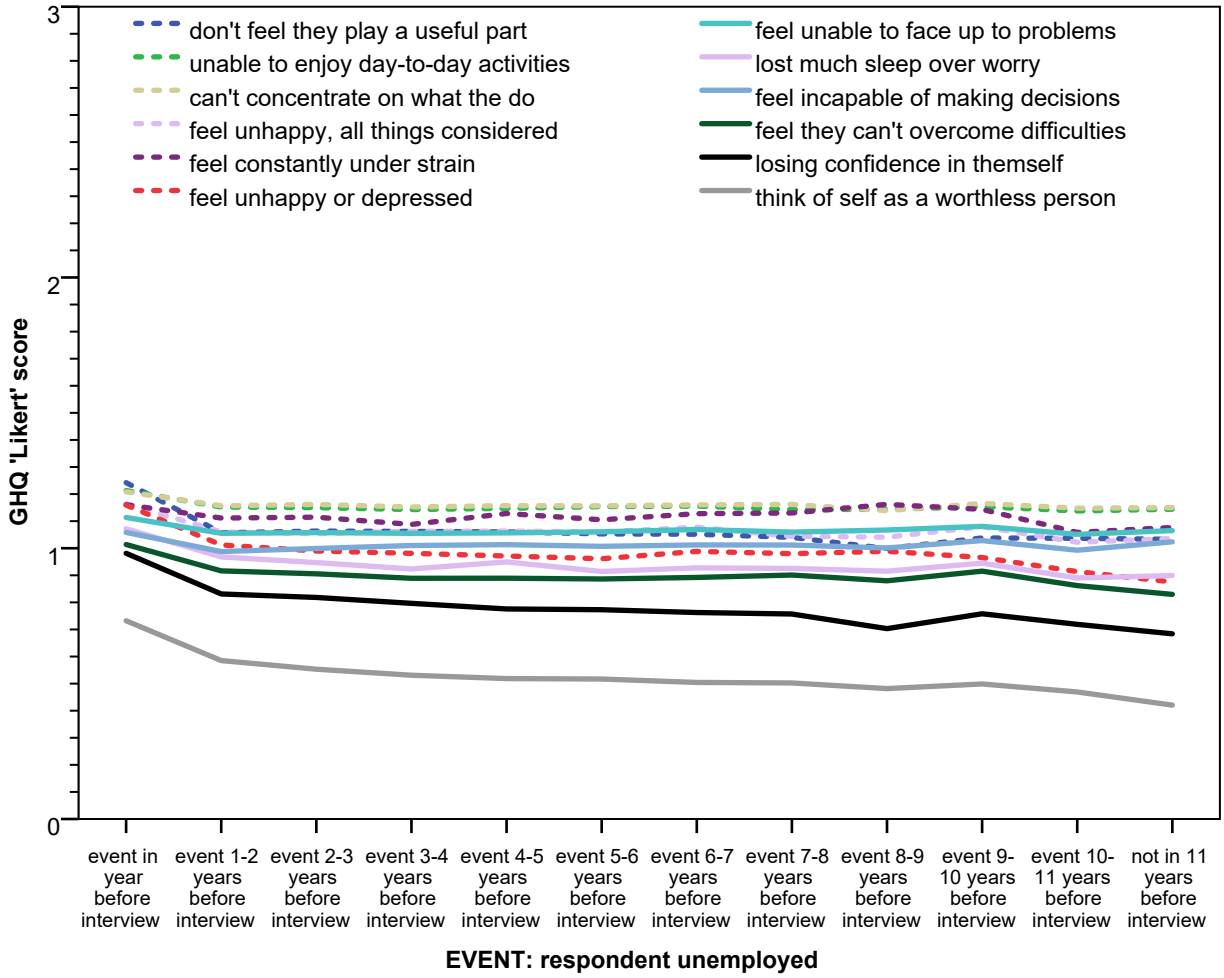


Figure 5 offers a decomposition of the general category "depression" (in Figures 1 to 3). In Figure 5, most of the GHQ-12 variables become approximately horizontal after a year – a fairly quick adjustment; but the grey line at the bottom, feeling 'worthless', declines over a period of about 10 years. Similarly, 'losing confidence' has a steady decline in Figure 5 (from left to right).

3.6 Depression measured by GHQ-12 caused by unemployment: Figure 6 uses the same event as Figure 3. Figure 6 shows fairly small differences between left (unemployed when interviewed) and right (never unemployed, in 11-year period). The lowest (grey) line in Figure 6 fell from 0.7 on the left, to 0.4 on the right: this line refers to respondents feeling 'worthless'. The black line, 'losing confidence', has a similarly slow recovery.

Figure 6: GHQ depression following a stressful event: job situation



3.7 Regression analysis: Tables 1 to 3 report regression analysis on BHPS data, using ARIMA (*1*, *1*, *0*) to control for autocorrelation. The first "*1*" instructs SPSS to add an Autoregressive term to the regression (*AR1* in each Table). A constant is included in each regression; other terms are lagged values of 'difficult finances' (FISIT), coded as 1 ('finding it very difficult') or zero (for other FISIT values); this SPSS syntax is available from the author. In these Tables, * indicates a coefficient statistically significant at the 5% level; ** shows statistical significance at 1%. Each regression combines data from all BHPS waves.

Table 1

	feel constantly under strain	**feel unhappy or depressed**	**unable to enjoy day-to-day activities**	**lost much sleep over worry**
AR1	-0.549**	-0.539**	-0.548**	-0.541**
difficult finances	0.379**	0.396**	0.319**	0.361**
difficult finances Lag 1	0.089**	0.038	-0.017	0.094**
difficult finances Lag 2	0.047	0.028	-0.018	0.037
difficult finances Lag 3	0.111**	0.057	0.028	0.087**
difficult finances Lag 4	0.035	0.027	-0.002	0.029
difficult finances Lag 5	0.074*	0.071*	0.034	0.087**
difficult finances Lag 6	0.068*	0.088**	0.041	0.050
difficult finances Lag 7	0.065*	0.066*	0.022	0.032
difficult finances Lag 8	0.067**	0.080**	0.031	0.058*
difficult finances Lag 9	0.028	0.019	-0.001	0.026
difficult finances Lag 10	0.029	0.007	0.009	-0.001
constant	-0.000002	-0.000005	-0.000003	-0.000009
sample-size	*39,582*	*39,579*	*39,578*	*39,547*

Tables 1 to 3 report regression analysis on each GHQ-12 variable in Figure 4; Table 1 reports the four variables nearest the top of Figure 4. In Table 1, immediate (unlagged) effects of 'difficult finances' are positive and statistically significant: e.g. coefficient 0.379 in the 'under strain' column. This implies the risk of feeling 'under strain' is higher, if the respondent is currently poor. Delayed effects are less clear – two of the four regressions have significant coefficients at Lag 1 (implying strain and sleep-loss are problems a year after financial difficulties); effects after more than 1 year's delay are less clear (most coefficients after lag 1 aren't statistically significant), but there seems some increase in depression around 5 to 8 years after the financial stress. Table 1 is consistent with Figure 4 (the top four lines initially fall, then become approximately horizontal).

Table 2

	feel unhappy, all things considered	**cannot concentrate on what they do**	**cannot overcome difficulties**	**don't feel they play a useful part**
AR1	-0.551**	-0.564**	-0.547**	-0.548**
difficult finances	0.353**	0.297**	0.380**	0.264**
difficult finances Lag 1	-0.049	-0.029	0.071*	0.033
difficult finances Lag 2	-0.006	0.010	0.013	0.017
difficult finances Lag 3	0.050	0.042	0.091**	0.041
difficult finances Lag 4	0.020	0.005	0.029	-0.009
difficult finances Lag 5	0.025	0.028	0.062*	0.033
difficult finances Lag 6	0.018	-0.007	0.074**	-0.003
difficult finances Lag 7	0.034	0.025	0.060*	0.059**
difficult finances Lag 8	0.049*	-0.015	0.121**	0.033
difficult finances Lag 9	0.027	0.010	0.003	0.003
difficult finances Lag 10	0.024	0.029	0.050*	0.013
Constant	-0.000005	-0.000004	-0.000003	0.0000004
sample-size	*39,549*	*39,548*	*39,567*	*39,545*

Table 2, like Table 1, shows positive and statistically-significant coefficients for immediate impacts of GHQ-12 variables. Table 2 shows little evidence of delayed effects: after the first year, respondents have largely recovered from stress caused by financial problems. However, the penultimate column of Table 2, 'cannot overcome difficulties', has positive and statistically-significant coefficients for lags 1, 3, 5 to 8, and 10 (similar to feeling 'under strain', in Table 1).

Regression on the last four variables in Figure 4 are reported in Table 3. The final regression in Table 3, feeling 'worthless', shows long-term effects of financial difficulties (the unlagged coefficients, and lags 1 to 9, are all positive and statistically significant): a person is more likely to feel worthless if they had financial problems, even if it happened 9 years ago (perhaps feeling they failed then, and might fail again). This is consistent with feeling 'worthless' being the steepest line in Figure 4. The penultimate column in Table 3, 'losing confidence', has positive and statistically-significant coefficients at lags 1, 3, 5, and 7; this seems consistent with Figure 4, in that the 'losing confidence' line had a downward slope from left to right. The other two regressions in Table 3 show strong immediate – unlagged – effects of financial problems on mental health; but limited long-term effects.

Table 3

	unable to face up to problems	**losing confidence in self**	**incapable of making decisions**	**think of self as worthless**
AR1	-0.562**	-0.540**	-0.557**	-0.533**
difficult finances	0.259**	0.323**	0.237**	0.307**
difficult finances Lag 1	-0.010	0.058*	-0.004	0.067*
difficult finances Lag 2	-0.014	0.039	-0.022	0.073**
difficult finances Lag 3	0.020	0.098**	0.029	0.115**
difficult finances Lag 4	-0.003	0.029	0.011	0.069**
difficult finances Lag 5	0.026	0.069*	0.033	0.058*
difficult finances Lag 6	-0.034	0.039	-0.048*	0.066**
difficult finances Lag 7	0.037	0.072**	0.014	0.078**
difficult finances Lag 8	0.038*	0.025	0.017	0.047*
difficult finances Lag 9	0.001	0.032	-0.013	0.042*
difficult finances Lag 10	0.021	-0.003	0.006	0.017
constant	-0.000003	-0.000011	-0.000004	-0.000011
sample-size	*39,580*	*39,561*	*39,540*	*39,552*

Tables 1 to 3 can be compared to Figure 4; they show that among GHQ-12 questions, feeling 'worthless' is the most long-lived effect of a financial crisis. This paper does not report regression comparable to other Figures in this paper.

4. Discussion

4.1 Does it take years to recover from depression?: Some academic papers (e.g. Simister, 2019) suggest a 'battle' between two groups of medical professionals. One side (including many psychiatrists) advocate medication to treat depression; expect medication to work within weeks; and dismiss non-medical 'talking cures' as ineffective. On the other side, counselling advocates (including many psychologists) often claim anti-depressants don't work; depression can last for years; and recommend treatments such as CBT. Figures in this paper, and in Mueller & Leon (1996), support the latter view: among victims of stressful events, depression declines slowly over several years. However, there are reasons to reject this over-simplified 'battle' interpretation:

- Many depressed people don't consult a doctor; and some doctors prescribe counselling approaches such as CBT. In such cases, anti-depressants didn't fail: they weren't tried.
- If CBT were a guaranteed cure for depression, and medicines never worked, this would be clear in previous research. Previous evidence doesn't support such a simple picture.

- Figures in this paper show steady reduction in depression risk. But apparently smoothly-sloping lines should not be interpreted as each victim feeling slightly better each month: variable HLPRBI (Figures 1 to 3) is zero or one. We observe a reducing risk of depression; each depressed patient may experience periods of relapse & remission (Allen, 2006).

4.2 Some causes of depression: There are similarities between this paper and Gathergood (2012): both analyse BPHS data, use GHQ data to assess mental health, and find poverty/debt causes depression. Gathergood (2012) included a 1-year delay; but this paper considers up to 11 years' delay. Evidence in this paper suggests that among people who experience a stressful life-event, followed by several years without this life-event recurring, depression risk gradually declines.

Among GHQ-12 questions, the slowest to recover is 'feeling worthless'; the second-slowest GHQ-12 question is 'losing confidence'. These results confirm the general claim by Gao et al. (2004), that each GHQ variable could provide insights – rather than combining them into one GHQ-12 (caseness) measure.

4.3 Depression is not inevitable: In every person's life, events happen – some cause happiness, others cause depression. Recovery from depression tends to be slower if the current depression episode is long or intense; if it coincides with other medical problems; if it is associated with substance abuse or anxiety; if social support is lacking; and if stressful events continue (Allen, 2006).

If someone experiences an unpleasant event such as bereavement, should (government or private) money be spent on counselling techniques such as CBT, or anti-depressant medication? There is evidence that counselling and anti-depressant medicines help (e.g. Harmer et al., 2009; Iacoviello et al., 2014; Iddon & Grant, 2013; Vittengl et al., 2014). Evidence in this paper shows that treatment for depression is often appropriate. Depression can be long-lasting; if we don't help depressed people, some may feel 'worthless' for 9 or more years.

References:

Allen J.G. (2006), *Coping with depression: from catch-22 to hope*, American Psychiatric Publishing Inc, Washington DC. ISBN:1-58562-211-7

Callander E.J. & Schofield D.J. (2015), 'Psychological distress and the increased risk of falling into poverty: a longitudinal study of Australian adults', *Social Psychiatry and Psychiatric Epidemiology* 50(10), 1547-56. https://doi.org/10.1007/s00127-015-1074-6

Economou M., Angelopoulos E., Peppou L.E., Souliotis K., Tzavara C., Kontoangelos K., Madianos M. & Stefanis C. (2016), 'Enduring financial crisis in Greece: prevalence and correlates of major depression and suicidality', *Social Psychiatry and Psychiatric Epidemiology* 51(7), 1015-24. https://doi.org/10.1007/s00127-016-1238-z

Elliott I. (2016) 'Poverty and Mental Health: A review to inform the Joseph Rowntree Foundation's Anti-Poverty Strategy'. London: Mental Health Foundation. https://www.mentalhealth.org.uk/sites/default/files/Poverty%20and%20Mental%20Health.pdf downloaded 6th November 2016.

Gao F., Luo N., Thumboo J., Fones C., Li S.-C. & Cheung Y.B. (2004), 'Does the 12-item General Health Questionnaire contain multiple factors and do we need them?', *Health and Quality of Life Outcomes* 2(1), 63-9. https://doi.org/10.1186/1477-7525-2-63

Gathergood J. (2012), 'Debt and depression: causal links and social norm effects', *Economic Journal* 122, 1094-1114. https://doi.org/10.1111/j.1468-0297.2012.02519.x

Goldberg D.P., Gater R., Sartorius N., Ustun T.B., Piccinelli M., Gureje O. & Rutter C. (1997), 'The validity of two versions of the GHQ in the WHO study of mental illness in general health care', *Psychological Medicine* 27(1), 191-7. https://doi.org/10.1017/S0033291796004242

Hammen C. (2005), 'Stress and depression', *Annual Review of Clinical Psychology* 1, 293–319. https://doi.org/10.1146/annurev.clinpsy.1.102803.143938

Harmer C.J., Goodwin G.M. & Cowen P.J. (2009), 'Why do antidepressants take so long to work? A cognitive neuropsychological model of antidepressant drug action', *British Journal of Psychiatry* 195(2), 102-8. https://doi.org/10.1192/bjp.bp.108.051193

Hassanzadeh A., Heidari Z., Feizi A., Hassanzadeh Keshteli A., Roohafza H., Afshar H. & Adibi P. (2017), 'Association of stressful life events with psychological problems: A large-scale community-based study using grouped outcomes latent factor regression with latent predictors', *Computational and mathematical methods in medicine*, 3457103. https://doi.org/10.1155/2017/3457103

Holt E.W., Muntner P., Joyce C., Morisky D.E., Webber L.S. & Krousel-Wood M. (2012). Life events, coping, and antihypertensive medication adherence among older adults: the cohort study of medication adherence among older adults. *American Journal of Epidemiology*, 176 (Supplement 7), S64-71. https://doi.org/10.1093/aje/kws233

Iacoviello B.M., Wu G., Alvarez E., Huryk K., Collins K. A., Murrough J.W., Iosifescu D.V. & Charney D.S. (2014), 'Cognitive-emotional training as an intervention for major depressive disorder', *Depression & Anxiety* 31, 699-706. https://doi.org/10.1002/da.22266

Iddon J. & Grant L. (2013), 'Behavioural and Cognitive Treatment Interventions in Depression: An analysis of the Evidence Base', *Open Journal of Depression* 2(2), 11-15. https://doi.org/10.4236/ojd.2013.22003

Kinderman P., Schwannauer M., Pontin E. & Tai S. (2013), 'Psychological processes mediate the impact of familial risk, social circumstances and life events on mental health'. *PLoS ONE* 8(10), e76564. https://doi.org/10.1371/journal.pone.0076564

Ljungqvist I., Topor A., Forssell H., Svensson I. & Davidson L. (2016), 'Money and mental illness: a study of the

relationship between poverty and serious psychological problems', *Community Mental Health Journal* 52(7), 842-50. https://doi.org/10.1007/s10597-015-9950-9

Meltzer H., Bebbington P., Brugha T., Farrell M. & Jenkins R. (2012), 'The relationship between personal debt and specific common mental disorders', *European Journal of Public Health* 23(1), 108-13. https://doi.org/10.1093/eurpub/cks021

Moffitt T.E., Harrington H., Caspi A., Kim-Cohen J., Goldberg D., Gregory A.M. & Poulton R. (2007), 'Depression and Generalized Anxiety Disorder: cumulative and sequential comorbidity in a birth cohort followed prospectively to age 32 years', *Archives of General Psychiatry* 64(6), 651-60. https://doi.org/10.1001/archpsyc.64.6.651

Montazeri A., Harirchi A.M., Shariati M., Garmaroudi G., Ebadi M. & Fateh A. (2003), 'The 12-item General Health Questionnaire (GHQ-12): translation and validation study of the Iranian version', *Health and quality of life outcomes* 1, 66-69. https://doi.org/10.1186/1477-7525-1-66

Mueller T.I. & Leon A.C. (1996), 'Recovery, chronicity, and levels of psychopathology in major depression', *Psychiatric Clinics of North America* 19(1), 85-102. https://doi.org/10.1016/S0193-953X(05)70275-6

Netuveli G., Wiggins R.D., Montgomery S.M., Hildon Z. & Blane D. (2008), 'Mental health and resilience at older ages: bouncing back after adversity in the British Household Panel Survey', *Journal of Epidemiology and Community Health* 62(11), 987-91. https://dx.doi.org/10.1136/jech.2007.069138

NIMH (2016), 'Discussion', National Institute of Mental Health, https://www.nimh.nih.gov/research-priorities/rdoc/discussion.shtml downloaded 13th November 2016.

Post R.M. (1992), 'Transduction of psychosocial stress into the neurobiology of recurrent affective disorder', *American Journal of Psychiatry* 149, 999–1010. https://doi.org/10.1176/ajp.149.8.999

Roohafza H., Ramezani M., Sadeghi M., Shahnam M., Zolfagari B. & Sarafzadegan N. (2011), 'Development and validation of the stressful life event questionnaire', *International Journal of Public Health* 56(4), 441-8. https://doi.org/10.1007/s00038-011-0232-1

Røysamb E., Kendler K.S., Tambs K., Orstavik R.E., Neale M.C., Aggen S.H., Torgersen S. & Reichborn-Kjennerud T. (2011), 'The joint structure of DSM-IV Axis I and Axis II disorders', *Journal of Abnormal Psychology* 120(1), 198-209. https://doi.org/10.1037/a0021660

Sheldon B. (2011), 'Cognitive-Behavioural Therapy: research and practice in health and social care', second edition, Routledge: Abingdon. https://doi.org/10.4324/9780203833711

Simister J. (2019) 'Are doctors getting the balance right? Treatment for depression in England, 1983 to 2017', MOJ Womens Health 8(1), 78-84. https://medcraveonline.com/MOJWH/MOJWH-08-00216.pdf

Smith A.B., Oluboyede Y., West R., Hewison J. & House A.O. (2013), 'The factor structure of the GHQ-12: the interaction between item phrasing,

variance and levels of distress', *Quality of Life Research* 22(1), 145-52. https://doi.org/10.1007/s11136-012-0133-7

Solomon D.A., Keller M.B., Leon A.C., Mueller T.I., Lavori M.W., Shea M.T., Coryell W., Warshaw M., Turvey C., Maser J.D. & Endicott J. (2000), 'Multiple Recurrences of Major Depressive Disorder', *American Journal of Psychiatry* 157(2), 229-233. https://ajp.psychiatryonline.org/doi/10.1176/appi.ajp.157.2.229

Sreeramareddy C.T., Shankar P.R., Binu V.S., Mukhopadhyay C., Ray B. & Menezes R.G. (2007), 'Psychological morbidity, sources of stress and coping strategies among undergraduate medical students of Nepal', *BMC Medical Education* 7(1), 26-35. https://doi.org/10.1186/1472-6920-7-26

Swindle R.W., Cronkite R.C. & Moos R.H. (1989). 'Life stressors, social resources, coping, and the 4-year course of unipolar depression'. *Journal of Abnormal Psychology* 98(4), 468-477. http://dx.doi.org/10.1037/0021-843X.98.4.468

Taylor M.F. (editor) with Brice J., Buck N. & Prentice-Lane E. (2010), British Household Panel Survey, user manual Volume A: introduction, technical report and appendices. Colchester: University of Essex. ISBN:9781858711770.

Thapar A., Collishaw S., Potter R. & Thapar A.K. (2010), 'Managing and preventing depression in adolescents', *British Medical Journal* 340(7740), 254-258. https://dx.doi.org/10.1136/bmj.c209

Vittengl J.R., Clark L.A., Thase M.E. & Jarrett R.B. (2014). 'Stable remission and recovery after acute-phase cognitive therapy for recurrent major depressive disorder'. *Journal of consulting and clinical psychology* 82(6), 1049-1059. https://dx.doi.org/10.1037/a0037401

Wethington E. (2016), 'Life Events Scale', Chapter 12 in Fink G. (ed.), *Stress: concepts, cognition, emotion, and behavior: Handbook of Stress series Volume 1*, Elsevier. https://doi.org/10.1016/C2013-0-12842-5

WHO (2015), 'International Statistical Classification of Diseases and Related Health Problems 10th Revision', World Health Organization, http://apps.who.int/classifications/icd10/browse/2015/en downloaded 12th November 2016.

Woody M.L. & Gibb B.E. (2015), 'Integrating NIMH Research Domain Criteria (RDoC) into depression research', *Current Opinion in Psychology* 4, 6-12. https://doi.org/10.1016/j.copsyc.2015.01.004

Zulkefly N.S. & Baharudin R. (2010) 'Using the 12-item General Health Questionnaire (GHQ-12) to assess the psychological health of Malaysian college students', *Global Journal of Health Science* 2(1), 73-80. https://doi.org/10.5539/gjhs.v2n1p73

Appendix: General Health Questionnaire

Each BHPS self-completion questionnaire includes these GHQ-12 questions (Taylor, 2010, pp.140-2): "Here are some questions regarding the way you have been feeling over the last few weeks. For each question please ring the number next to the answer that best suits the way you have felt. Have you recently...."

a) been able to concentrate on whatever you're doing?
   1 Better than usual 2 Same as usual 3 Less than usual 4 Much less than usual.

b) lost much sleep over worry?
   1 Not at all 2 No more than usual 3 Rather more than usual 4 Much more than usual

c) felt that you were playing a useful part in things?
   1 More than usual 2 Same as usual 3 Less so than usual 4 Much less than usual

d) felt capable of making decisions about things?
   1 More so than usual 2 Same as usual 3 Less so than usual 4 Much less capable

e) felt constantly under strain?
   1 Not at all 2 No more than usual 3 Rather more than usual 4 Much more than usual

f) felt you couldn't overcome your difficulties?
   1 Not at all 2 No more than usual 3 Rather more than usual 4 Much more than usual

g) been able to enjoy your normal day-to-day activities?
   1 More so than usual 2 Same as usual 3 Less so than usual 4 Much less than usual

h) been able to face up to problems?
   1 More so than usual 2 Same as usual 3 Less able than usual 4 Much less able

i) been feeling unhappy or depressed?
   1 Not at all 2 No more than usual 3 Rather more than usual 4 Much more than usual

j) been losing confidence in yourself?
   1 Not at all 2 Not more than usual 3 Rather more than usual 4 Much more than usual

k) been thinking of yourself as a worthless person?
   1 Not at all 2 No more than usual 3 Rather more than usual 4 Much more than usual

l) been feeling reasonably happy, all things considered?
   1 More so than usual 2 About same as usual 3 Less so than usual 4 Much less than usual