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Unhappiness and age

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ABSTRACT

I examine the relationship between unhappiness and age using data from eight well-being data files on nearly 14 million respondents across forty European countries and the United States and 168 countries from the Gallup World Poll. I use twenty different individual characterizations of unhappiness including *many not good mental health days; anxiety; worry; loneliness; sadness; stress; pain; strain, depression and bad nerves; phobias and panic; being downhearted; having restless sleep; losing confidence in oneself; not being able to overcome difficulties; being under strain; being unhappy; feeling a failure; feeling left out; feeling tense; and thinking of yourself as a worthless person*. I also analyze responses to a further general attitudinal measure regarding whether the situation in the respondent's country is *getting worse*. Responses to all these unhappiness questions show a, ceteris paribus, hill shape in age, with controls and many also do so with limited controls for time and country. Unhappiness is hill-shaped in age and the average age where the maximum occurs is 49 with or without controls. There is an unhappiness curve.

I document hump or hill shapes in age in various measures of unhappiness in many countries including the United States and the United Kingdom. There is no standard way to measure unhappiness, so I experiment with a series of alternatives. Most exhibit these profiles without the inclusion of controls other than for time and country or region, and all do so with controls for gender, education, marital and labor force status. I find that this hill shape in age in unhappiness, reveals itself in twenty-one different characterizations of unhappiness taken from over fourteen million respondents in eight surveys conducted in forty European countries[1] and the United States and a sample of 168 countries from around the world using the Gallup World Poll. Some of these outcomes are found in more than one dataset e.g. depression, sadness, poor or restless sleep and loneliness.

A referee has sensibly suggested that it would be appropriate to try to group these variables. I place them, somewhat arbitrarily admittedly, into four groups relating to mental health, social interactions, physical and national well-being.

1) Mental Health

1) Many 'not good' mental health days.
2) Depression.
3) Worry.
4) Sadness.
5) Stress.
6) Being under strain.
7) Bad nerves.

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[1] This includes all 28 EU countries plus Albania; Iceland; Israel; Kosovo; Macedonia; Montenegro; Norway; Russia; Serbia; Switzerland; Turkey and Ukraine;

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8) Phobias and panics.
9) Being anxious.
10) Being downhearted.
11) Being unhappy.
2) Social Interactions and Feelings
12) Left out of society
13) Not being able to overcome difficulties.
14) Losing confidence in yourself.
15) Thinking of yourself as a worthless person.
16) Feeling a failure.
17) Loneliness.
18) Feeling tense.
3) Physical well-being
19) Pain.
20) Poor/short sleep.
4) National well-being
21) The situation in the respondent's country is getting worse

The first eleven variables on the list, relate directly to poor mental health that often requires medical treatment including anti-depressants and even hospitalization. Examples are being treated for depression, bad nerves, feeling stressed and tense along with anxiety and worry. Phobias and panics relate to more serious, and rare, forms of mental illness such as schizophrenia. The next seven variables relate to failures in social interactions and feelings with various examples of how people feel left out of society and have difficulty fitting in, or feeling good about themselves, being lonely; having low confidence, not feeling a success; feeling worthless and being unable to overcome difficulties. The third grouping is about physical well-being – having pain and being unable to sleep. Other groupings of course are feasible. The final grouping relates to a broader view of national well-being where individuals report on whether they think the country are going badly.

This paper is complementary to Blanchflower (2020a) that looked at happiness rather than unhappiness data and showed a U-shaped relationship in age, separately in 132 countries, controlling for age, education, marital and labor force status and in many instances without controls other than time dummies.[2] The paper found a U-shape in one hundred and nine developing countries and thirty-six advanced countries. It applied to every EU28 country, every OECD country, to rich and poor countries and to all five continents. The happiness curve was mostly found using happiness and life satisfaction variables, but it was also found using a group of other measures including views on politics and the economy as well as satisfaction with an individual's financial situation, their living standards, the local area where they live and so on. All showed a midlife dip with a minimum around age 50. In this paper I show the mirror image of the U-shape happiness curve (Rauch, 2018). There is a hump or hill shaped unhappiness curve in age. Well-being reaches a zenith in mid-life.

An obvious question is whether unhappiness is simply the inverse of happiness. Huppert and Whittington (2003) warned of the relative independence of positive and negative affect. For example, in their data lack of paid employment was more strongly associated with a reduction in positive feelings than with an increase in psychological symptoms like depression and anxiety. Huppert (2009) asked the question whether drivers of well-being are the same as drivers of ill-being? Huppert concluded that "*some are, and some are not*". Thus, neuroticism, for example, she argues, appears to drive negative mood and common mental disorders, whereas extraversion drives positive emotional characteristics. Serotonin levels have been shown to be related to positive mood but not to negative mood. Huppert concluded that mental well-being and ill-being "*have different biological as well as behavioral effects*" (2009, p.142).

It is true that often the correlation between unhappiness and happiness variables is not high.[3] However, most of the effects found in happiness equations do go through, so the unemployed enter significantly negatively into happiness equations and significantly positive in unhappiness equations, for example. Similarly, being married, having more education and a higher income all lower unhappiness and raise happiness. Scandinavian countries like Denmark and Sweden are the happiest and the least unhappy. East European countries like Bulgaria and Romania rank very low in happiness equations and very high in unhappiness equations.

There is an unresolved puzzle though regarding the impact of gender on well-being. In most instances in this paper a male variable enters significantly negative in almost all of the unhappiness equations reported here. It is never significantly positive. In contrast, the coefficient on a male variable in a happiness equation also tends to be negative and significant, see, for example Blanchflower and Oswald (2004a, 2004b, 2011) and Blanchflower (2009).[4]

It does seem that the finding of U-shapes in happiness equations is widely repeated as hill shapes of various forms in unhappiness equations. Blanchflower and Oswald (2008) examined U-shapes using *happiness* measures but the paper also

[2] The latest update of that paper has now found the U-shape in 145 countries.

[3] For example, in the Gallup US Daily Tracker poll used below the correlation between the stress variable and the Cantril life satisfaction measure is −.1.

[4] As an illustration in the 10-step anxiety equation using the 2016-2018 Annual Population Survey data for the UK used in Table 11 the coefficient on the male variable with limited controls is −.385 (t = 35) and with controls it is −.303 (t = 24). The file also includes a 10-step life satisfaction variable and when it is used as the dependent variable with the same limited controls the male coefficient is −.024 (t = 3.5) and with controls for education, marital and labor force status added it is −.096 (t = 13.1). The same sign for the male coefficient in both a happiness and an unhappiness equation.

explored *unhappiness* and reported a mid-life nadir in well-being using data on depression for the UK from the Labour Force Surveys of 2004Q2-2007Q2 and on mental distress across thirteen EU countries from Eurobarometer #56.1. This data file contained information both on life satisfaction and six elements of the well-known General Health Questionnaire (GHQ6) mental distress score. I return to this file below also and for the first time examine each of the six individual components of the GHQ-6 score and find hump shapes in age for each.

Other papers have examined unhappiness variables and found hill shapes in age. For example, Blanchflower and Oswald (2016) analyzed the use of anti-depressants in randomized samples from 27 European countries in 2010 Eurobarometer data and show that the probability of taking antidepressants also follows hill shaped path that peaked in people's late 40 s. Graham and Pozuelo (2017) analyzed stress using data from the Gallup World Poll from 2005–2014 and found hump shapes in age, including controls for gender, education, marital and employment status and household income in 34 countries.[5] Fortin et al. (2015) using the same Gallup World Poll data also find evidence of a hump-shape in age for stress and also find the same for worry and anger even in the raw data without controls, for men and women separately.

Krueger (2017) found evidence from the American Time Use Survey for 2010, 2012, and 2013 that prime-age men and women age 25–54 were significantly more tired, sad or stressed than was the case for younger or older groups. The differences were especially marked for those not in the labor force. Krueger argued that one factor that likely contributes to the low level of emotional wellbeing of prime age, NLF men is the relatively high amount of time they spend alone. Prime age, NLF men, he found, spent nearly 30 percent of their time alone, compared with 18 percent for prime age, employed men and 17 percent for prime age, employed women.

This paper adds to the growing list of unhappiness variables that contain hill shapes in age. I examine the relationship between unhappiness and age using eight well-being data series with over fourteen million observations. The data sets are 1) the Behavioral Risk Factor Surveillance System (BRFSS) survey of 1993–2019; 2) the Gallup US Daily Tracker Poll, 2008–2017; 3) the Annual Population Survey (APS) for the UK for 2015–2018; 4) the UK Labor Force Survey (LFS) of 2014–2018; 5) the European Social Surveys (ESS) of 2003–2016; 6) the European Quality of Life Surveys (EQLS) of 2003–2016; 7) the Eurobarometer Survey #56.1 for 2001 and 8) the Gallup World Poll of 2005–2018 (GWP). For simplicity I examine these files in aggregate and do not do any analysis at the level of the individual country but as appropriate include country dummies. For the US analysis I always include state dummies and for the UK, region dummies.

It turns out that the relationship between unhappiness and age is broadly similar no matter how the question is asked, or the response scored, the data file used and whether socioeconomic controls are included or not.

1. Background on mental health in midlife

It makes sense to first look at the evidence that exists on a number of dimensions of unhappiness, including depression, pain, mortality, suicide and drug poisonings and their relationship to age.

1.1. Depression

As background it is appropriate to take a brief look at the evidence on depression by age across countries. Depression rates in many advanced countries are higher in mid-life than at other ages. Data from the National Health and Nutrition Examination Survey (NHNES) for the United States 2009–2012, showed that 7.6% of American adults aged 20 and over had depression (moderate or severe depressive symptoms) in a given 2-week period (Pratt and Brody, 2014). Depression rates were 7.4% for those age 18–39; 9.8% for ages 40–59 and 5.4% for those aged sixty and over.

A study of psychiatric morbidity among adults ages 16–74 in the UK in 2000 found that 11% of adults reported depression (Singleton et al., 2003). About one in six adults were found to have a neurotic disorder. The highest prevalence of any neurotic disorder, during the week before interview, was found in the age groups 40–54.

Table 1 reports that the prevalence of chronic depression in the EU28 in 2014, is broadly similar to that of the USA at 7.1% in 2014, although the definition used there is 'chronic depression' and relates to the previous year.[6] For the EU as a whole the highest rate is in the age group 55–64, and that is the age group with the highest incidence for most countries. Exceptions are Denmark (age 35–44) and Luxembourg, Netherlands and Sweden (age 45–54).

1.2. Mortality

Case and Deaton (2020b) documented high mortality rates for white non-Hispanic men and women ages 45–54 in the United States. Death rates for this group they call deaths of despair, that "*are due to drug and alcohol poisoning and suicide, which have disproportionately impacted the middle-aged but especially white non-Hispanic middle-aged.*"

[5] i.e. Albania; Argentina; Australia; Belgium; Bosnia; Brazil; Bulgaria; Canada; Chile; China; Colombia; Croatia; Cyprus; Czech Republic; Estonia; Greece; Hungary; India; Ireland; Latvia; Lithuania; Macedonia; Mexico; Montenegro; Peru; Portugal; Romania; Serbia; Slovakia; South Africa; Spain; UK; USA and Venezuela.

[6] Source: Mental Health and Related Issues Statistics, Eurostat https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Mental_health_and_related_issues_statistics&oldid=390121#Extent_of_depressive_disorders

Table 1
Incidence in 2014 of Chronic Depression in the EU28%.

	Age						
	Total	15–24	25–34	35–44	45–54	55–64	65–74
EU28	7.1	4.0	5.3	5.9	8.3	9.3	7.7
Belgium	6.7	1.0	3.4	6.8	8.8	10.0	7.3
Denmark	8.0	8.3	8.6	9.8	7.4	8.1	5.8
Finland	10.5	10.8	13.5	9.9	9.3	10.1	6.5
France	5.9	2.7	4.2	5.9	7.1	7.7	4.8
Germany	10.6	8.7	9.9	10.0	12.5	13.7	8.1
Hungary	4.9	1.1	2.1	2.6	6.1	8.1	6.9
Ireland	12.1	12.4	10.1	11.0	12.5	17.0	12.3
Luxembourg	9.5	6.6	8.4	9.4	12.4	11.7	6.6
Malta	5.4	2.1	1.8	3.5	6.6	9.8	6.9
Netherlands	7.9	6.1	8.0	8.5	10.0	8.2	5.7
Norway	6.9	5.6	7.5	8.3	6.1	8.7	5.4
Poland	4.2	1.2	2.2	3.0	4.9	6.3	5.7
Sweden	9.6	10.3	13.1	10.0	11.4	9.7	5.2
Turkey	11.0	6.6	9.5	12.1	15.2	13.2	12.7
United Kingdom	8.9	6.7	8.3	8.5	11.3	11.6	7.6

Source: Mental health and related issues statistics, Eurostat.

Novosad and Rafkin (2019) found that high middle-age mortality among non-Hispanic whites have been driven almost entirely the bottom 10% of the education distribution. They show that death rates for the least educated have dramatically diverged from death rates of other groups, in virtually all middle-age race and gender groups. Non-Hispanic whites with the least education have done particularly poorly.

Gaydosh et al. (2019) used National Longitudinal Study of Adolescent to Adult Health found that suicidal ideation, depressive symptoms, marijuana use, and heavy drinking increased as the cohort aged into their late 30 s. They found no evidence that high levels of despair were limited to low educated or to rural areas

The Institute of Health Equity (2020) reported that "*life expectancy in England has stalled, years in ill health have increased and inequalities in health have widened. Among women, particularly, life expectancy declined in the more deprived areas of the country. Some areas, especially in the North, have been ignored left behind, as health has improved elsewhere*." Mortality rates for those aged 45–49 they found were especially high.

There are reasons for concern though given that deaths from overdose, alcohol and suicide are high in many countries outside the United States.[7] The OECD's How's Life? 2020, p107 identified deaths of despair by country, defined as deaths by suicide, acute alcohol abuse or drug poisonings. There are ten countries with higher deaths of despair rates than is found in the United States, in order, Slovenia; Lithuania; Latvia; Korea; Denmark; Belgium; Hungary; Austria; Finland and Poland. Drug overdose rates in 2016 the OECD reported (their Fig. 5.5) were higher in Germany (1/100,000) and Austria (1.1/100,000) than they were in the USA (0.9/100,000). Deaths from acute alcohol abuse were higher in Denmark (10.5), Poland (6.2); Germany (5.3), Austria (4.8) and France (3.5) versus 2.8 in the USA (rates /100,000 population). Deaths of despair do not seem to be a uniquely American problem.

1.3. Pain

Case and Deaton (2015) examined data from the U.S. National Health Interview Survey and found that one in three white non-Hispanics aged 45–54 reported chronic joint pain in the 2011–13 period. They found that the prevalence of pain was highest for those ages 35–54 with less than a high school education. The Institute of Medicine (IOM) reported (2011) a marked rise in pain between 2000 and 2009, especially for those ages 45–64 and for white non-Hispanics.

Case and Deaton (2020b) argue that "*social and community distress, the labor market, politics and corporate interests all collide around pain.*" Case and Deaton (2020a, p83) argue that "*pain has a special place in our narrative. Social and community distress, the labor market, politics and corporate interests all collide around pain, and pain is one of the channels through which each of them affects deaths of despair.*"

Blanchflower and Oswald (2019a) found that Americans were disproportionately likely to report being in pain. Krueger (2017) found that nearly half of prime age men in the United States who are not in the labor force take pain medication on any given day; and in nearly two-thirds of these cases, they take prescription pain medication. According to the National Academies of Sciences, Engineering and Medicine (2017), more than 100 million Americans suffer from chronic pain, which is pain that lasts three months.

[7] See Case and Deaton (2020b). The Institute for Fiscal studies is launching a review of inequalities in the UK led by Sir Angus Deaton, prompted in part by rising deaths of despair and falling life expectancy as well as a slowdown in the decline in deaths from cancer and heart disease, see Joyce and Xu (2019).

Table 2a
OECD Average Suicide Rates by Age, 2015–2016, per 100,000.

	Total	Females	Males
15–19	6.4	3.3	9.4
20–24	10.6	4.2	16.7
25–29	11.6	4.5	18.3
30–34	12.2	5.4	18.8
35–39	13.2	5.6	20.6
40–44	14.8	6.6	23.0
45–49	16.5	7.6	25.6
50–54	18.3	8.5	28.4
55–59	18.2	8.4	28.5
60–64	17.6	8.2	28.0
65–69	15.2	7.6	24.2
70–74	17.3	8.3	29.1
75–79	19.7	9.1	35.4
80–84	21.0	8.7	42.3
85+	23.2	9.9	49.5

Source: Society at a Glance, 2019, OECD Fig. 7.12, p.117.

Carpenter et al. (2017) have found robust evidence that economic downturns lead to increases in the intensity of prescription pain reliever use as well as increases in clinically relevant substance-use disorders involving opioids. These effects are concentrated among working-age white men with low educational attainment.

Despite the widespread use of prescription opioids to treat pain, it seems they are largely ineffective. First, Moore and Hersh (2013, 898) in the Journal of the American Dental Association addressed the treatment of dental pain following wisdom tooth extraction and concluded that 325 mg of acetaminophen taken with 200 mg of ibuprofen provides better pain relief than oral opioids. Second, a review article in the Spine Journal (Lewis et al., 2015) looked at multiple treatment options for sciatica (back pain with a pinched nerve with symptoms radiating down one leg) and found that non-opioid medications provided some positive global effect on the treatment of the disorder, while opioids did not.

In the US Gallup Daily Tracker poll of 2008–2017 discussed in detail below I find that a quarter of Americans in 2018 reported pain 'yesterday'. The weighted probability of reporting pain over the decade rose from 15% for those under twenty; 24% for those 40–49, rising to 30% in the age group 50–69 before declining thereafter. Using the same US Gallup data Case and Deaton (2020b, p.86) show that across counties, the fraction of people reporting pain yesterday "*is strongly associated with suicides and with deaths of despair more generally*"

1.4. Suicide

Burns (2016) reported that in Australia from 2004–2013 for both males and females there were mid-life humps in suicide rates for men and women that maximized at age 40–44 and for women declined thereafter. For women averaged over the period the rate was 7.42 per 100,000 at ages 40–44 and 4.69 at age 85+. For men the 40–44 rate was 25.72 at age 40–44 falling to 15.96 at 65–69 and then rising steadily to 33.44 at age 85+.

Case and Deaton (2017) looked at suicide in the U.S. across three broad age bands 25–34; 35–54 and 55+ and found "*the well- known U-shaped pattern of life evaluation for both men and women; for both sexes, life evaluation is at its lowest in middle age. If suicide rates are to match this, they should peak in middle age. This is true for women, but not for men. The suicide rate for men in 2013 rises with age with no sign of a peak in middle age, at least across these coarse age categories. By contrast, women were more likely to commit suicide in middle age than in youth or in old age, matching the age- pattern in life evaluation*" (p. 311).

Oswald and Tohamy (2017) found a hill-shape in age in female suicides in the United States. The authors found it separately for black and white females in the US in 1980, plus in 2013 as well as in individual country data in the UK, Canada, Belgium, the Netherlands and Sweden in 2013.

More generally across the 1.3 billion people living in the 35 member countries of the OECD there appears to be a mid-life high in suicide rates followed by a fall and then a pick-up in later life. Table 2a reports suicide rates averaged across the OECD by gender showing the mid-life peak for both men and women is in the age group 50–59. Rates then drop through the late sixties but then pick up again through later life. The picture is rather different in some other countries as Table 2b which uses the same OECD data source makes clear for the six main English-speaking countries of Australia; Canada; Ireland; New Zealand; the UK and the USA. All six show rates in middle age which are *higher* than the rates in old age. These English-speaking countries have a peak suicide rate between ages 45 and 54. There is indeed a peak in suicide rates in mid-life.

1.5. Drug poisonings

In the United States drug overdoses resulted in 702,568 deaths during 1999–2017, with 399,230 (56.8%) involving opioids. Drug overdoses resulted in 67,367 deaths in 2018, a decline of 4.1% from 2017 (70,237 deaths) of which 47,600 deaths in-

Table 2b
Suicide Rates by Age. English Speaking Countries.

Age	Australia	Canada	Ireland	New Zealand	UK	USA
15–19	9.8	7.8	4.2	17.6	4.3	10.0
20–24	14.8	11.2	21.7	18.1	7.3	15.3
25–29	15.2	11.7	14.7	11.9	8.2	15.6
30–34	15.7	12.4	14.2	14.4	9.4	15.7
35–39	17.9	13.0	11.5	15.9	9.8	16.6
40–44	19.4	15.8	15.9	14.2	12.3	17.5
45–49	20.8	18.1	16.0	19.6	12.8	19.5
50–54	19.8	18.0	19.4	16.9	11.7	20.9
55–59	15.0	17.4	14.3	15.1	11.7	20.5
60–64	11.7	14.3	6.9	11.2	9.0	17.5
65–69	11.6	11.3	16.1	5.3	7.2	15.6
70–74	12.4	10.7	7.5	9.1	6.4	15.8
75–79	12.5	11.2	4.6	8.2	6.5	17.8
80–84	15.3	13.2	5.3	12.2	7.4	19.0
85+	18.0	13.3	1.5	16.1	8.1	18.7

Source: Society at a Glance, 2019, OECD Fig. 7.12, p. 117.

volved opioids (Hedegaard et al., 2020). The rate of drug overdose deaths involving synthetic opioids other than methadone (drugs such as fentanyl, fentanyl analogs, and tramadol) increased by 10%, from 9.0 in 2017 to 9.9 in 2018.

Lippold et al. (2019) reported that from 2015 to 2017, nearly all racial/ethnic groups and age groups experienced significant increases in opioid-involved and synthetic opioid–involved overdose death rates, particularly blacks aged 45–54 years (from 19.3 to 41.9 per 100,000) and 55–64 years (from 21.8 to 42.7) in large central metro areas. The increased involvement of synthetic opioids in overdose deaths is changing the demographics of the opioid overdose epidemic.

Masters et al. (2018) examined variation in mortality trends from 1980–2014 by gender, age and cause of death, and decompose trends into period- and cohort-based variation. They note that the contributions to rising white mortality rates from suicide and alcohol related deaths have remained stable while the contribution from drug overdoses rose dramatically over the period. They argue that when men and women's mortality rates are analyzed separately "we find little evidence to support the pain- and distress -based narratives forwarded by Case and Deaton'. They conclude that the high mortality rates among younger and middle-aged US White men and women "*have likely been shaped by the US opiate epidemic and an expanding obesogenic environment*".

Hedegaard et al. (2018) report that the rates of drug overdose deaths in 2017 per 100,000 by age group were as follows: 15–24=12.6; 25–34=38.4, 35–44=39.0; 45–54 (37.7) and 55–64 (28.0) and 65+ = 6.9%. Quinones (2015), Kristof and WuDunn (2020) and Arnade (2019) provide helpful insights into the emerging opioid crisis and the difficulties the left-behinds face coping.

In contrast in the European Union Drug report showed that there were around 8200 overdose deaths involving illicit drugs in the European Union in 2017. The UK (34%) and Germany (13%) together account for around a half of the deaths.[8] The ONS reports that there were 4359 deaths due to drug poisonings in England and Wales in 2018, the highest since the series began in 1993.[9]

The published data does suggest a midlife crisis with the United States looking worse than any other country because of the high level of deaths of despair among the prime age. So, I start there.

2. Empirical analysis

There is an issue in the well-being literature on whether it is appropriate to include socioeconomic controls following Glenn (2009) who argued that "*the appearance of this U-shaped curve of well-being is the result of the use of inappropriate and questionable control variables*." Deaton (2018) in addition recently critiqued the use of controls. "*A weightier argument is that many possible and potentially important controls are age dependent, including income and the presence of children but especially health, disability and marital status. If we adjust for these and find, for example, relatively high SWB among the elderly, we have uncovered the not very interesting fact that people in their 70 s would rate their lives highly if they were in prime health, and if their lost friends and spouses were returned to them.*"[10]

[8] The European Drug Report 2017, July 2019 http://www.emcdda.europa.eu/publications/edr/trends-developments/2017/html/harms-responses/overdose-deaths_en

[9] Deaths related to drug poisoning in England and Wales; 2018 registrations', ONS 15th August 2019 https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/deaths/bulletins/deathsrelatedtodrugpoisoninginenglandandwales/2018registrations.

[10] Despite Deaton's (2018) criticism above, a paper in which he was a co-author (Stone, Schwarz, Deaton and Steptoe, 2010) reported U-shapes using the 2008 Gallup World Poll with *and* without controls – for employment, having a partner and/or a child at home - in happiness and enjoyment, with a nadir around 50, a peak in worry and sadness at around 50, and a minimum in life satisfaction at the same age for men and women.

Blanchflower and Oswald (2019b) note that "*it is not natural to see either approach as the 'right' or 'wrong' one*". The reason is that they measure different things. In this paper results are presented both ways, with a 'limited controls' for year and country or state and then 'with controls' for marital and employment status and education. One set of writings has attempted to study raw numbers on well-being and age – a descriptive approach. A second, including Blanchflower and Oswald (2008), has examined the patterns in regression equations for well-being – a ceteris-paribus analytical approach. The latter kind of methods are standard in epidemiology and economics, where the tradition has been to try to understand the consequences of an independent variable (smoking, income, etc.) after adjusting for other influences on the dependent variable.

The descriptive approach measures the 'total', or reduced-form, effect of age. By contrast, the ceteris-paribus analytical approach measures the marginal effect of age after controlling for other socioeconomic influences. For example, as people move from their 20 s to their 50 s, they typically become richer. Say, for illustrative purposes, they also become happier. The descriptive approach would then ascribe the possible rise in their happiness over that period as due to age. The analytical approach would divide the possible rise in happiness into two components – that coming from income per se and any residual effect from aging *per se*. Adding controls is not simply equivalent to finding that those in their 70 s would be happier if they were healthier and their friends were alive. The findings with controls show that the old are happier despite the other things that may have happened as they age, such as losing friends or declining health.

Blanchflower and Oswald (2009) in a response to Glenn showed that in many countries, the U-shape can be found without any control variables. That is what we find here, that the hump or hill shape in unhappiness, or what psychologists call *negative affect*, is clearly seen both with a full set of socioeconomic controls and with limited controls for year and country or region. This is less clear in raw data on happiness in the United States, where there is an early rise in happiness to around age thirty which disappears when controls are included, using life satisfaction in the 2010 BRFSS (Blanchflower and Oswald, 2019b, Fig. 2); happiness in the General Social Survey, 1972–2014 (see Blanchflower and Oswald, 2019b, Fig. 6) and Cantril's life satisfaction ladder from the US Gallup Daily Tracker Poll, 2008–2017 (Blanchflower, 2020a). It seems that the hill shape with limited controls is easier to find than the U-shape is in happiness data with limited controls.

In what follows, after describing the patterns in the raw weighted data I proceed to estimate OLS equations for each of the variables with year and state or country controls that I call 'limited controls'. I then add gender, education and marital status controls, and race for the United States that I classify as 'with controls'. There are three ways I control for age.

1) Age bands that are reported in the tables.
2) Single year of age controls which I then plot in the charts.
3) A quadratic in age, which can then be differentiate with respect to age to solve for a maximum. The maxima are reported for the overall samples at the bottom of the tables.

2.1. Many not good mental health days in the USA, 1993–2019

The question I examine is as follows, along with the sample size in parentheses.

Q1. "Now thinking about your mental health, which includes stress, depression, and problems with emotions, for how many days during the past 30 days was your mental health not good?" (n = 7986,715).[11]

The weighted mean of this variable has risen from 2.9 in 1993 to 3.4 in 2008 and 4.0 in 2018. In response to the question above answers are distributed from zero to thirty.[12] Averaged across these years with sample weights imposed two-thirds of the sample say zero, but 4.9% say thirty out of thirty. Notably the percentage saying that their mental health was not good for at least two thirds of the month has risen from 7.2% in 1993, to 9.7% in 2018. This rise is especially apparent for prime-age less educated whites, who Case and Deaton (2020a, 2020b) have shown have disproportionately experienced deaths of despair. Strikingly, 8.5% of white high school dropouts reported being in this category in 1993 versus 17.8% in 2018. For non-white high school dropouts, the rise is much less striking, from 8.1% to 10.5%. I create a discrete variable in what follows which is set to one if the respondent says 20 or more of the last 30 days were not good mental health days, zero otherwise.

Chart 1 plots the proportion of respondents reporting 20 to 30 not good mental health days in the last thirty days, by single year of age with controls for year, state and gender ('*limited controls*') and then '*with controls*' for marital and labor force status and education. I add the coefficients to the constant and plot so negative values can be ignored as this is just a scalar. There is an early peak in the early twenties when only gender, year and state dummies are included and a trough before a rise to around age 60 and then a decline. With controls the trough in the twenties and thirties is gone. There is now a fairly steep rise through age 25, then a plateau to around fifty, and then a fall thereafter.

Chart 2 is restricted to for those with a high school education and above and has limited controls again. It splits the data into the pre-recession period of 1993–2007 and then the post-recession data from 2008 through 2019. The two hill shapes are similar to the limited control one in Chart 1, but it is clear that the levels are higher with the hill-shape peaking at around 8% in the early period and 12% in the latter. Chart 3 does the same, with limited controls for high school dropouts

[11] The last survey year currently available is 2018 but there are around 18,650, cases for 2019 in the file also, hence why I use 2019 as the end date but refer to the latest estimates using the bigger 2018 data point.

[12] The distribution of this variable is as follows pre 2008 0 days=67.2% (65.4%); 1 day=3.6% (3.4%); 2 days=6.0% (5.3%); 3 days=3.3% (3.3%); 4 days=1.6% (1.6%); 5 days=3.7% (3.9%); 6-20 days=8.1% (8.8%); 20-30 days= 6.5% (9.2%)with the data for 2008-2019 in parentheses.

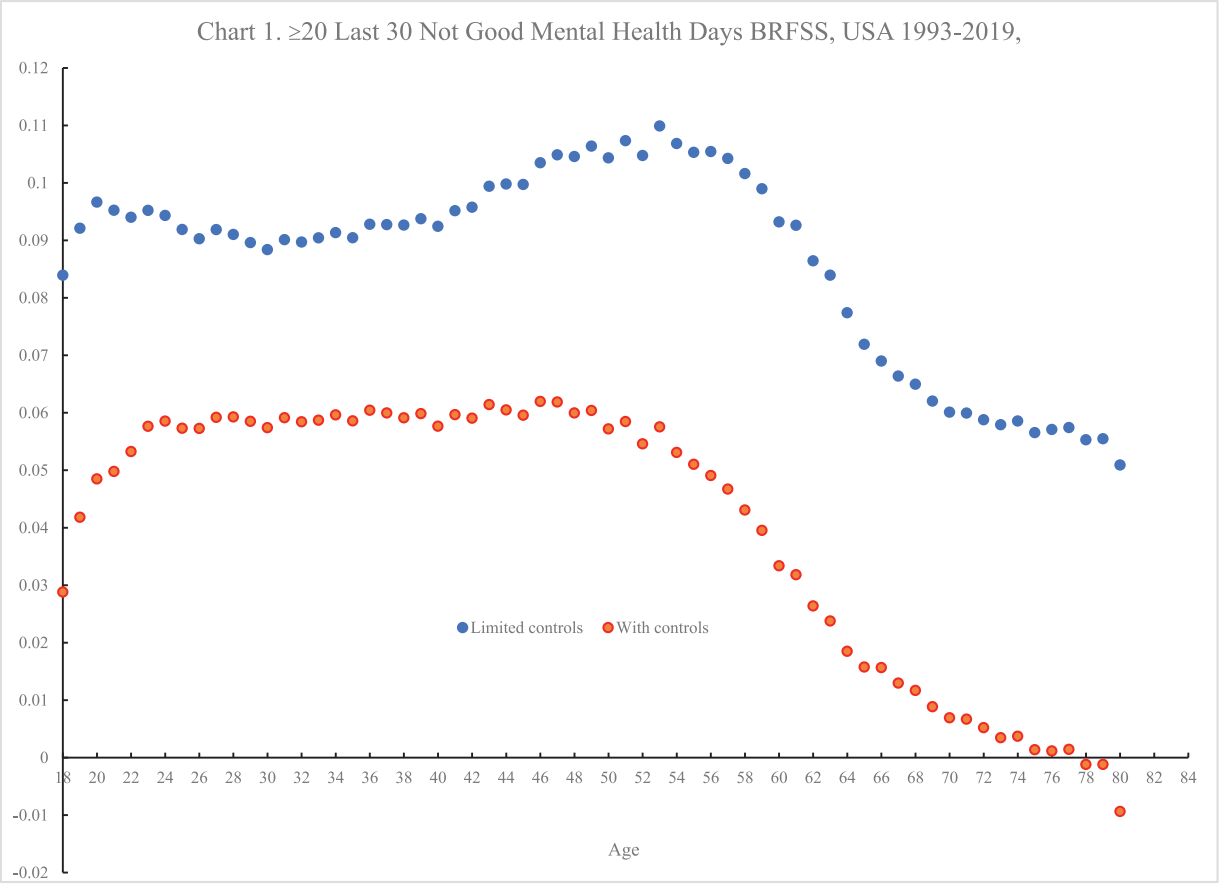

Chart 1. ≥20 Last 30 Not Good Mental Health Days BRFSS, USA 1993–2019.

and there are hump shapes for both but the rise over time is notably marked with the peak going from around 20% to 26%.[13]

Table 3 reports the results of estimating an OLS equation with at least twenty out of thirty not good mental health days as the dependent variable and six age variables that rise steadily through the 50–59 band and then fall back in the first column with limited controls. In the second column when controls for race, education, marital status and employment are added (with controls), the high point is in the forties. In the third column that adds 9 decade of birth cohort dummies the peak is in the age band 40–49. The final two columns of Table 3 for white high school dropouts, split the sample into two periods 1993–2007 in column 4 and 2008–2019. In both cases a peak is reached in the age band 40–49, but with a larger coefficient in the second period (0.075) than in the first (0.054).

2.2. Depression, worry, sadness and pain in the united states, gallup us daily tracker survey, 2008–2017

I have access to the Gallup US Daily Tracker Poll (GUDTP) for the recession years of 2008 and 2009 and its aftermath through 2017 which provides information on around two and half million people on four unhappiness or negative affect variables. The questions used to derive the variables are set out below, along with unweighted sample sizes.

Q2. Depression - Do you currently have, or have you been, treated for depression? (n = 2,632,398).

Q3. Worry - Have you experienced worry yesterday? (n = 2,634,633).

Q4. Sadness - Have you experienced sadness yesterday? (n = 2,474,478).

Q5. Pain - Have you experienced pain yesterday? (n = 2,634,250).

Of note over this time period is that the incidence of sadness (17.7% and 17.5%) and worry (31.5% and 32.0%) remained broadly unchanged between the two end points.[14] In contrast reported pain yesterday increased from 23.2% in 2008 to 27.1% in 2018 while the incidence of depression yesterday rose from 17.1% to 18.5% over these ten years.

[13] In these data 13.3% were high school dropouts in the period 1993-2007 (0.43% never attended; 4.7% 1-8th grade and 8.2% 9th-11th grades). In the later period 13.4% were high school dropouts (0.26% never attended; 4.4% 1-8th grade and 8.75% 9th-11th grades).

[14] These estimates are weighted using the well-being weight *wb_weight*. Sadness was not reported in 2017 so the end point is 2016

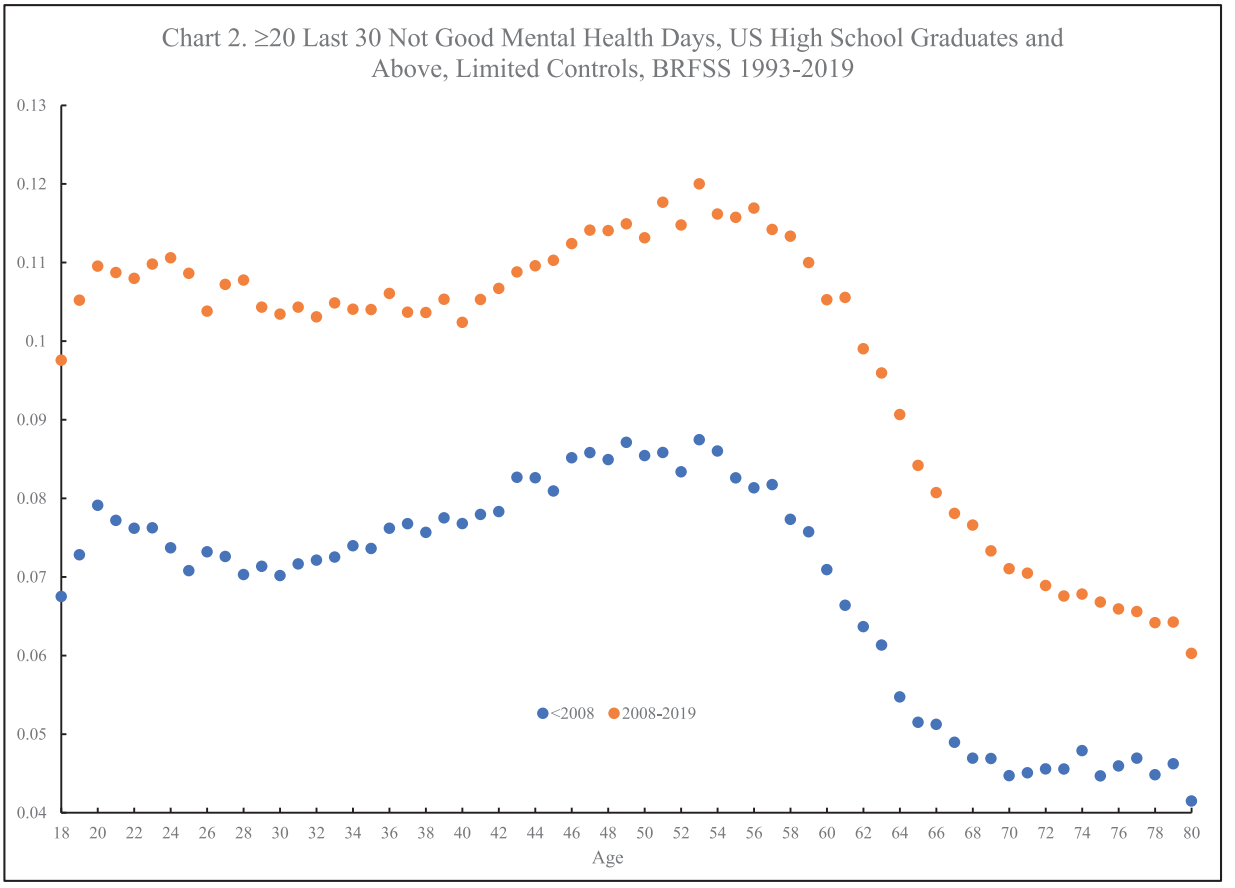

Chart 2. ≥20 Last 30 Not Good Mental Health Days, US High School Graduates and Above, Limited Controls, BRFSS 1993–2019.

Table 3
United States. ≥20 Last 30 Not Good Mental Health Days, BRFSS 1993–2019.

				White High School Dropouts	
				1993–2007	2008–2019
Age 20–29	.0049 (6.04)	.0214 (25.96)	.0249 (29.37)	.0418 (8.16)	0.0602 (9.36)
Age 30–39	.0035 (4.42)	.0242 (28.55)	.0330 (34.57)	.0452 (8.63)	0.0649 (9.99)
Age 40–49	.0125 (15.76)	.0248 (29.10)	.0376 (35.36)	.0537 (10.20)	0.0744 (11.59)
Age 50–59	.0170 (21.59)	.0154 (18.06)	.0322 (27.22)	.0213 (4.02)	0.0488 (7.70)
Age 60–69	−0.0104 (13.16)	−0.0139 (16.00)	.0091 (6.90)	−0.0451 (8.43)	−0.0378 (5.88)
Age 70–80	−0.0323 (40.83)	−0.0139 (16.0)	−0.0022 (1.47)	−0.0682 (12.46)	−0.0878 (13.47)
Male	−0.0238 (125.68)	−0.0178 (92.39)	−0.0177 (91.99)	−0.0270 (17.88)	−0.0362 (22.59)
Labor force dummies	No	Yes	Yes	Yes	Yes
Race dummies	No	Yes	Yes	Yes	Yes
Education dummies	No	Yes	Yes	Yes	Yes
Marital status dummies	No	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes
State dummies	Yes	Yes	Yes	Yes	Yes
Cohort dummies	No	No	Yes	No	No
Constant	.0875	.0456	.0222	.0431	.0699
Adjusted R^2	.0090	.0697	.0698	.1050	.1053
N	7986,714	7980,230	7980,230	215,716	219,586
Maximum	42	35	36		
Mean of dependent variable		7.5%		9.9%	
T-statistics in parentheses.					

Notes: anguish=1 if # not good mental health days >=20, zero otherwise.

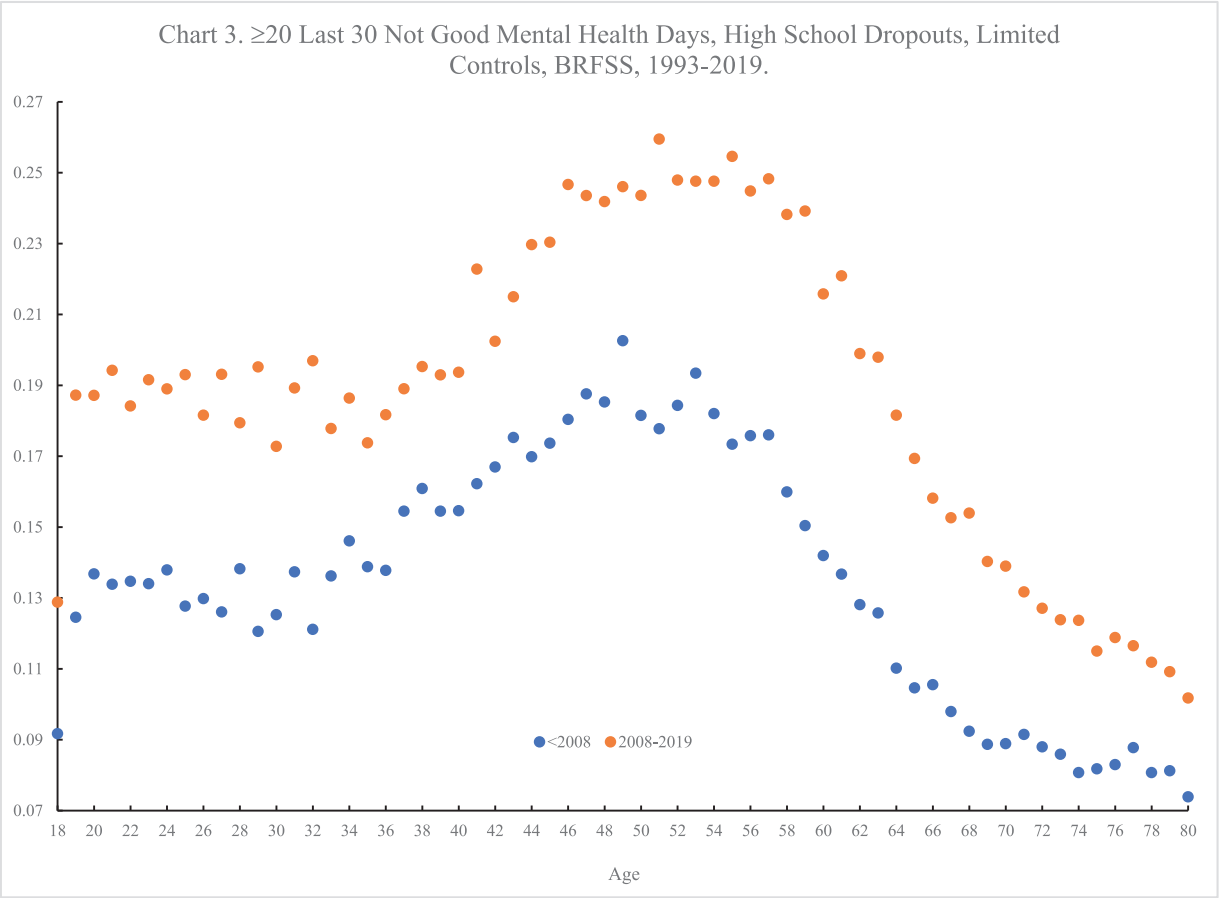

Chart 3. ≥20 Last 30 Not Good Mental Health Days, High School Dropouts, Limited Controls, BRFSS, 1993–2019.

Table 4 reports on the weighted distribution by age for each of these four variables overall and for those with less than a high school education. In all cases the highest incidence is in mid-life. It is notable that the incidence is highest among the least educated and especially so with pain. For high school dropouts (HSD) in the age group 50–59 nearly a half, reported pain yesterday.

Table 5 reports eight OLS regressions for these four variables, with limited controls and with controls. There is a hill-shape in every case with and with limited controls. Charts 4–7 plots single year of age coefficients, added to the constant, with controls and with limited controls for these four variables. They all show well-defined hump shapes with limited or a full set of socioeconomic controls. The least well defined hill shape is for pain with limited controls as suggested in Table 5.

A referee suggested that we also look at income, because of the possibility that it is an obvious variable to explain the hump shape and its inclusion might flatten the hump; it turns out that isn't the case. Income is not available in most of the data files we examined here, but it is available in bands in the GUDTP. I re-estimated the four equations with controls in Table 5 with the age and its square adding in the income variable with the other controls and estimated the age maxima (results not reported). The maxima were essentially unchanged and were as follows, with those from Table 5 in parentheses: depression =47 (46); worry=41 (41); sadness=47 (47) and pain=53 (53).

2.3. Stress and worry, Gallup World Poll, 2005–2019

Various unhappiness measures are available from the Gallup World Tracker poll which have been used in earlier studies including Deaton (2018); Stone et al. (2010); Steptoe et al. (2015) and Graham and Pozuelo (2017). Here I examine stress and worry both of which relate to whether they have been experienced yesterday for the years 2009–2019 in 168 countries.[15] Worry (n = 1,922,606) is as defined above in Q3 and stress is defined similarly in Q6 as.

Q6. Stress - Have you experienced stress yesterday? (n = 1,817,930).

[15] Sample size by year does vary by year, averaging with over 100,000 observations each year from 2007-2018. There are 28,000 observations in 2005, 95,000 in 2006 and 3,000 in 2019

Table 4
Incidence of Depression, Worry, Sadness and Pain by Age in the Gallup US Daily Tracker, 2008–2017%.

	Depression	*Worry*	*Sadness*	*Pain*
Age <20	13	28	16	15
Age 20–29	16	33	16	17
Age 30–39	17	35	17	20
Age 40–49	18	36	19	24
Age 50–59	21	35	21	30
Age 60–69	19	28	18	30
Age 70–79	15	21	16	28
Age >=80	14	19	17	28
Overall	18	32	18	24
N	2591,182	2593,083	2435,132	2592,682
Mean dep vars	.174	.315	.178	.242
White High school dropouts				
	Depression	*Worry*	*Sadness*	*Pain*
Age <20	18	30	17	18
Age 20–29	33	40	26	32
Age 30–39	36	47	29	40
Age 40–49	41	52	37	49
Age 50–59	40	52	37	55
Age 60–69	33	39	30	47
Age 70–79	23	27	22	36
Age >=80	18	21	20	32
Overall	30	38	28	40
N	80,577	80,596	76,377	80,577
Mean dep vars	.303	.382	.276	.401

Notes; weighted wb_*weight*. Sadness not available in 2017.

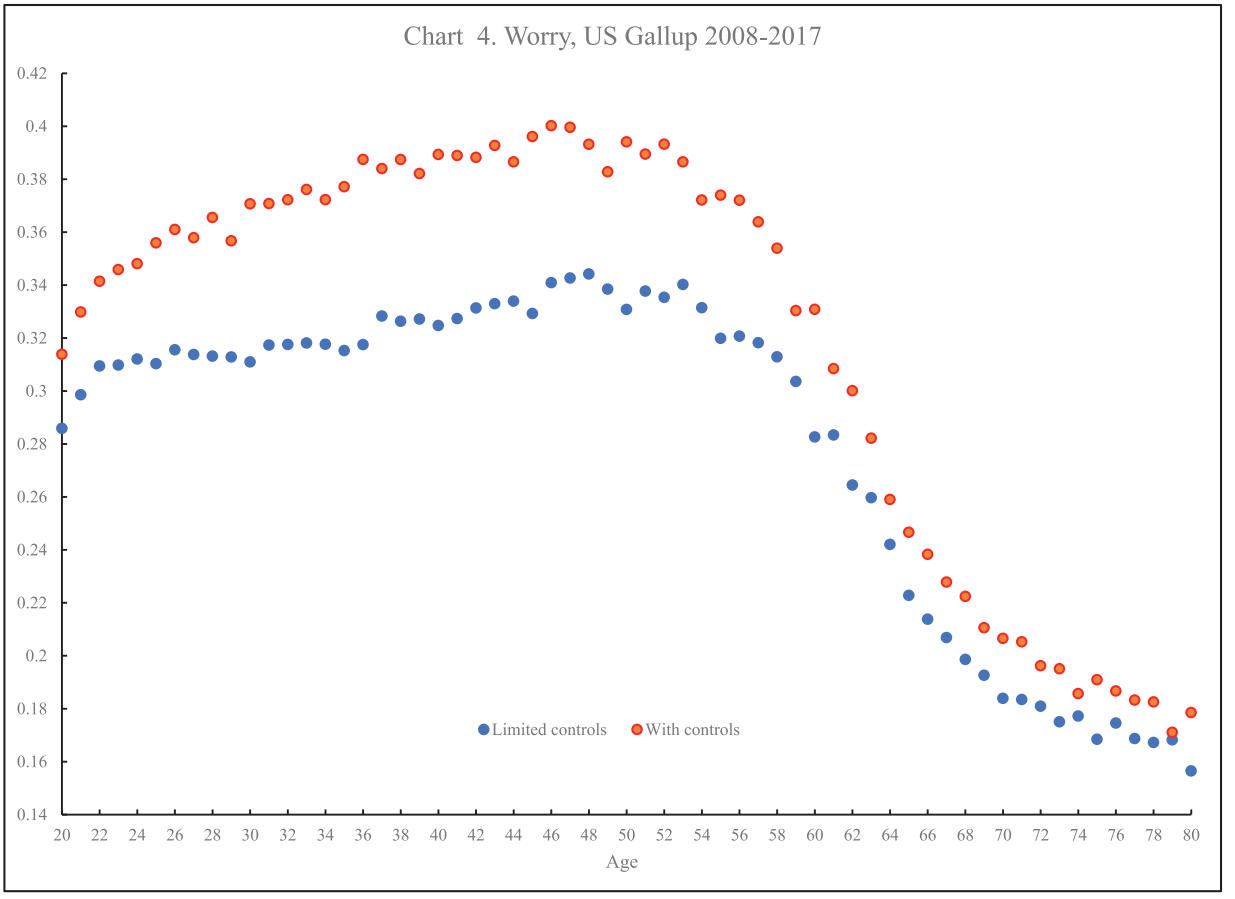

Chart 4. Worry, US Gallup 2008–2017.

Table 5
Depression and Worry in the United States, Gallup Daily Tracker, 2008–2017.

a)	Depression	Depression	Worry	Worry.
Age 20–29	0.0224 (12.63)	.0858 (41.81)	0.0428 (19.80)	0.0824 (32.48)
Age 30–39	0.0256 (14.72)	0.1245 (58.96)	0.0541 (25.38)	0.1171 (44.91)
Age 40–49	0.0382 (22.28)	.1319 (62.70)	0.0692 (33.05)	0.1336 (51.46)
Age 50–59	.0650 (38.54)	.1403 (67.77)	0.0591 (28.69)	0.1195 (46.74)
Age 60–69	0.0488 (28.97)	.0852 (40.89)	−0.0265 (12.89)	.0202 (7.87)
Age 70–79	.0060 (3.49)	.0021 (1.00)	−0.0897 (42.62)	−0.0582 (21.83)
Age >=80	.0171 (9.45)	.0468 (20.23)	−0.1118 (50.35)	.0886 (31.00)
Male	−0.0856 (186.66)	−0.0592 (106.46)	−0.0548 (97.79)	−0.0427 (62.27)
Labor force dummies	No	Yes	No	Yes
Race dummies	No	Yes	No	Yes
Education dummies	No	Yes	No	Yes
Marital status dummies	No	Yes	No	Yes
State dummies	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes
Constant	.1492	.1572	.2670	.2748
Adjusted R^2	.0192	.0674	.0235	.0418
N	2591,179	1813,592	2593,079	1814,824
Maximum	50	46	38	41
b)	Sadness	Sadness	Pain	Pain
Age 20–29	−0.0004 (0.20)	0.0552 (25.11)	.0132 (6.43)	.0823 (36.2)
Age 30–39	−0.0027 (1.50)	.0851 (37.65)	.0320 (15.91)	.1328 (56.7)
Age 40–49	0.0168 (9.35)	0.1051 (46.78)	.0751 (37.89)	.1732 (74.3)
Age 50–59	0.0372 (21.02)	0.1179 (53.30)	.1278 (65.51)	.2106 (92.0)
Age 60–69	.0078 (4.40)	0.0630 (28.32)	.1253 (64.34)	.1608 (69.8)
Age 70–79	−0.0097 (5.36)	0.0104 (4.53)	.1080 (54.26)	.0956 (39.9)
Age >=80	.0017 (0.89)	−0.0069 (2.84)	.1106 (52.65)	.0728 (28.35)
Male	−0.0590 (123.44)	−0.0337 (57.34)	−0.0355 (67.03)	−0.0055 (8.79)
Labor force dummies	No	Yes	No	Yes
Race dummies	No	Yes	No	Yes
Education dummies	No	Yes	No	Yes
Marital status dummies	No	Yes	No	Yes
State dummies	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes
Constant	.1536	.1666	.1742	.1445
Adjusted R^2	.0091	.0439	.0148	.0591
N	2435,128	1657,062	2592,678	1912,503
Maximum	51	47	69	53

T-statistics in parentheses.
Notes: The labor force status variable is only available for 2009–2017 so that is the coverage for the with controls results. Sadness is not available in 2017. Maximum obtained from a separate regression including age and age squared.

The weighted distributions of the proportions reporting stress and worry using the *wgt* weight variable across the pooled sample are as below.[16] Both show a peak in midlife although the drop off is greater for stress than for worry.

	Stress	Worry
Age <20	24	27
Age 20–29	32	35
Age 30–39	35	38
Age 40–49	36	39
Age 50–59	34	40
Age 60–69	28	39
Age 70–79	24	39
Age 80+	24	37
All	32	36

[16] The 168 countries are Afghanistan; Albania; Algeria; Angola; Argentina; Armenia; Australia; Austria; Azerbaijan; Bahrain; Bangladesh; Belarus; Belgium; Belize; Benin; Bhutan; Bolivia; Bosnia Herzegovina; Botswana; Brazil; Bulgaria; Burkina Faso; Burundi; Cambodia; Cameroon; Canada; Central African Republic; Chad; Chile; China; Colombia; Comoros; Congo Brazzaville; Congo Kinshasa; Costa Rica; Croatia; Cuba; Cyprus; Czech Republic; Denmark; Djibouti; Dominican Republic; Ecuador; Egypt; El Salvador; Estonia; Ethiopia; Finland; France; Gabon; Gambia; Georgia; Germany; Ghana; Greece; Guatemala; Guinea; Guyana; Haiti; Honduras; Hong Kong; Hungary; Iceland; India; Indonesia; Iran; Iraq; Ireland; Israel; Italy; Ivory Coast; Jamaica; Japan; Jordan; Kazakhstan; Kenya; Kosovo; Kuwait; Kyrgyzstan; Laos; Latvia; Lebanon; Lesotho; Liberia; Libya; Lithuania; Luxembourg; Macedonia; Madagascar; Malawi; Malaysia; Maldives; Mali; Malta; Mauritania; Mauritius; Mexico; Moldova; Mongolia; Montenegro; Morocco; Mozambique; Myanmar; Nagorno Karabakh; Namibia; Nepal; Netherlands; New Zealand; Nicaragua; Niger; Nigeria; Northern Cyprus; Norway; Oman; Pakistan; Palestine; Panama; Paraguay; Peru; Philippines; Poland; Portugal; Puerto Rico; Qatar; Romania; Russia; Rwanda; Saudi Arabia; Senegal; Serbia; Sierra Leone; Singapore; Slovakia; Slovenia; Somalia; Somaliland; South Africa; South Korea; South Sudan; Spain; Sri Lanka; Sudan; Suriname; Swaziland; Sweden; Switzerland; Syria; Taiwan; Tajikistan; Tanzania; Thailand; Togo; Trinidad and Tobago; Tunisia; Turkey; Turkmenistan; Uganda; Ukraine; UAE; UK; USA; Uruguay; Uzbekistan; Venezuela; Vietnam; Yemen; Zambia and Zimbabwe.

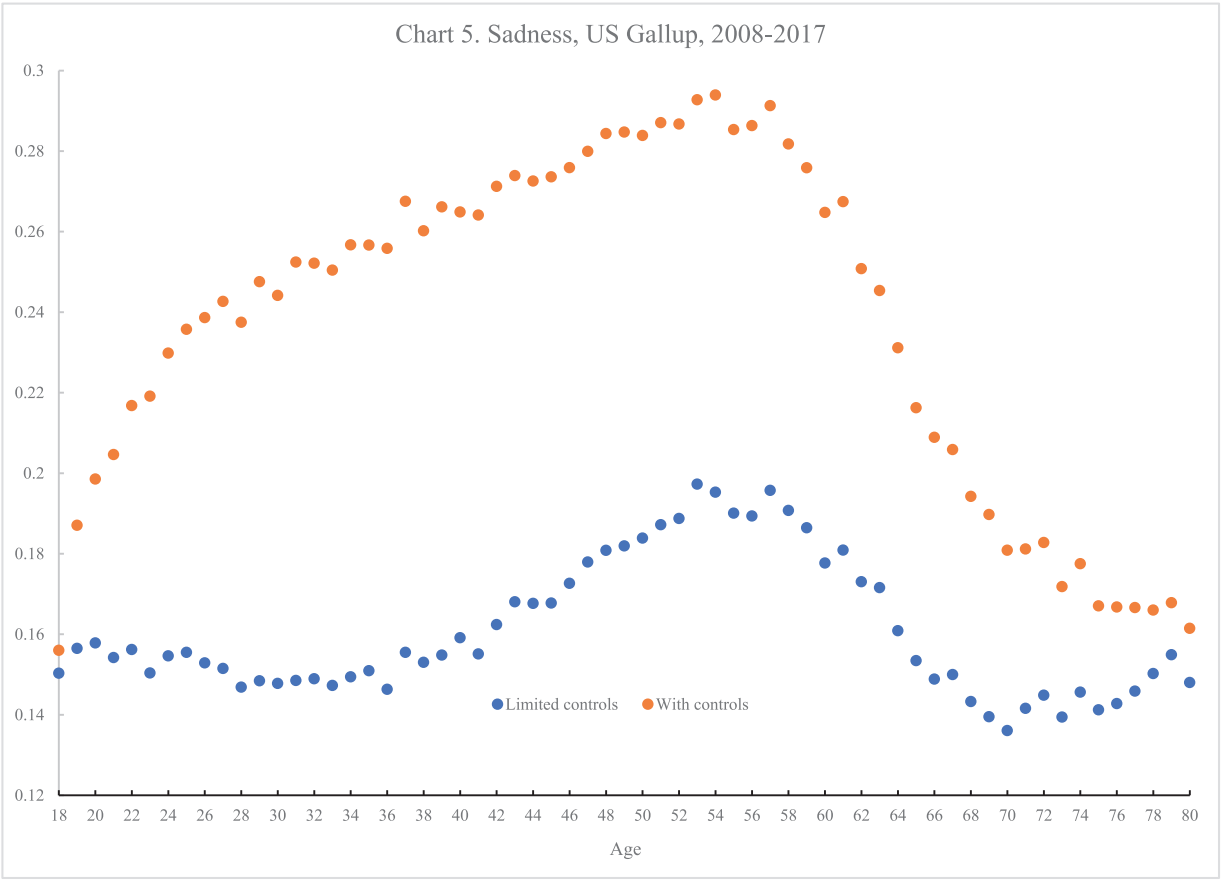

Chart 5. Sadness, US Gallup, 2008–2017.

Table 6
168 Countries Gallup World Poll, 2008–2017.

	Stress	Stress	Worry	Worry
Age 20–29	0.0660 (50.89)	.0561 (36.44)	.0714 (54.51)	.0771 (48.80)
Age 30–39	0.0972 (73.68)	.0856 (50.02)	.1056 (79.19)	.1132 (64.44)
Age 40–49	0.1032 (75.41)	.0921 (51.14)	0.1272 (91.94)	.1318 (71.25)
Age 50–59	0.0826 (57.51)	.0744 (39.90)	0.1398 (96.17)	.1395 (72.77)
Age 60–69	0.0164 (10.67)	.0200 (10.14)	0.1209 (77.50)	.1143 (56.36)
Age 70–79	−0.0249 (13.77)	−0.0160 (6.98)	0.1221 (66.57)	.1070 (45.31)
Age >=80	−0.0282 (11.28)	−0.0237 (7.90)	0.1078 (42.43)	.0896 (28.99)
Male	−0.0207 (30.64)	−0.0287 (36.30)	−0.0366 (53.67)	.0287 (35.43)
Labor force dummies	No	Yes	No	Yes
Race dummies	No	Yes	No	Yes
Education dummies	No	Yes	No	Yes
Marital status dummies	No	Yes	No	Yes
Country dummies	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes
Constant	.3729	.4187	.2428	.2628
Adjusted R^2	.0610	.0676	.0514	.0631
N	1814,703	1488,009	1919,377	1507,946
Maximum	43	44	58	56

T-statistics in parentheses. Mean of stress=0.314 and mean of worry=0.363.
Notes: The labor force status variable only available for 2009–2017.

Table 6 reports two sets of regression results for these two variables with limited and a full set of personal controls. Both sets of equations include both country and year dummies. There are hill shapes in stress as found using the same data by Graham and Ponzuelo (2017) who find it in many countries but also with the worry variable as found by Fortin et al. (2015). Both used the same Gallup World Poll data but from an earlier sub-sample of years from 2005–2014. The function maximizes in the early forties in the former case and in the early fifties in the latter. The sample is smaller with controls as

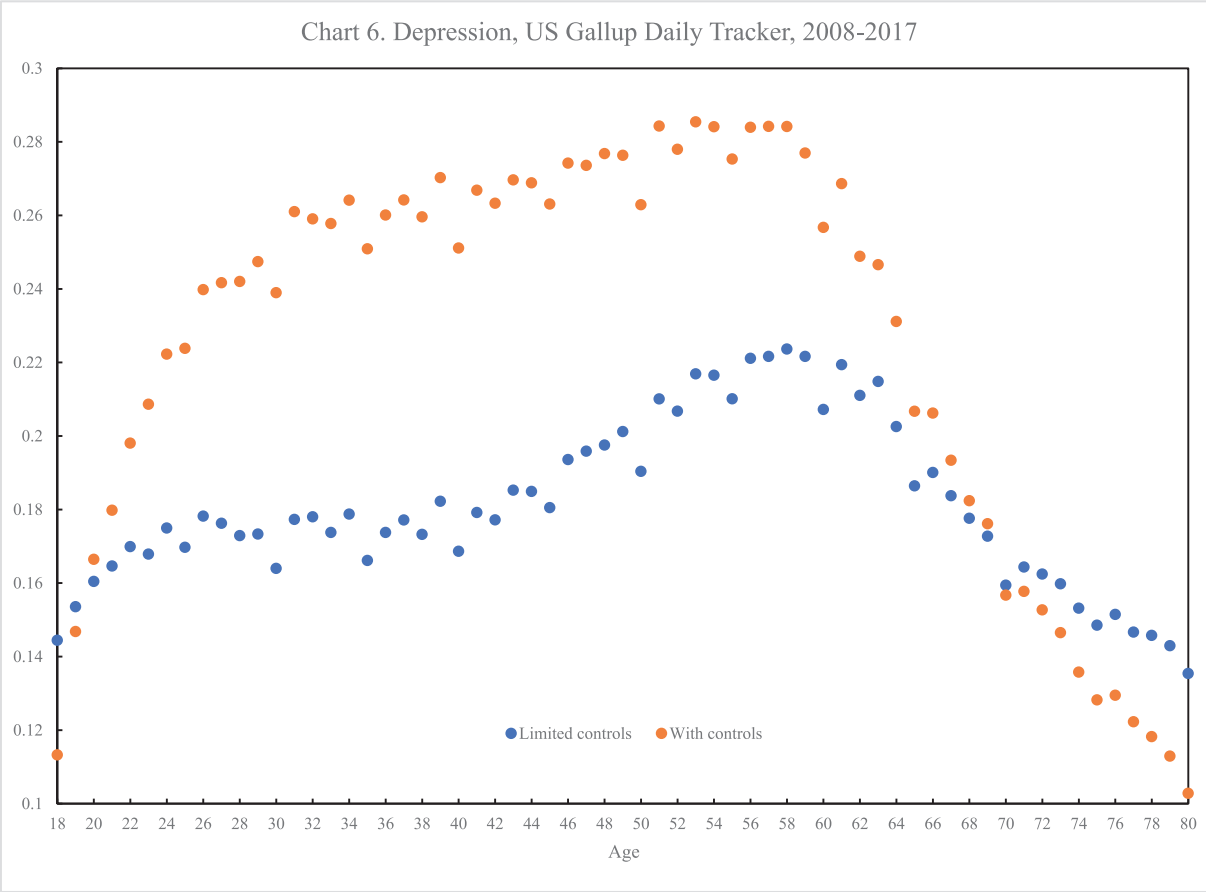

Chart 6. Depression, US Gallup Daily Tracker, 2008–2017.

the labor force status variable is only available for 2009–2019. Chart 8 plots single year of age by stress probabilities with limited controls and with full controls and Chart 9 does the same for worry, and there are well-defined hill-shapes in all cases. The turn down is greater with stress than worry, consistent with the raw data reported above.

2.4. Depression and bad nerves in the UK, 2014–2018

A hill shape in a depression variable for the UK was shown to exist in Blanchflower and Oswald (2008) in a sample of over a million respondents for the UK.[17] The data file used was the Labour Force Survey (LFS) from 2004Q2-2007Q1 and depression was obtained using responses to the main health problem respondents reported – which was in response to the question below.

Q7. What is your main health problem – depression and bad nerves?

The raw data were plotted (their Fig. 1) and showed an obvious hump shape. Probit regressions were run (their Table 7) which showed the inverted U-shape using a quadratic in age without controls and then with controls for region of residence, education, marital and labor force status and the age coefficient was positive, and age squared coefficient negative. The function maximized at age 44 with and without controls.

Bell and Blanchflower (2019) examined these data and showed that there was a steady rise over time in the incidence of depression using the same variable and data files. In 1997 they found that 0.6% of respondents reported being depressed versus 1.5% in 2008 and 2009. In the subsequent years there was a sharp rise – 2010=1.6%; 2011=1.7%; 2012=1.9%; 2013; 2.0%; 2014: 2.4%; 2015=2.7%; 2016=2.9%; 2017=3.3% and 2018=3.6%. Interestingly, Bell and Blanchflower (2019) noted that happiness in the UK has been on the rise post 2008 although they also found that anxiety, that we look at below, also rose in the years since 2015 (their Table 5).

[17] Bell and Blanchflower (2019) showed that there has been a marked rise over the years in the incidence of depression prior to the Great Recession from 0.6% in 1997 to 1.5% in the years 2004-2007 but has accelerated since then to 3.6% in 2018.

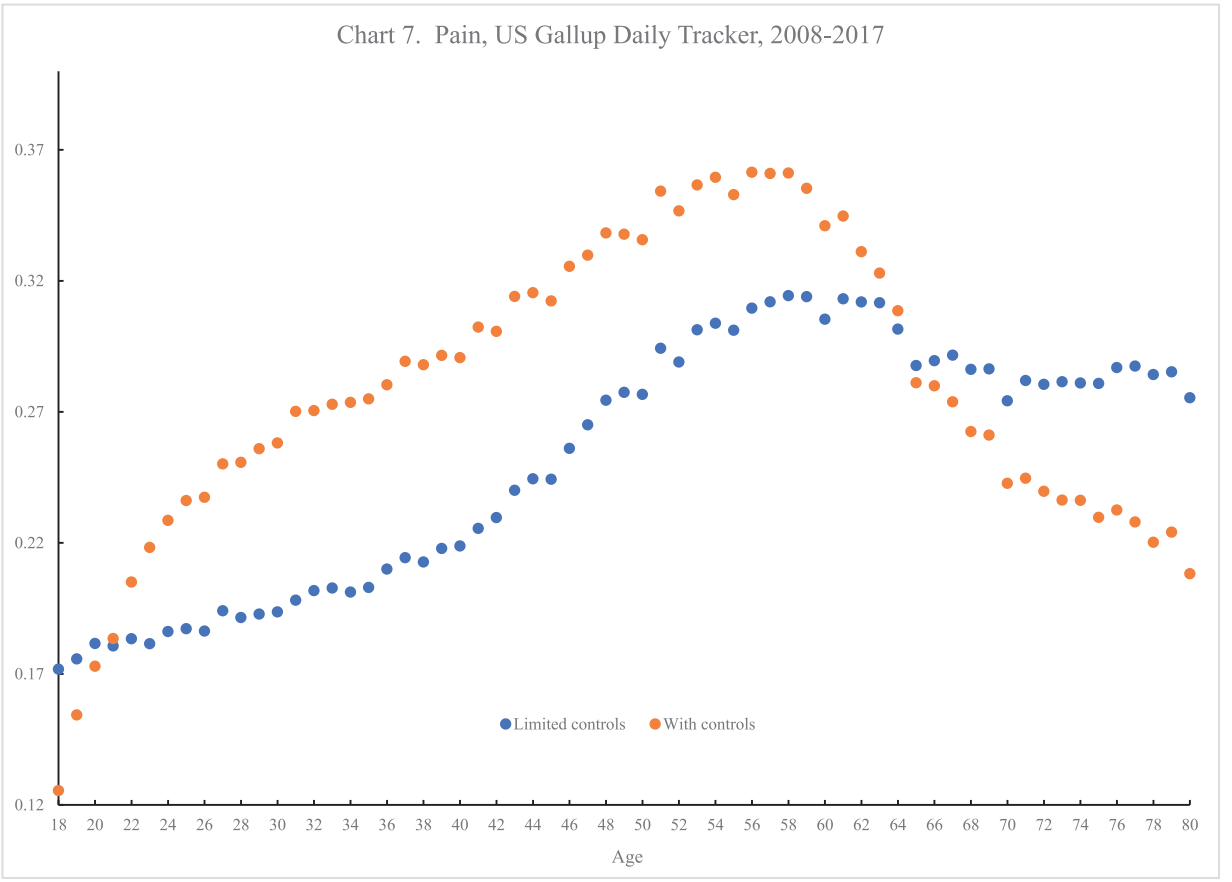

Chart 7. Pain, US Gallup Daily Tracker, 2008–2017.

I update the Blanchflower and Oswald (2008) analysis with the most recent LFS data available for the period 2014–2018 with more than 1.3 million observations. I first examine the data with limited controls of year and region and then with controls for gender, marital and labor force status and education added. Columns 1 and 2 of Table 7 model depression and confirms the hump shape with a peak for ages 40–49 with controls. The picture shown in Chart 10 is comparable to that found for the period a decade earlier with hill shapes with limited controls or with a full set of socioeconomic controls.[18]

2.5. Phobia, panics and mental illness in the UK, 2016–2018

The LFS files also contain data on mental illness, phobias and panics that Blanchflower and Oswald (2008) did not examine. This variable has a much lower incidence than depression does although it has seen a small increase since the Brexit vote in 2016 (1.1% in 2014 and 2015; 1.2% in 2016; 1.3% in 2017 and 2018).

Q8. What is your main health problem – mental illness, phobias or panics?

Chart 11 shows there is no hill or hump shape without controls in anxiety but there is one with them. Columns 3 and 4 of Table 7 shows a hump shape with controls with a peak at age 40–49 but not with limited controls. Of note here is the insignificant male coefficient.

2.6. Sleep, strain; unhappy and depressed, can't overcome difficulties, losing confidence and feeling worthless, in thirteen European countries, 2001[19]

Blanchflower and Oswald (2008) identified a hump-shape between the so-called GHQ6 (General Health Questionnaire) psychiatric measure and age using data from #56.1 Eurobarometer. GHQ6 is a measure of psychological distress that comes from amalgamating answers to the following six questions, with sample sizes in parentheses.

Have you recently:

[18] The limited controls here also include race dummies.

[19] The thirteen countries are Austria; Belgium; Denmark; Finland; France; Germany; Greece; Ireland; Italy; Luxembourg; Netherlands; Portugal and Spain.

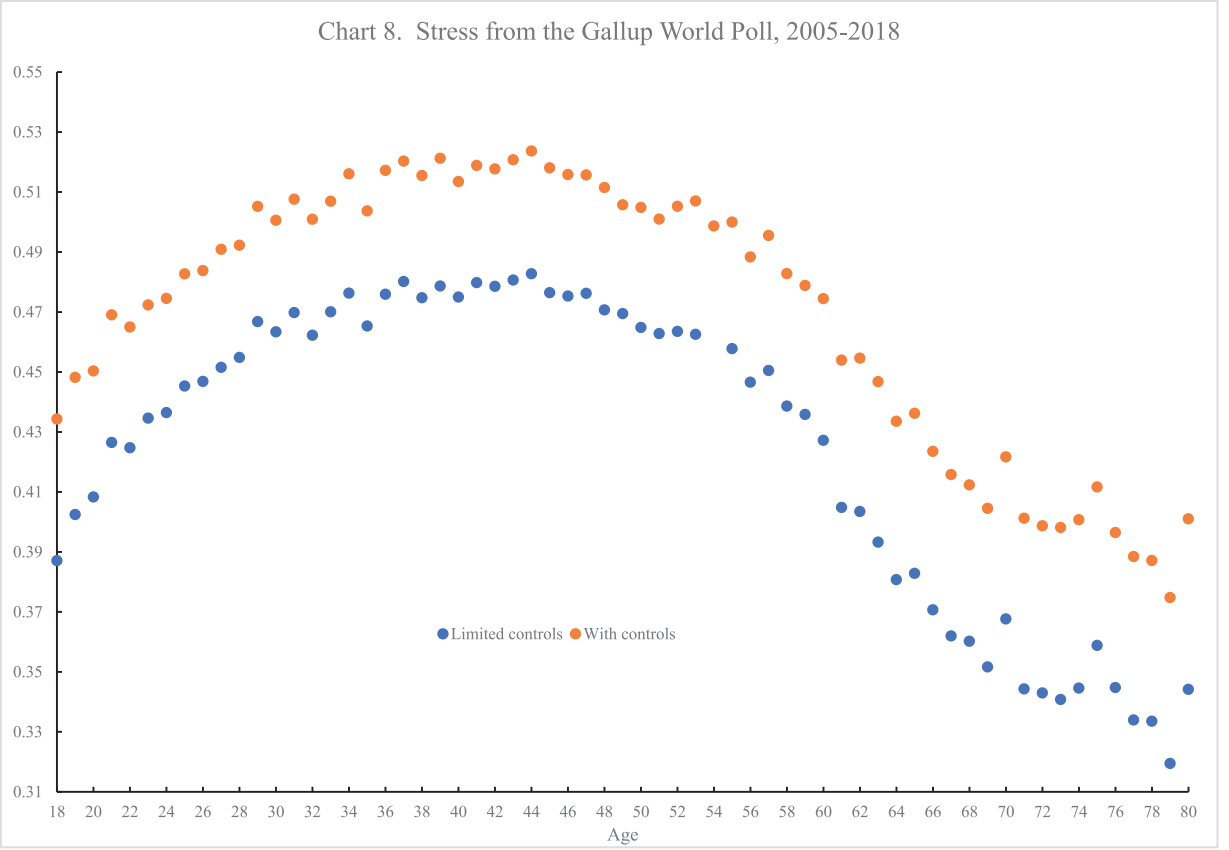

Chart 8. Stress from the Gallup World Poll, 2005–2018.

Table 7
Main health problems in the UK, LFS 2014–2018.

	Depression and bad nerves		Mental Illness, phobias and panics	
Age 20–29	.0151 (20.78)	.0366 (48.44)	.0029 (6.39)	.0073 (15.80)
Age 30–39	.0145 (20.48)	.0482 (61.59)	.0002 (0.60)	.0111 (23.38)
Age 40–49	.0141 (20.17)	.0496 (62.23)	−0.0004 (1.08)	.0114 (23.49)
Age 50–59	.0070 (10.10)	.0408 (50.54)	−0.0017 (3.83)	.0103 (20.69)
Age 60–69	−0.0056 (7.85)	.0136 (16.63)	−0.0059 (13.63)	.0058 (11.42)
Age 70–79	−0.0128 (16.52)	.0268 (15.53)	−0.0079 (16.562)	.0000 (0.01)
Age >=80	−0.0174 (15.01)	.0206 (10.14)	−0.0001 (0.23)	.0069 (5.53)
Male	−0.0160 (54.62)	−0.0123 (41.15)	−0.0000 (0.07)	.0002 (1.14)
Education dummies	No	Yes	No	Yes
Marital status dummies	No	Yes	No	Yes
Labor force status dummies	No	Yes	No	Yes
Race dummies	No	Yes	No	Yes
Year dummies	Yes	Yes	Yes	Yes
Region dummies	Yes	Yes	Yes	Yes
Constant	.0186	−0.0098	.0119	−0.0128
Adjusted R^2	.0040	.0197	.0011	.0064
N	1363,511	1363,511	1364,718	1363,511
Maximum	35	43	n/a	45

T-statistics in parentheses. Mean of depression=0.0303 and mean of phobia=0.0114.

Q9. Lost much sleep over worry? (n = 15,782).
Q10. Felt constantly under strain? (n = 15,756).
Q11. Felt you could not overcome your difficulties? (n = 15,752).
Q12. Been feeling unhappy and depressed? (n = 15,789).
Q13. Been losing confidence in yourself? (n = 15,754).
Q14. Been thinking of yourself as a worthless person? (n = 15,714).

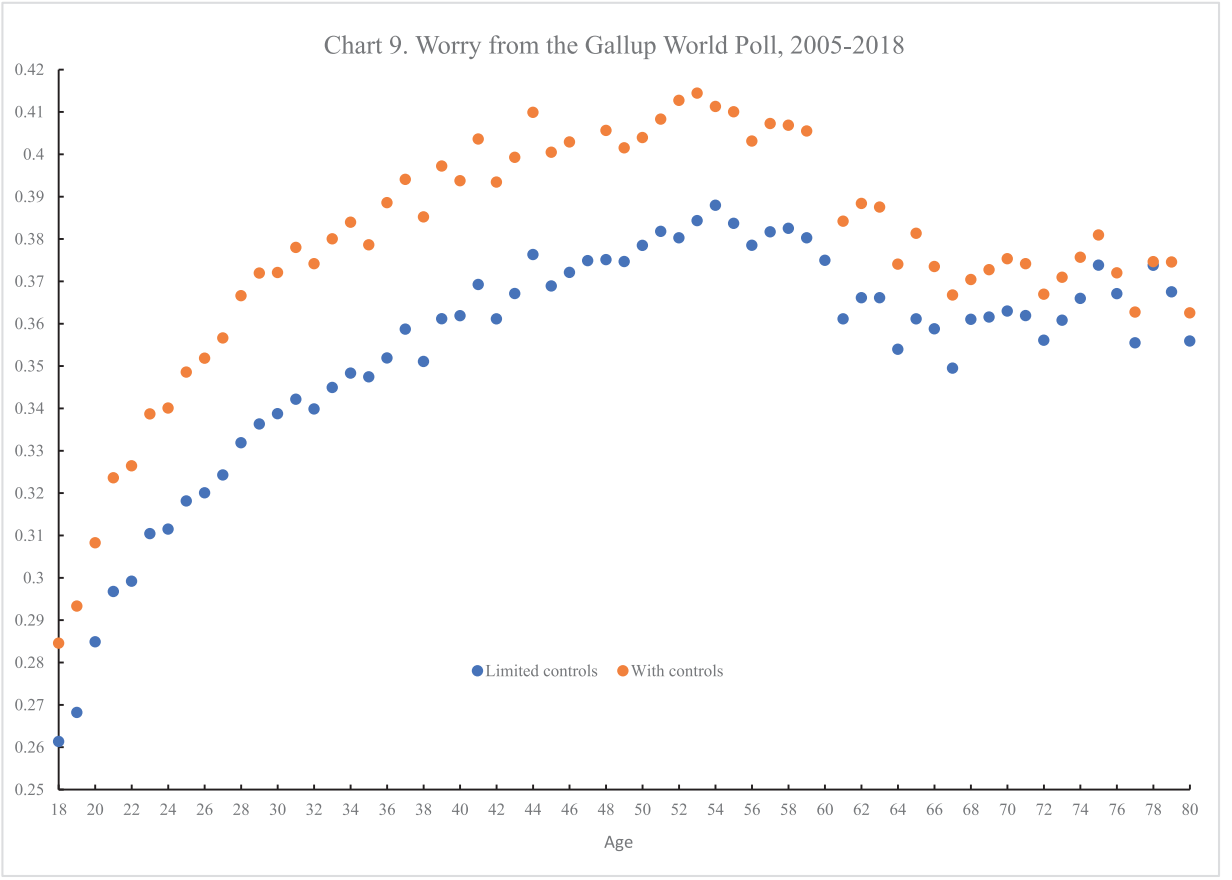

Chart 9. Worry from the Gallup World Poll, 2005–2018.

The integers 0, 1, 2, 3 were assigned to each variable depending whether each was answered *not at all (=0), no more than usual (=1), rather more than usual (=2), much more than usual (=3)*. The numerical answers were then summed. Overall, a GHQ6 mental distress score which must by definition lie between 0 and 18, was examined, such that, the higher the score the more distress. Blanchflower and Oswald (2008) found that there was a hump U-shape in age across countries with this GHQ6 variable, with a limited or full set of personal controls. But we did not investigate the individual components of the score. That is what I do in Table 8, with and without controls. In all six examples, with the dependent variable scored from zero to three, there is a hump or hill shape with and without controls. The calculated maxima based on the age quadratics for all six variables, whether there are controls or not, are in the forties and fifties.

Chart 12 is of interest as it plots the single year of age dummies with controls with GHQ6 and life satisfaction variables that are uniquely both available in Eurobarometer #56.1. The two series look to be mirror images of each other with a minimum in happiness and a maximum in unhappiness around age 50.

2.7. Anxiety in the UK Annual Population Survey, 2016–2018

UK data on anxiety is available from the Annual Population Survey collected by the Office of National Statistics. This survey has been collecting individual level well-being data on anxiety, as well as happiness, life satisfaction and worthwhileness, since 2011 (Blanchflower, 2020a). I examine the most recent data available for 2016–2018, using this 10-step question on anxiety with the exact wording as follows again with the number of observations in parentheses.[20]

Q15. Anxious (1). - On a scale where nought is 'not at all anxious' and 10 is 'completely anxious', overall, how anxious did you feel yesterday? (n = 269,030).

[20] Bell and Blanchflower (2019) also report a hill shape in the UK in anxiety with these data.

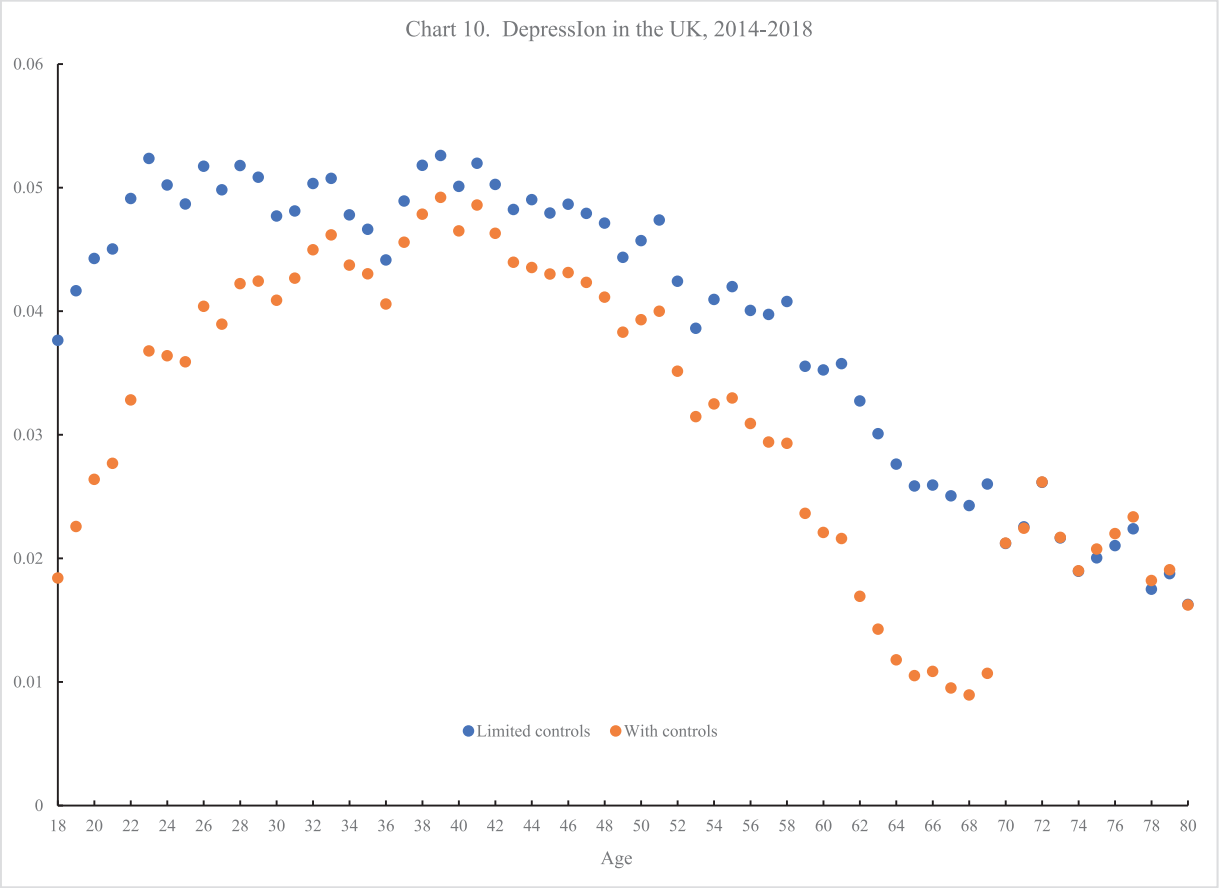

Chart 10. DepressIon in the UK, 2014–2018.

The raw data, weighted by the variable *pwt*, shows that anxiety peaks between ages forty and sixty and then falls away.

Age <20	2.84
Age 20–29	2.96
Age 30–39	2.97
Age 40–49	3.05
Age 50–59	3.04
Age 60–69	2.74
Age 70–79	2.55
Age 80+	2.58
All	2.88

Table 9 reports OLS regression results with 11-step anxiety as the dependent variable. In both columns 1 and 2 with limited controls and a fuller set of controls there is evidence of a hill shape in anxiety, maximizing once in the 50–59 age band in the former case and 40–49 in the latter. Chart 13 shows an obvious bulge at prime age with limited and full controls when the single year of age controls are added to the constant. This is analogous to the U-shapes in age from these same data files using life satisfaction and happiness reported in Blanchflower (2020a).

Column 1 of Table 10 also examines anxiety, using data from waves 3 and 6 the European Social Survey.[21] The question is somewhat different to the one asked in the UK.

Q16. How often over the past week have you felt anxious? All of the time =6; most of the time=5; more than half of the time=4; less than half of the time=3; some of the time=2; at no time=1? (n = 92,127).

[21] The appendix reports the regression results for the variables in Tables 10 and 12 without controls, which mostly do not show hump shapes.

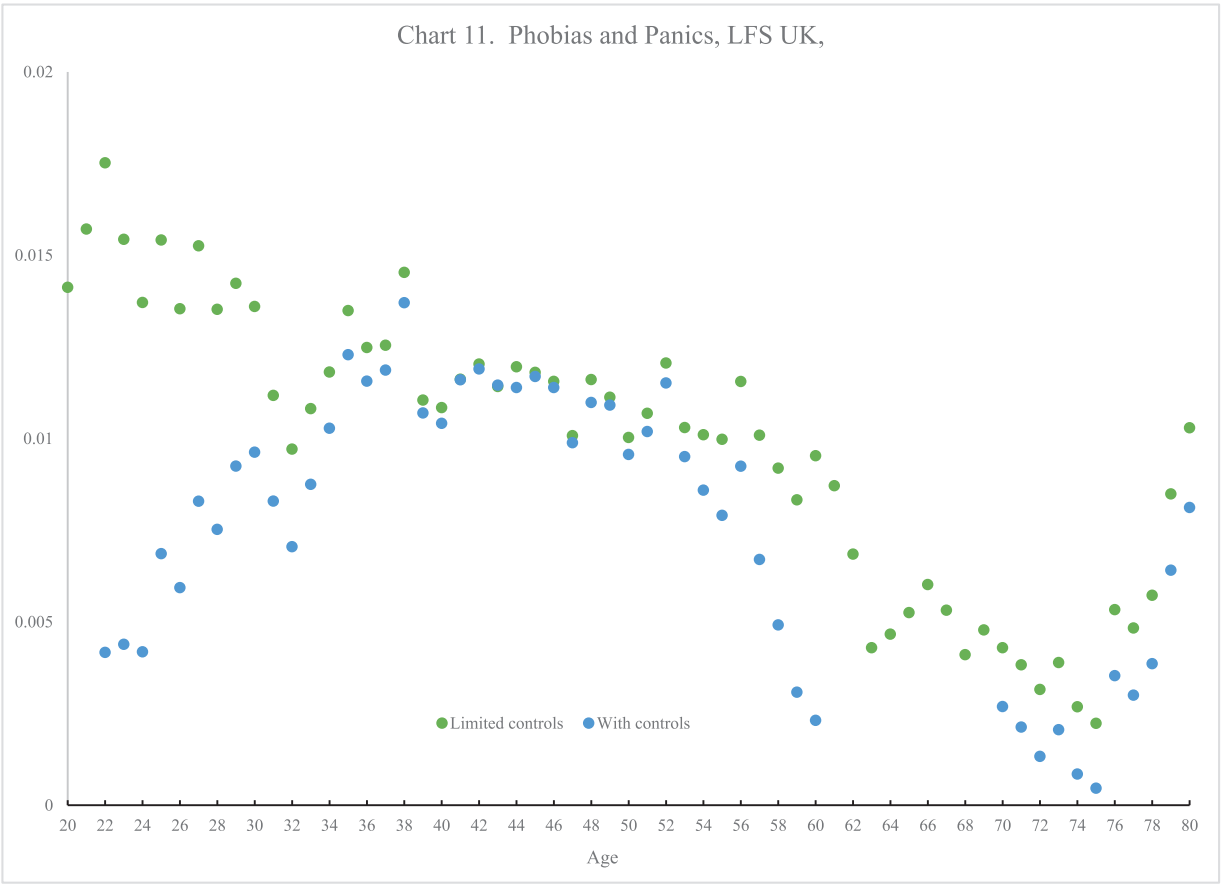

Chart 11. Phobias and Panics, LFS UK,.

Despite the difference in question design the relationship with age is similar - there is a hill shape and the maximum is located in the 40–49 age band and calculated as 48 using the age quadratic with controls.

2.8. Feeling a failure and for most people life is getting worse, European Social Survey, 2006 and 2012

I now move to examine unhappiness data across 32 European countries using data from sweep 3 (2006) and sweep 6 (2012) of the European Social Surveys (ESS).[22] In column 2 of Table 10 unhappiness is now measured by reference to a question on whether at times the individual feels they are a failure, again with controls. The hill shape is present again with a maximum at age 45 using the quadratic.

Q17. At times, I feel a failure? Disagree strongly=1; disagree=2; neither agree nor disagree=3; agree=4 and agree strongly=5? (n = 92,082).

The final column of Table 10 refers more broadly to an individual's views on unhappiness in society as a whole, contained in waves 3 and 6 of the ESS.

I am also interested in how much more broadly the hill shape occurs given the evidence presented in Blanchflower (2020a) that the hump shape was found in many variables relating to living standards, politics and economics including the state of the national economy. In sweeps 3 and 6 of the ESS respondents were asked the following

Q18. For most people in country life is getting worse - Disagree strongly=1; disagree=2; neither agree nor disagree=3; agree=4 and agree strongly=5? (n = 91,276).

In answer to Q18 22% agree and 3% agree strongly while in Q12 38% agree and 21% agree strongly. There is evidence in column 3 of the table of a hump shape in age, maximizing at age 56, with controls, suggesting the unhappiness hill shape may have broader applicability.

[22] The countries are Austria; Belgium; Bulgaria; Croatia; Cyprus; Czech Republic; Denmark; Estonia; Finland; France; Germany; Greece; Hungary; Iceland; Ireland; Israel; Italy; Lithuania; Luxembourg; Netherlands; Norway; Poland; Portugal; Russia; Slovakia; Slovenia; Spain; Sweden; Switzerland; Turkey; Ukraine and United Kingdom.

Table 8
Six GHQ Unhappiness Measures, 2001.

	Lost much sleep over worry		Feeling unhappy and depressed		Losing confidence in yourself	
Age 20–29	.2057 (6.98)	.1393 (4.17)	.1629 (5.70)	.1445 (4.49)	.1146 (4.50)	.1206 (4.18)
Age 30–39	.3217 (11.11)	.2304 (5.98)	.1961 (6.99)	.1959 (5.28)	.1276 (5.10)	.1579 (4.75)
Age 40–49	.3937 (13.25)	.2905 (7.28)	.2684 (9.32)	.2554 (6.65)	.1802 (7.02)	.1993 (5.79)
Age 50–59	.3786 (12.56)	.2570 (6.26	.2633 (9.01)	.2224 (5.63)	.1439 (5.52)	.1339 (3.78)
Age 60–69	.2725 (8.92)	.1408 (3.13)	.1634 (5.52)	.0745 (1.72)	.0746 (2.82)	.0064 (0.16)
Age 70–79	.2291 (6.89)	.0847 (1.72)	.2053 (6.37)	.0717 (1.51)	.1123 (3.90)	.0107 (0.25)
Age >=80	.1921 (4.18)	.0149 (0.25)	.1658 (3.73)	−0.0287 (0.50)	.1219 (3.06)	−0.0172 (0.33)
Controls	No	Yes	No	Yes	No	Yes
Constant	.6257	.7155	.5596	.6562	.4643	.5091
Adjusted R^2	.0531	.0744	.0298	.0743	.0199	.0564
N	15,782	15,779	15,789	15,786	15,754	15,751
Maximum	51	51	52	51	50	47
Mean	0.78		0.60		0.70	
	Could not overcome difficulties		Constantly under strain		Thinking yourself a worthless person	
Age 20–29	.1217 (4.46)	.1136 (3.69)	.2001 (7.09)	.2024 (6.27)	.0728 (3.18)	0.0473 (1.82)
Age 30–39	.1409 (5.25)	.1419 (3.99)	.2460 (8.88)	.2504 (6.72)	.0930 (4.13)	0.0707 (2.36)
Age 40–49	.2007 (7.29)	.1842 (5.01)	.2654 (9.33)	.2613 (6.78)	.1564 (6.77)	0.1231 (3.96)
Age 50–59	.1531 (5.48)	.1051 (2.78)	.2072 (7.18)	.1972 (4.98)	.1347 (5.75)	0.0811 (2.54)
Age 60–69	.0663 (2.34)	−0.0301 (0.73)	−0.0002 (0.01)	.0155 (0.36)	.0596 (2.51)	−0.0224 (0.64)
Age 70–79	.0865 (2.80)	−0.0419 (0.92)	−0.0500 (1.57)	−0.0394 (0.83)	.0945 (3.65)	−0.0077 (0.20)
Age >=80	.1138 (2.67)	−0.0523 (0.95)	−0.0974 (2.21)	−0.1188 (2.06)	.1611 (4.50)	- 0.0320 (0.69)
Controls	No	Yes	No	Yes	No	Yes
Constant	.5620	.6779	.6057	.6101	.2782	.3668
Adjusted R^2	.0317	.0728	.0479	.0651	.0263	.0593
N	15,752	15,749	15,756	15,753	15,754	15,711
Maximum	48	44	41	43	55	53
Mean	0.48		0.70		0.36	

Controls are male, education; marital and labor force status and 14 country dummies Source: Eurobarometer #56.1, Sept.- Oct. 2001.

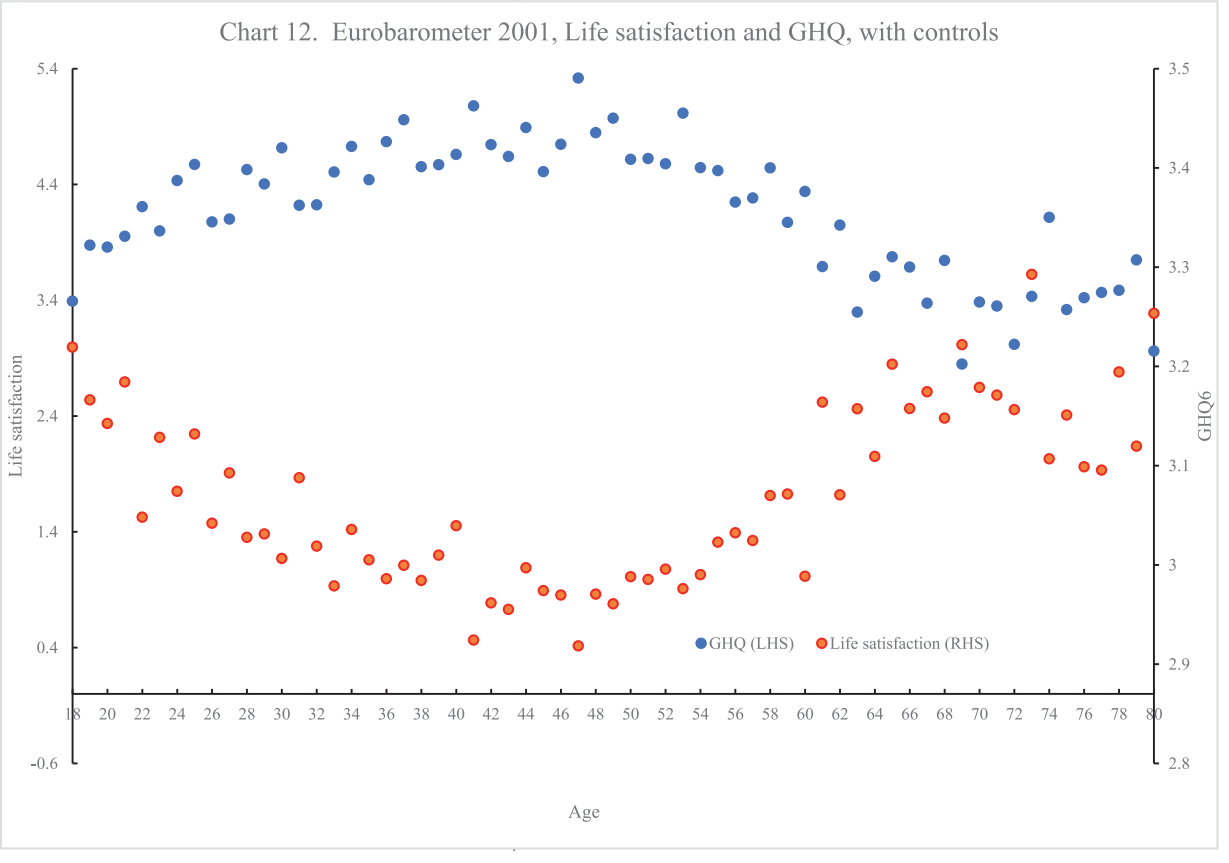

Chart 12. Eurobarometer 2001, Life satisfaction and GHQ, with controls.

Table 9
11-step Anxiety in the UK, APS 2016–2018.

	Limited controls	With controls
Age 20–29	.1202 (2.34)	.3614 (7.00)
Age 30–39	.1360 (2.71)	.5529 (10.81)
Age 40–49	.2412 (4.82)	.6870 (13.36)
Age 50–59	.2479 (4.98)	.6597 (12.83)
Age 60–69	−0.0582 (1.17)	.1454 (2.81)
Age 70–79	−0.2355 (4.68)	.0047 (0.07)
Age 80+	−0.2266 (4.26)	−0.2355 (1.29)
Male	−0.3852 (34.71)	−0.3030 (24.26)
Education dummies	No	Yes
Marital status dummies	No	Yes
Labor force status dummies	No	Yes
Year dummies	Yes	Yes
Region dummies	Yes	Yes
Constant	2.7472	2.5608
Adjusted R^2	.0081	.0201
N	269,358	218,170
Maximum	40	44

Mean of dependent variable=2.86.
Excluded categories age 16–19, employee, white, degree, never married.

Table 10
Unhappiness. European Social Survey (sweeps 3 and 6).

	Anxious	Feel a failure	Life getting worse
Age 20–29	.1070 (7.84)	0.0837 (4.19)	0.0930 (5.07)
Age 30–39	.1391 (9.11)	0.2100 (9.39)	0.1525 (7.44)
Age 40–49	.1519 (9.78)	0.2100 (9.23)	0.2054 (9.86)
Age 50–59	.1428 (9.06)	0.1911 (8.29)	0.2275 (10.77)
Age 60–69	.0893 (5.29)	0.0772 (3.13)	0.1937 (8.57)
Age 70–79	.0978 (5.34)	.0060 (0.23)	0.1476 (6.01)
Age >=80	.0361 (1.75)	−0.1052 (3.47)	0.1016 (3.67)
Male	−0.1149 (23.84)	−0.1664 (23.57)	−0.0815 (11.43)
Education dummies	Yes	Yes	Yes
Marital status dummies	Yes	Yes	Yes
Labor force status dummies	Yes	Yes	Yes
Sweep dummies	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes
Constant	1.5839	2.1070	3.2101
Adjusted R^2	.1581	.1298	.2532
N	92,127	92,082	91,276
Mean	1.66	2.41	3.59
Maximum	48	45	56

T-statistics in parentheses.

2.9. Loneliness, sadness and depression, European Social Surveys, 2006, 2012 and 2014

Table 11 now turns to other ways of distinguishing unhappiness in 32 European countries in sweeps 3 (2006), 6 (2012) and 7 (2014) of the ESS. The four questions asked were as follows.

Q19. Lonely. Felt lonely last week? None or almost none of the time=1; some of the time=2; most of the time=3; all or almost all of the time=4? (n = 131,508).

Q20. Sad. Felt sad, how often over the past week? None or almost none of the time=1; some of the time=2; most of the time=3; all or almost all of the time=4? (n = 131,457).

Q21. Depressed. Felt depressed how often past week? None or almost none of the time=1; some of the time=2; most of the time=3; all or almost all of the time=4? (n = 131,470).

The first three columns of Table 11 show that with standard controls there are hill shapes in every case. The maximum in each case is around sixty.

2.10. Short and restless sleep (ESS and BRFSS)

The final column of Table 11 investigates the relationship between age and restless sleep based on the following question.

Q22. Sleep. Sleep was restless how often in the past week? None or almost none of the time=1; some of the time=2; most of the time=3; all or almost all of the time=4? (n = 131,797).

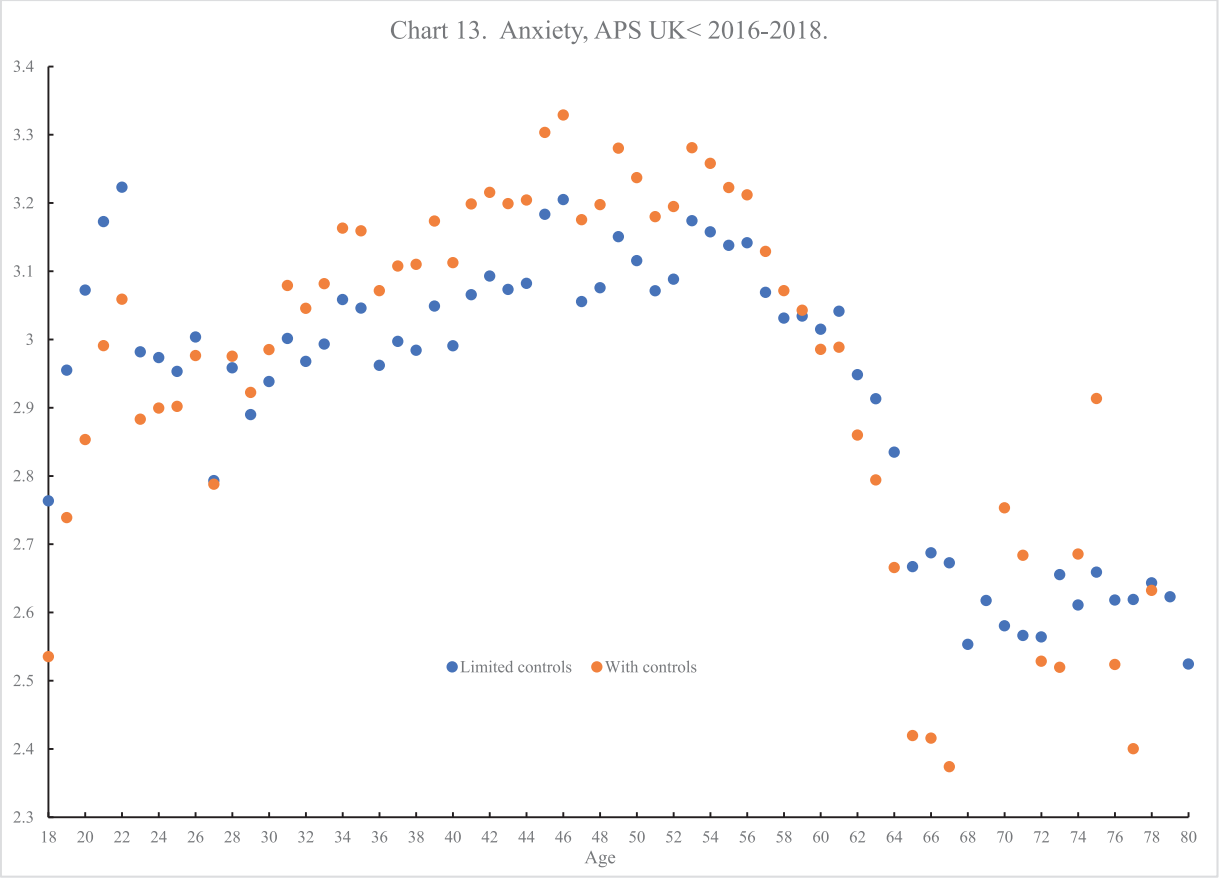

Chart 13. Anxiety, APS UK< 2016–2018.

Table 11
Unhappiness - European Social Survey (sweeps 3, 6 and 7).

	Lonely	Sad	Depressed	Restless sleep
Age 20–29	0.1146 (10.25)	0.0670 (6.17)	.0895 (8.21)	0.1440 (10.59)
Age 30–39	0.1615 (12.90)	.0984 (8.09)	0.1271 (10.44)	.1821 (11.97)
Age 40–49	0.1805 (14.16)	.1307 (10.55)	0.1513 (12.21)	.2011 (12.97)
Age 50–59	0.1802 (13.98)	0.1311 (10.45)	0.1502 (1.98)	.2485 (15.84)
Age 60–69	0.1354 (9.84)	.0813 (6.08)	0.0889 (6.64)	.1988 (11.88)
Age 70–79	.1461 (9.76)	0.0873 (6.00)	0.1077 (7.39)	.2190 (12.02)
Age >=80	.1961 (11.69)	0.0844 (5.17)	.1203 (7.36)	0.1750 (8.57)
Male	−0.0440 (11.25)	−0.1391 (36.57)	−0.1185 (7.36)	−0.1599 (33.60)
Education dummies	Yes	Yes	Yes	Yes
Marital status dummies	Yes	Yes	Yes	Yes
Labor force status dummies	Yes	Yes	Yes	Yes
Sweep dummies	Yes	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes	Yes
Constant	1.2226	1.4657	1.4357	1.6393
Adjusted R^2	.1512	.1307	.1215	.0706.
N	131,508	131,457	131,470	131,797
Mean	1.45	1.59	1.50	1.79
Maximum	63	57	57	59

It shows a hill shape in restless sleep, comparable to that reported in Table 8 which tracks whether a respondent reported losing sleep over worry.

There is also evidence from the BRFSS 2013–2019 for the United States with nearly two million observations on self-reported short sleep, defined as <7 h of sleep per night (Blanchflower 2020b). This variable is derived from the following question Q23.

Q23. Hours of sleep. On average, how many hours do you get in a 24-hour period? (n = 1918,414).

Table 12
Probability of short sleep (<7 h) in the USA, BRFSS 2013–2019.

Age 20–29	0.0622 (21.04)	.0811 (26.18)
Age 30–39	.0939 (32.23)	.1229 (38.25)
Age 40–49	.0866 (30.02)	.1094 (33.90)
Age 50–59	.0762 (26.83)	.0873 (27.29)
Age 60–69	.0098 (3.47)	.0447 (13.78)
Age 70–80	−0.040 (15.57)	.0044 (1.31)
Male	.0014 (1.06)	.0088 (12.43)
Education dummies	No	Yes
Marital status dummies	No	Yes
Labor force status dummies	No	Yes
Year dummies	Yes	Yes
State dummies	Yes	Yes
Constant	.3351	.2458
Adjusted R^2	.0181	0.0399
N	1918,414	1886,055
Mean	0.322	
Maximum	40	40

Table 13
EQLS 2007–2016, waves 2–4.

	Lonely	Downhearted	Left out	Tense
Age 20–29	0.2394 (7.55)	.2446 (7.85)	.1289 (6.31)	.1391 (4.08)
Age 30–39	.3929 (12.10)	.3814 (11.94)	.2231 (10.63)	.2598 (7.44)
Age 40–49	.4208 (12.83)	.4226 (13.11)	.2300 (10.85)	.2843 (8.06)
Age 50–59	.4364 (13.23)	.4526 (13.96)	.2306 (10.81)	.2459 (6.93)
Age 60–69	.3235 (9.71)	.3250 (9.92)	.1688 (7.82)	−0.0139 (0.39)
Age 70–79	.3970 (11.47)	.3837 (11.28)	.1878 (8.34)	−0.0543 (1.46)
Age >=80	.4395 (11.41)	.3516 (9.29)	.2351 (9.27)	−0.1733 (4.19)
Male	−0.0778 (8.65)	−0.1378 (5.56)	.0008 (0.14)	−0.1244 (12.87)
Education dummies	Yes	Yes	Yes	Yes
Marital status dummies	Yes	Yes	Yes	Yes
Labor force status dummies	Yes	Yes	Yes	Yes
Sweep dummies	Yes	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes	Yes
Constant	1.3591	1.6989	1.5763	2.5596
Adjusted R^2	.1392	.1061	.0788	.0622
N	79,572	79,462	114,247	79,522
Mean	1.96	2.01	1.97	2.53
Maximum	58	55	54	41

Data are available from 2013–2019 (n = 1918,414) and are rounded to whole numbers (Blanchflower, 2020b). Here I build on work of Liu et al. (2016) who found the proportion with short sleep of <7 h using the BRFSS data for 2014 followed a hill shape with a maximum in the age group of 45–64.[23] The authors note that although almost two thirds of U.S. adults sleep ≥7 h in a 24 h period while an estimated 83.6 million U.S. adults sleep <7 h.

The weighted distribution of hours in the pooled 2013–2018 data was as follows: <6 h = 11%; 6 = 22%; 7 = 30%; 8 = 29%; 9 = 5% and 10 or more 4%. Following Liu et al. (2016) I classify short sleep as less than 7 h, which varies, using the weight variable *_finalwt*, by age group as follows with a peak at age 40–49. Age <20 = 0.295; 20–29 = 0.357; 30–39 = 0.383; 40–49 = 0.390; 50–59 = 0.381; 60–69 = 0.317 and 707–80 = 0.255. There is thus an obvious hill shape again in these raw data. It turns out there is also in the regressions with and without controls as shown in Table 12. [24] Chart 14 plots the single year of age coefficients that are added to the constant when the two equations in Table 12 are re-estimated, with limited and a full set of controls. In both cases there are hump shapes, maximizing in the late thirties.

2.11. Loneliness (2); feeling downhearted and depressed, left out and tense in Europe, European Quality of Life Survey, 2007–2016

I examined the responses in the ESS above to a question on loneliness in the last two weeks. Table 13 uses data from the latest three sweeps of the European Quality of Life Surveys (EQLS) for wave 2 (2007), wave 3 (2012) and wave 4 (2016) for 35 European countries with data available on four unhappiness measures (1) being lonely; (2) feeling downhearted and

[23] The rates by age found by Liu et al (2016) were as follows: 18-24=32.2%; 25-34=37.9%; 35-44=38.3%; 45-64=39.0% and ≥65=35.5%.
[24] In contrast sleep duration follows a U-shape in age. (Blanchflower, 2020b).

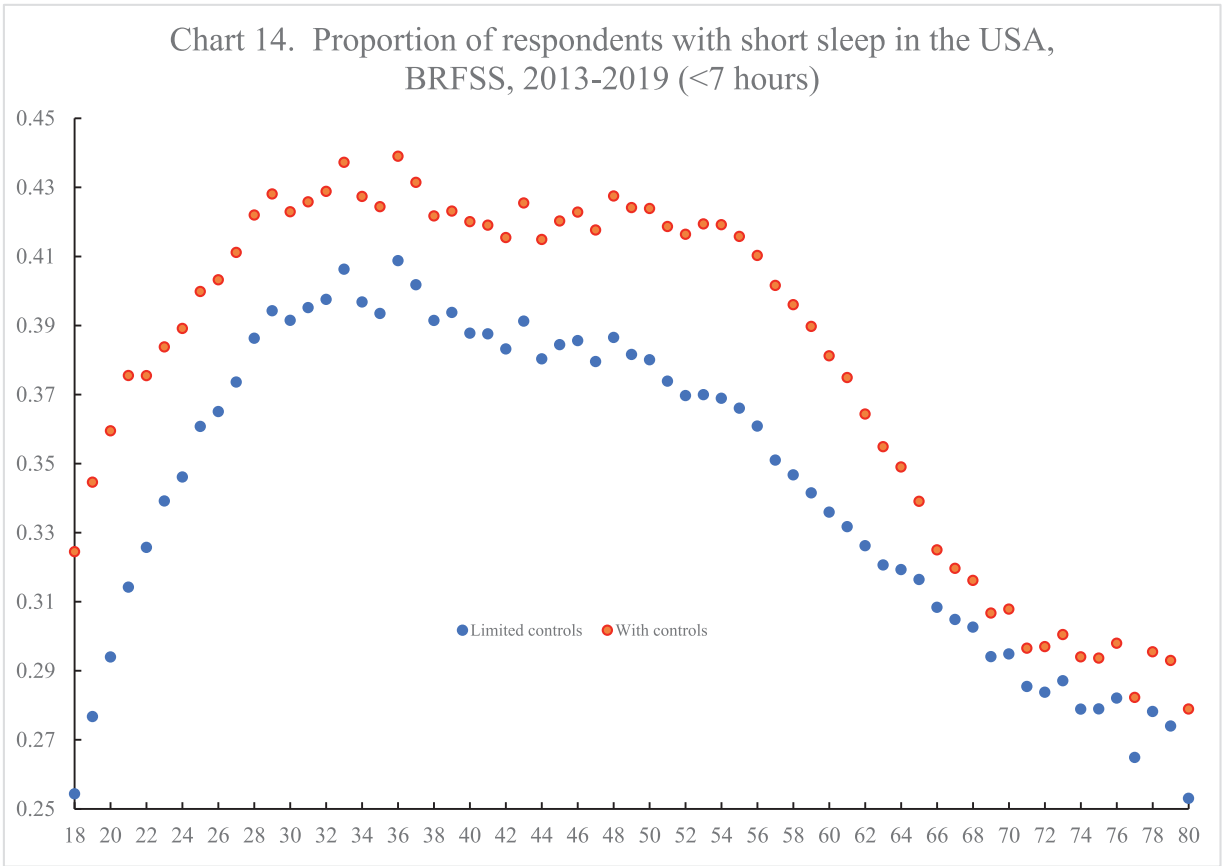

Chart 14. Proportion of respondents with short sleep in the USA, BRFSS, 2013–2019 (<7 h).

depressed (3) feeling left-out of society 4) feeling particularly tense and generate ceteris paribus hill shapes with controls.[25] The data are taken from waves 3 and 4 except left out which also is in wave 2. The questions asked were as below.

Q24. Lonely. Please indicate for each of the statements which is closest to how you have been feeling over the last two weeks. I have felt lonely - at no time=1; some of the time=2; less than half time=3; more than half the time=4; most of the time=5; all of the time=6. (n = 79,572).

Q25. Downhearted. Please indicate for each of the statements which is closest to how you have been feeling over the last two weeks. I have felt downhearted and depressed - at no time=1; some of the time=2; less than half time=3; more than half the time=4; most of the time=5; all of the time=6. (n = 79,462).

Q26. Left out. Please indicate for each of the statements which is closest to how you have been feeling over the last two weeks. I feel left out of society - never=1; less often/rarely=2; several times a year=3; several times a month=4; several times a week=5) (n = 114,247).

Q27. Tense. Please indicate for each of the statements which is closest to how you have been feeling over the last two weeks. I have felt particularly tense - at no time=1; some of the time=2; less than half time=3; more than half the time=4; most of the time=5; all of the time=6. (n = 79,522).

Table 13 shows that with controls there is a hump shape for all four variables. The unhappiness curve is found in every case with controls and without controls in the BRFSS for the US; the LFS and APS in the UK and the Eurobarometer. It is hard to find without controls using the ESS or EQLS (see Appendix A).[26]

[25] The countries are Albania; Austria; Belgium; Bulgaria; Croatia; Cyprus; Czech Republic; Denmark; Estonia; Finland; France; Germany; Greece; Hungary; Iceland; Ireland; Italy; Kosovo; Latvia; Lithuania; Luxembourg; Macedonia; Malta; Montenegro; Netherlands; Norway; Poland; Portugal; Romania; Serbia; Slovakia; Slovenia; Spain; Sweden; Turkey and UK.

[26] The hill shape can be seen in the Appendix without controls in the EQLS for feeling left-out or tense but not for the other seven variables.

Table 14
Summary of mid-life Maxima.

	Without controls	With controls
Table 3		
Not good mental health days	42	35
Table 5		
Depression	50	46
Worry	38	41
Sadness	51	47
Pain	69	53
Table 6		
Stress	43	44
Worry	58	56
Table 7		
Depression & bad nerves	35	43
Phobia and panics	45	
Table 8		
Lost much sleep over worry	51	51
Feeling unhappy and depressed	52	51
Losing confidence	50	47
Couldn't overcome difficulties	48	44
Constantly under stain	41	43
Thinking yourself a worthless person	55	53
Table 9		
Anxiety	40	44
Table 10		
Anxious		48
Feel failure		45
Life getting worse		56
Table 11		
Lonely		63
Sad		57
Depressed		57
Restless sleep		59
Table 12		
Short sleep	40	40
Table 13		
Lonely		58
Downhearted		55
Left out		54
Tense		41
Average	47.7	49.1

3. Discussion

There appears to be a midlife crisis where unhappiness reaches a peak in mid-life in the late forties across Europe and the United States. That matches the evidence for a nadir in happiness that reaches a low in the late forties also (Blanchflower, 2020a). In that paper it was found that, averaging across 257 individual country estimates from developing countries gave an age minimum of 48.2 for well-being and doing the same across the 187 country estimates for advanced countries gives a similar minimum of 47.2.

Table 14 summarizes the results obtained by solving out the age at which the quadratic fitted to the data reaches a maximum. There are sixteen without controls that average at 47.4 and twenty-eight with controls with the maxima averaging out to 49.1, and 48.6 years overall for the forty-four estimates. This is very close to the finding in Blanchflower (2020a) that the U-shape in happiness data averaged 47.2 in developed countries and 48.2 in developing. The conclusion is therefore that data on unhappiness and happiness are highly consistent at the age when the low point or zenith in well-being occurs.

I add to the growing list of unhappiness variables that have hump shapes in age with or without controls. I find a broadly similar hill or hump shaped curve in twenty measures of unhappiness including being *many not good mental health days; being stressed, unhappy; anxious, sad, sleepless; lonely; tired; depressed, tense, under strain*; having *bad nerves; phobias* and *panics* and being in *pain*, feeling *left out of society* and several more. I also found the hump shape for a more general measure relating to the respondent's belief that the country 'is getting worse'. It doesn't seem to matter much how the question about unhappiness is phrased or coded or which country the question is asked or when we get similar results.

A referee has noted that if you look at the graphs, you see wave-like patterns (sadness, panics), hump-shaped patterns (sleep, stress), and increasing-to-a-plateau-like patterns (pain and worry with limited controls). No matter the exact shape of the plots in the various charts, it is clear that there is a peak somewhere in mid-life. I don't claim the patterns are all identical, but their broad similarity is striking, with a peak in prime age. There is a clear consistent pattern in the unhappiness and age data.

Blanchflower and Graham (2020) showed that the drop in measured happiness from youth to the mid-point low of the U-shape is quantitatively large and was not "trivial" as some psychologists have claimed. Indeed, they show the decline in well-being was about the equivalent of that observed from losing a spouse or a job. The results on unhappiness are similar. For example, in the Gallup USDTP averaged across the years 2008–2017 the probability of depression in the raw data rose from 12% at age 18 to 21% at age 58. The proportion of the employed who were depressed was 12% versus 24% for the unemployed. In addition, 12% of the married were depressed yesterday versus 19% of the widowed. In the raw data from the BRFSS the proportion who said they had 20 or more bad days in a month was 6.6% at age 18 and 8.4 at age 47, the peak. Among the married the rate was 5.5% versus 8% for the widowed. The rise in unhappiness to the mid-life peak, is thus large and comparable in magnitude to major life events.

So, what is going on in mid-life? In Blanchflower and Oswald (2008) we suggested three possibilities. First, that individuals learn to adapt to their strengths and weaknesses, and in mid-life quell their infeasible aspirations. Second, it could be that cheerful people live systematically longer than the miserable, and that the nadir in happiness in mid-life thus traces out in part a selection effect. A third is that a kind of comparison process is at work: I have seen school-friends die and come eventually to value my blessings during my remaining years. Stone et al. (2010) suggest that "*it is plausible that wellbeing improves when children leave home, given reduced levels of family conflict and financial burden*" (p.9986, 2010).

The finding of a nadir in well-being in midlife likely adds important support to the notion that the prime-aged, and especially those with less education, are especially vulnerable to disadvantages and shocks.[27] The global Covid-19 pandemic, which is disproportionately impacting marginal workers will likely make matters even harder to deal with for many at a well-being low point (Bell and Blanchflower, 2020). Some especially defenseless individuals might face downward spirals as age and life circumstances interact. Many will not be getting the social/emotional support they need as they are isolated and lonely, in addition to the first-order effects of whatever they are coping with in normal times. Lack of health care coverage in the US may well be a compounding factor where there is also an obesity epidemic. A midlife low is tough and made much harder when combined with a deep downturn and a slow and weak recovery. Peak unhappiness occurs in mid-life. There is an unhappiness curve.

Declaration of Competing Interest

None

Appendix A. Results without controls, ESS and EQLS

Table A1, Table A2, Table A3.

Table A1
ESS – includes country and wave dummies.

	Anxious	Feel a failure	Life getting worse
Age 20–29	.0386 (3.28)	−0.0413 (2.40)	.0646 (4.09)
Age 30–39	.0593 (5.14)	0.0071 (0.42)	.1254 (8.08)
Age 40–49	.0852 (7.46)	0.0048 (0.29)	.2015 (13.13)
Age 50–59	.1091 (9.52)	0.0092 (0.55)	.2591 (16.82)
Age 60–69	.1059 (9.10)	−0.0724 (4.26)	.2837 (18.15)
Age 70–79	.1630 (13.25)	−0.1077 (5.99)	.2868 (17.37)
Age >=80	.1561 (10.44)	−0.1770 (8.09)	.2716 (13.51)
Adjusted R^2	.1314	.1054	.2307
N	93,221	93,181	92,382

Table A2
ESS – includes country and wave dummies.

	Lonely	Sad	Depressed	Restless sleep
Age 20–29	.0291 (2.90)	0.0006 (0.06)	0.0228 (2.40)	.0861 (7.29)
Age 30–39	−0.0028 (0.29)	0.0034 (0.37)	0.0350 (3.75)	.1202 (10.38)
Age 40–49	.0161 (1.66)	.0455 (4.92)	0.0735 (7.95)	.1553 (13.54)
Age 50–59	.0554 (5.70)	.0832 (8.98)	0.1142 (12.34)	.2456 (21.39)
Age 60–69	0.0853 (8.67)	.0933 (9.96)	0.1098 (11.73)	.2671 (23.00)
Age 70–79	.2103 (20.20)	.1717 (17.33)	0.1874 (18.91)	.3494 (28.47)
Age >=80	.4035 (32.37)	.2566 (21.61)	0.2657 (22.36)	.3713 (25.26)
Adjusted R^2	.0668	.0808	.0713	.0350
N	133,007	132,993	132,968	133,303

[27] I am grateful to Jonathan Rauch for these suggestions that he says create a 'toxic brew'.

Table A3
EQLS – includes country and wave dummies.

	Lonely	Down & depressed	Left out	Tense
Age 20–29	.0907 (2.78)	0.1443 (4.61)	.0463 (2.28)	0.0924 (2.28)
Age 30–39	.1223 (3.79)	0.2250 (7.27)	.1022 (5.11)	0.2039 (5.11)
Age 40–49	.1789 (5.57)	0.2946 (9.55)	.1278 (6.40)	0.2473 (6.40)
Age 50–59	0.2435 (7.58)	0.3586 (1.63)	.1526 (7.63)	0.2269 (7.63)
Age 60–69	0.2239 (6.95)	0.2909 (9.40)	.1210 (6.03)	−0.0073 (6.03)
Age 70–79	0.4766 (14.39)	0.4597 (4.46)	.1917 (9.27)	0.0020 (9.27)
Adjusted R^2	.0641	.0727	.0597	.0534
N	80,026	79,916	115,305	79,976

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