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Native Americans' experience of chronic distress in the USA

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Abstract

Over ten million Native Americans live in the USA today, but their experiences are often obscured in empirical research. While the rise in despair, or *chronic distress*, among White Americans is much discussed, what is not discussed is what has happened for the first Americans. We demonstrate that levels of consistently poor mental health were higher among Native peoples than among White or Black Americans in every year between 1993 and 2020, and these levels have been rising. We find this pattern among those over the age of 30 but less so for the young. Chronic distress seems to be lowest among Native peoples living in the seven states with the largest proportion of Native Americans as a fraction of their population: Alaska, Arizona, Montana, New Mexico, North Dakota, Oklahoma and South Dakota. In our judgment, these facts are important and not widely known. This stands in stark contrast to the enormous scholarly and media interest in declining physiological well-being among White Americans.

Keywords Despair · Mental health · Native Americans · Indigenous peoples · Unemployment

JEL Classification I14 · J15 · J71 · Social sciences · economic sciences

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1 Introduction

Modern research has documented rising despair and declining psychological well-being among large sections of the US population. A particular focus has been low-education White Americans. Some of this important empirical work has documented deaths caused by opioids and suicide.[1] A further group of writings has concentrated on measures of psychological ill-health and indirect markers of distress (Cherlin 2018; Gaydosh et al. 2019; Goldman et al. 2018; Glei and Weinstein 2019; Graham 2017; Muennig et al. 2018; Graham et al. 2018).

This paper focuses on a different, and routinely excluded, group of men and women: Native Americans. In 2019, there were just over four million citizens who identified solely as Native American and nearly seven million in combination with one or more races (Appendix Table 13). Yet their experiences are rarely included in work by economists and social scientists (Ferguson 2016; Falleti 2020). As one example, a search on "Native Americans" on the entire history of the Web of Science produces 47 journal articles that are categorized as Economics. The total number of published articles in the Web of Science categorized as Economics is approximately 700,000. A search on the simple term "Americans" produces approximately 16,000 articles in Economics.

This lack of literature among social scientists is somewhat perplexing. Despite the general emphasis on deaths of despair among White Americans, Shiels et al. (2017) has shown that between 1999 and 2016, premature mortality among Native Americans increased at almost twice the rate of White Americans, with the primary causes being due to "deaths of despair" such as drug poisonings, chronic liver disease and suicide. Woolf et al. (2018) confirm the increase in premature deaths during midlife from similar causes for the same period. Han et al. (2021) show that non-Hispanic American Indian or Alaska Natives had the highest rates of increase for methamphetamine overdose in the USA for the period 2011–2018, rising from 5.6 to 26.4 per 100,000 among men and from 3.6 to 15.6 for women. Non-Hispanic white men saw increases from 2.2 to 12.6 and white women from 1.1 to 6.2, with all the other racial gender groups having lower rates. Spillane et al. found that from 2000to 2016 the age-standardized rate of alcohol-induced deaths among Natives was markedly higher than for any other race or ethnicity (Spillane et al. 2020). The largest increase in the rate of alcohol-induced deaths was observed among American Indian and Alaska Native men (3.3%) and women (4.2%) versus 1.4% and 3.1% overall. Recent data also show that suicide rates have been highest among Native peoples (Curtin and Hedegaard 2019), and drug poisoning deaths per 100,000 population in 2019 were higher among Native people than any other group.[2]

[1] See, for example, Case and Deaton (2015, 2017), Meara and Skinner (2015), Roux (2017), Shanahan et al. (2019) and Stein et al. (2017).

[2] Miniño and Hedegaard (2021) report that the age-adjusted overdose death rates in 2019 were 21.6 for all races; 30.5 for Non-Hispanic American Indian or Alaska Natives; 26.2 for Non-Hispanic whites; 24.8 for Non-Hispanic Blacks; 3.3 for Non-Hispanic Asians; 9.5 for Non-Hispanic Native Hawaiian or Other Pacific Islanders and 12.7 for Hispanics. In the last two years of data available, CDC data suggest suicide rates have been increasing for Native peoples.

These differences are long standing (Tower 1989; Christian et al. 1989; Jones 2006) but may be worsening: Best et al. (2018) estimates that from 2017 to 2030, all-cause premature death rates among Native Americans and Alaska natives will increase by 10%. However, to our knowledge, a simultaneous rise in physiological pressures that may drive these trends in deaths of despair among Native people and the economic forces that may underlie them has not been demonstrated in the literature. This is the primary contribution of this paper.[3]

We draw upon a mixture of economic and psychological data and create a measure of persistent, or chronically poor, mental health, which we call chronic distress, and then chart its level through time among particular groups of US citizens and its association with economic factors. To allow comparisons with modern research on White and Black Americans, we pool data from 27 years of the Behavioral Risk Factor Surveillance System (BRFSS) survey organized by the Centers for Disease Control and also use recent information available from surveys organized by the Gallup Corporation. These data are most comprehensive survey data available on the mental well-being of Native Americans in the USA.

Our primary measure of *chronic distress*, following Blanchflower and Oswald (2020), is whether someone reported that all 30 days out of the last 30 that their mental health was not good, including stress, depression and problems with emotions. We use this term given recent evidence of the long-run consequences of chronic physical and mental pain (Blanchflower and Bryson 2022, 2021). This definition differs from that used by Gagné et al. (2021) who used 15 days or more out of 30; however, we show below that regardless of the precise cutoff of 15 days or later, Native Americans face consistently higher rates of distress past. Obviously, this measure of chronic distress is not the directly the same as "despair" popularized by the work of Case and Deaton (2015, 2017). Shanahan et al. (2019) note that the deaths of despair literature "*has neither defined nor empirically assessed its central concept, despair" and argue that it requires "multidimensional conceptual mapping*" (p. 854). We view the measure used here and grounded in the work of Blanchflower and Oswald (2020) as part of this mapping. While the concept of despair arguably implies something subtle about expectations of the future and our question focuses on experiences in the present, it is plausible that current, persistent feelings of distress will impact beliefs and expectations of the future. This measure, meaningful in its own right, thus also captures some dimensions of the experience of despair, even if imperfectly.

We show that the upward trend in chronically poor mental health among Native Americans is more pronounced than for White Americans. Those who are classified by the BRFSS as "other race" have seen a similar rise. This general increase of chronic distress among Native Americans during the 1990s and 2000s may be surprising given the large increase in economic opportunities provided by on-reservation Casino gaming during that period. The literature on the rise of casino gaming

[3] The current paper might also be seen as a contribution in the spirit of recent work by Muennig et al. (2018), although that study was not able to include information on Native Americans, Graham and Pinto (2019) and Pescosolido et al. (2020).

has found it has had significant positive effects for the regions and people it affects, both physiologically and materially (Akee et al. 2010; Evans and Topoleski 2002).[4] We will be unable to answer whether the upward trend in distress exists primarily for Native peoples in, near,or outside of reservations given limited data on small-area geography. However, less than half of Native peoples live on reservations, so the patterns we observe may be due to people outside of regions that experienced income gains due to gaming (Akee and Taylor 2014). A prior literature has documented differences in the economic conditions and health conditions of Native Americans (Gracey and King 2009; Walls and Whitbeck 2011; Barnes et al. 2010). However, to our knowledge, the widening and consistently high levels of chronic distress in the latest era have never been shown previously, nor their correlation with local economic change.

This paper is not intended as part of a so-called deficit narrative (Tuck 2009) nor to diminish the successes of many Native Nations.[5] Rather, it is an attempt to constructively refocus research and policy conversations to understand the social forces that have resulted in the rise in distress by highlighting the fact that White Americans are not the most intensely affected. We also provide evidence on what factors may mitigate chronic distress for Native peoples: we offer evidence that US states with largest proportion of Native Americans as a fraction of their population exhibit lower levels of extreme distress.[6]

2 Background and data

We make use of data from two main sources. First, we pool twenty-seven years of 1993–2019 annual survey data files from the CDC's Behavioral Risk Factor Surveillance System (BRFSS).[7] Second, we examine information from the Gallup Daily Tracker Polls of 2017 and 2018. We focus on these two surveys specifically because they are the only nationally representative, large publicly available data sets in the USA that separately identifies Native American respondents and also has information on mental health. It is important to note that both of these data sets only allow us to identify Native Americans who claim only Native American racial identities. Native Americans who report multiple identities are classified as "other race" or "multi-race" along with all other racial groups reporting multiple identities or a race other than White, Black, Asian, or Native American. In addition, these data are cross-sectional and do not allow for linking individuals over time.

The primary data we use are taken from the Behavioral Risk Factor Surveillance System (BRFSS) from 1993 to 2020: there are 9,089,155 observations. Information

[4] However, gaming is associated with increased crime rates (Grinols and Mustard 2006).

[5] See, for example, the *Honoring Nations* reports and case studies from the Harvard Project on American Indian Economic Development: https://hpaied.org/publications-and-research. Last accessed November 4, 2021.

[6] The pattern is consistent with recent work by Graham and Pinto (2019), who demonstrate that minority populations have better mental health in regions with larger, more firmly established cultural communities.

[7] There are 18,318 observations from the first part of 2020 in the 2019 survey.

in the survey is collected monthly, by telephone, with a standardized questionnaire for the Center for Disease Control (CDC). The Behavioral Risk Factor Surveillance System (BRFSS) is the nation's premier system of health-related telephone surveys that collect state data about US residents regarding their health-related risk behaviors, chronic health conditions and use of preventive services. Established in 1984 with 15 states, BRFSS now collects data in all 50 states as well as the District of Columbia and three US territories. BRFSS completes more than 400,000 adult interviews each year, making it the largest continuously conducted health survey system in the world.[8] The CDC regularly publishes nationally representative estimates for the fifty states in its Morbidity and Mortality Weekly reports, for example see Gamble et al (2017)

In the BRFSS sample, we have 136,125 Native American observations on despair once missing values are omitted, which is 1.02% of the sample of 9,089,155. This is a higher proportion than suggested by Census Bureau estimates, including children. Based upon the 2019 American Community Survey, the Census Bureau estimates that there are 2,847,336 American Indians and Alaskan Natives out of a population including children, of 328,239,523 or 0.87%.[9] The percentage of Native respondents in the BRFSS stays relatively constant over time: 0.86% in 1993–1997, 0.99% in 1998–2002, 1.04% in 2003–2007, 1.05% in 2008–2012, 0.98% in 2013–2017 and 1.2% 2018–2021 with potentially a slight rise. This is potentially relevant since the number of people identifying as Native American in surveys such as the Census has been increasing over time.[10] We discuss this issue in more detail when discussing our results.

The BRFSS question we use is the following: *"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?"* We code people who give the answer "*30 days out of 30"* as being in extreme distress. We make use of data files from 1993 because that is the year a key question on "bad mental-health days" was first asked. Sample sizes increased from around 100,000 annually in 1993 to 450,000 by the end of the years. We also make use of data on various well-being measures from the Gallup US Daily Tracker polls of 2017 and 2018.

Table 1 reports the weighted distribution of responses to the question by five non-Hispanic groups—White, Black, Asian/Pacific Islanders, Native Americans and those identified in the BRFSS as "other race," plus Hispanics. We present the

[8] Details of the weighting schemes in the BRFSS are provided in The BRFSS Data User Guide August 15, 2013: https://www.cdc.gov/brfss/data_documentation/pdf/UserguideJune2013.pdf. Last accessed November 4th, 2021.

[9] See https://data.census.gov/cedsci/table?q=race%20demographics&tid=ACSDP1Y2019.DP05. Last Accessed October 30, 2021.

[10] The US Census Bureau has also traditionally undercounted the number of Native peoples accounting for part of the increase in the population reported in the Census (Liebler and Ortyl 2014). In the 2010 Census, American Indians and Alaska Natives living on reservations were undercounted by 4.9 percent, while they were undercounted in 1990 by 12.2 percent (Connolly and Jacobs 2020), but the increase in the population between these years was over one million people (Liebler and Ortyl 2014), which is substantially more than could be attributed to this under count.

data for the full sample of respondents for all years of data, from 1993 to 2021. The percentages presented in the first row show two-thirds of respondents answer that zero of the past thirty days have they experienced "not good" mental health. The percentage is below sixty for Native Americans and other races. However, it is also clear from the second to last row of Table 1, that the percentage of people responding that their mental health was "not good" all thirty of the previous thirty days is especially high among Natives.

Table 2 reports the rate of chronic distress of the weighted samples by racial group. It averages 5.1% over the period 1993–2020 and is higher among Native people overall, as well as for those with no or some college education with the distress markedly higher in the former case (10.4%) than in the latter (7.8%). The same is true for the prime age (35–54) and especially so for the prime age without any college education. As we will show below the gap between natives and other groups has increased over time for the less educated.

Table 3 shows changes in extreme distress over time. It is notable that for Native Americans the percentage reaches double figures after the Great Recession and stays there subsequently. There are increases over time for all groups, with the smallest increase for Hispanics.

Table 1 Distribution of bad mental health days, 1993–2021

	White	Black	Asian	Native	Hispanic	Other	All
0	66.1	65.2	69.7	59.7	65.9	59.0	66.0
1	3.6	3.1	3.8	3.0	3.2	3.5	3.5
2	5.8	5.0	5.8	5.2	5.0	5.5	5.6
3	3.3	3.3	3.4	3.1	3.6	3.5	3.3
4–9	8.0	8.1	8.2	8.4	8.3	9.0	8.0
10–19	6.0	6.8	4.7	7.6	6.3	8.0	6.1
20–29	2.2	2.7	1.7	3.6	2.5	3.5	2.3
30	4.9	6.0	2.6	9.3	5.3	8.1	5.1
Mean	3.1	3.6	2.2	4.8	3.3	4.5	3.2
N	6,802,073	697,296	197,411	122,971	656,613	203,763	8790,218

Shown are weighted percentages

Table 2 Distribution of chronic distress by race, 1993–2021

	All	HS Dropout	HS graduates	Some college	College	Age 35–54 HS dropout
White	4.9	9.9	5.7	5.1	2.6	14.6
Black	6.0	9.5	6.1	5.7	3.5	12.4
Asian	2.6	5.2	3.6	3.4	1.7	5.3
Native	9.3	14.2	8.2	9.2	5.6	18.4
Hispanic	5.3	6.0	5.1	5.2	3.9	6.3
Other	7.1	12.4	8.1	8.6	5.1	14.9

Shown are weighted percentages

Table 3 Time-series changes in despair by race, 1993–2021

	1993–1997	1998–2002	2003–2007	2008–2012	2013–2017	2018–2021
White	3.9	4.3	4.6	5.1	5.6	6.2
Black	4.9	5.5	5.9	6.3	6.4	6.6
Asian	2.5	2.3	2.6	2.3	2.8	2.9
Native	7.2	7.5	9.3	10.2	10.3	10.2
Other race	5.7	7.2	7.8	8.5	8.9	8.3
Hispanic	5.6	7.1	4.8	5.5	7.3	5.8

Shown are percentage point changes over the indicated periods

3 Econometric results

The paper's principal analytical findings are reported in time-series plots in Figs. 1–3 and in regression equations in Tables 4–9 using the BRFSS 1993–2021. We add to that supporting evidence from Gallup's US Daily Tracker polls of 2017 and 2018 in Tables 9–11. Our principal finding is that Natives have higher levels of chronic distress than whites, blacks, Hispanics and Asians controlling for a host of variables as well as cohort and income. We also find they have lower levels of general health as well as higher numbers of bad *physical* health days.

Figure 1 uses the full-sample data from 1993 to 2021. The graph separates citizens into five non-Hispanic racial groups—Whites, Blacks, Asians and Pacific

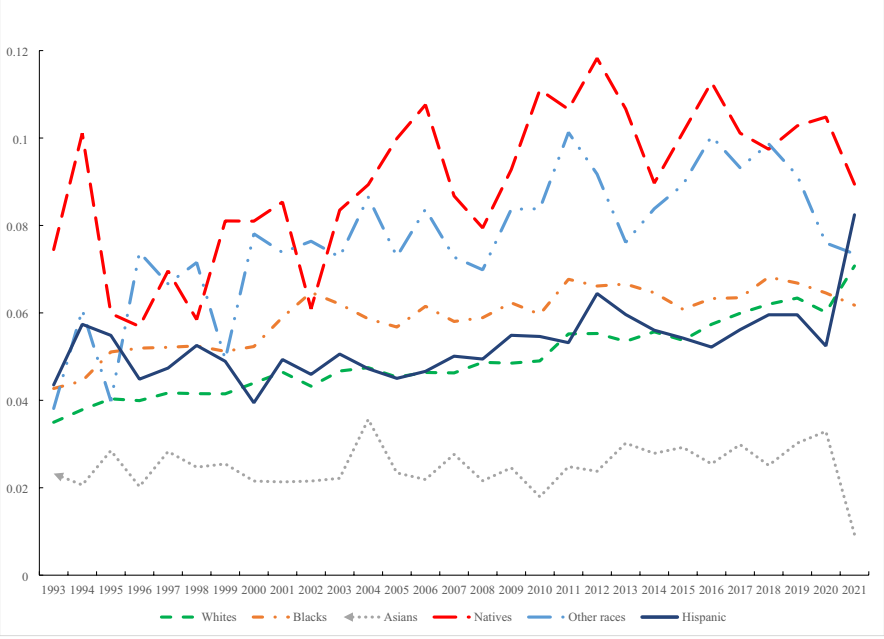

Fig. 1 The incidence of chronic distress by race, 1993–2021

Table 4 Chronic distress equations, 1993–2021

	1993–2021	1993–2021	1993–2000	2001–2021
Native	0.037 (58.72)	0.010 (15.45)	0.009 (4.69)	0.010 (14.34)
Other race	0.035 (68.27)	0.019 (37.34)	0.013 (4.96)	0.019 (36.02)
Black	0.006 (19.55)	-0.017 (55.76)	-0.009 (10.97)	-0.018 (55.08)
Asian	-0.018 (31.97)	-0.012 (22.69)	-0.008 (5.34)	-0.013 (22.35)
Hispanic	0.007 (20.47)	-0.011 (32.96)	-0.002 (2.39)	-0.012 (33.77)
Male	-0.016 (102.21)	-0.012 (68.01)	-0.012 (27.49)	-0.010 (59.14)
Age	0.003 (101.59)	0.002 (71.18)	0.002 (19.90)	0.002 (66.02)
Age^2*100	-0.003 (115.21)	-0.003 (94.96)	-0.002 (24.00)	-0.003 (75.29)
Cellphone survey	0.007 (28.45)	0.005 (21.26)	n/a	0.005 (19.48)
Personal controls	No	Yes	Yes	Yes
Constant	-0.078	-0.041	0.009	-0.026
Adjusted R^2	0.007	0.056	0.038	0.058
N	8,788,856	8,776,554	1,053,6982	7,722,856
Age maximum	46	38	39	38

t-statistics in parentheses. All equations include state and year dummies. Personal controls include education, labor force and marital status. Sample includes Guam, Puerto Rico and the Virgin Islands. Categories of other and refused also included but not reported. Ordinary Least Squares equations. Extreme distress is measured as those who give the answer 30 to the BRFSS question, *"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?"* BRFSS 1993–2021

Islanders, Native Americans, those identified as "other race," plus Hispanics. Perhaps the most striking feature of Fig. 1 is that chronic distress is far greater among Native peoples and other races, and the gap has risen over time. By 2019, one in eight Native American citizens said that every day of the last month was a bad day for mental health. The proportion was far above the incidence observed among Whites or Blacks. The small differences in distress between White and Black Americans are consistent with the existing literature on mental health and stress in these populations: Despite the socioeconomic and historical differences between the two groups, black Americans have relatively comparable or better good mental health than White Americans (Neighbors et al. 1983; Riolo et al. 2005; Keyes 2009, Erving et al. 2019). As we note below once controls are included for education or labor market status Blacks have significantly lower levels of persistently poor mental health than Whites.

Figure 2 depicts equivalent data for subsample of individuals much discussed in the literature on despair, namely those without a college education. The graph reveals a broadly similar pattern to that of Fig. 1. Once again, chronic distress is markedly higher for Native Americans, and there is a secular trend upwards for Black, White, Native and other race Americans but the series is flat for Hispanic and Asian Americans. A particularly sharp rate of increase is visible among less-educated Native Americans and other races. By the year 2019, Fig. 2 shows that approximately one in eight exhibited persistently poor mental health. Figure 3 turns to US citizens with college education, and again, the incidence of persistently poor

mental health is markedly higher among Native peoples and other races who have seen a rise in the incidence of extreme distress. The rise is much less marked for the other groups.

Figures 1–3 demonstrate a consistently high large difference between the proportion of Native people experiencing chronic distress and a general rise in over time.[11] Given the shifts in who identifies as Native American over time,[12] how to interpret the rise in persistently poor mental health is an open question: is the rise in distress as due to an increase among people who would have always identified Native or due to people who have more recently connect with their Native ancestry being more likely to have chronically poor mental health? We believe that the former interpretation is more likely than the later for at least two reasons. First, we focus on Native Americans who report only a single race and those that report a different race between censuses are much more likely to have multi-racial identities so are more likely to end up in the other race category in the BBRFS then the sole Native American racial identity category (Liebler et al. 2016). Second, proportionately, highly educated adults are more likely to report being Native American when they had not done so previously (Liebler and Ortyl 2014), and much of the growth in the Native population in the past decade has been among older cohorts (seeAppendix Table 13 and Liebler and Ortyl (2014)).

If, on average, individuals who experience chronic distress than the Native population in the 1990s begin to enter the Native population category in survey data, trends in distress will potentially underestimate any rise in chronic distress among Native people who would always identify as Native. Since both the more highly educated and those over the age of 64 experience less chronic distress on average, we would expect changes in identification would mitigate the rise observed among Native Americans.

From Fig. 3, we can see that those with at least some college have a slightly flatter trend among Native people than those with less education, possibly suggesting the upward trends are muted if there is greater ethnic mobility among the more highly educated. However, regardless of how the trends are interpreted, those who historically and currently identify as Native American have greater levels of average chronic distress than White Americans.

The time-series graphs in Figs. 1–3 simply plot the raw data through time. Thus, they do not correct for the potentially different characteristics of different groups of individuals (as shown in Tables 4–8). A first form of such adjustment is provided in Table 4. Here we present results of estimating pooled cross-section time-series

[11] Due to small sample sizes in 2020 in these figures combine 2020 data with 2019.

[12] Moreover, in the 2000 Census a million people reported race as Native American but did not report that race in the 1990 Census according to estimates by Liebler and Ortyl (2014). In addition, this rise cannot be solely due to changing identity options in the Census: the number of people identifying as Native American increased between 2000 and 2010 above birth and death rates despite fixed Census questions on race (Liebler and Ortyl 2014; Liebler et al. 2016). Some have suggested that part of the rise of people identifying as Native American is at least in part due to the political mobilization of Native Americans during the 1960s and 1970s and associated pride movements, which may have resulted in less stigma associated with being identified as Native (Thornton 1997; Sturm 2011; and Nagel 2020).

regression equations with the dependent variable being a dummy variable for whether a respondent reported thirty of the last thirty days were bad mental health days. Sample size is 8.8 million. Each specification includes dummy variables for Native, Black, Asians/Pacific Islander and Hispanic people as well as for those classified as "other race" with the base category being White. A quadratic in age is included, plus a dummy variable for gender and a dummy variable for whether the survey was taken using a cellphone.[13] We present the coefficients on each of these variables with and without controlling personal circumstance and characteristic variables.

In the first column, the coefficient of the Native and "other race" variables is around 0.037 in both cases, suggesting that Native peoples and those who race is not captured in the main race categories of the BRFSS have a 3.7 percentage point higher rate of chronic distress conditional on age, gender and method the survey was taken. The second column adjusts for a set of controls for labor-market status, level of education, marital status and state and year dummy variables. Because of the large sample sizes in Table 4, the coefficients are estimated precisely with t-statistics for the overall sample that typically exceed 50. In the second column of Table 4, the highly statistically significant coefficient on Native Americans is 0.0096 with a t-statistic of more than 15. As the base category is Whites, this implies that after adjustment for the independent variables the level of extreme distress is approximately 1 percentage point higher among Native Americans than among White Americans. The coefficients on the Black and Hispanic variables both switch sign to significantly negative in column 2 from positive in column 1: Asians are negative in both columns. In columns three and four, the equations are re-estimated for the earlier period 1993–2000 and then for 2001–2021, and both the Native and other race coefficients rise slightly.

An important implication emerges from Table 4. In Table 1 and Fig. 1, it was seen that the raw gap between Native Americans and Whites in the incidence of chronically poor mental well-being was slightly over 4 percentage points (that is, comparing 9.3% with 4.9%). Yet in the adjusted estimates of Table 4 it is only 1 percentage point. This implies that the majority of the raw difference is accounted for by the different underlying circumstances of Natives when compared to Whites. If Native Americans had the same economic and social circumstances as White Americans, the solid line in Fig. 1 would in principle lie only slightly above the two dotted lines for other American citizens.

[13] The 2011 survey saw a change in weighting methodology and the addition of cell-phone-only respondents, because an increasing number of US citizens were known to be using cell phones. Evaluations conducted by Centers for Disease Control using 2010 and 2011 BRFSS data indicate that the addition of cellular-telephone-only households improves survey coverage for certain population groups. For example, it was found that the proportion of interviews conducted with respondents with lower incomes, lower educational levels, or are in younger age groups increases, because these groups more often exclusively rely on cellular telephones for personal communications. We include the cellphone indicator to account for any changes or systematic differences between those that us a cellphone and those that do not that may be corrected with race and extreme distress.

Table 5 Chronic distress equations with cohort effects, 1993–2021

	(1)	(2)
Native	0.037 (58.66)	0.010 (15.46)
Other race	0.035 (67.99)	0.019 (37.21)
Black	0.006 (19.46)	-0.017 (55.69)
Asians/Pacific Islander	-0.018 (32.03)	-0.0135 (22.85)
Hispanic	0.007 (20.88)	-0.011 (32.78)
Male	-0.016 (102.15)	-0.011 (67.91)
Age	0.003 (62.62)	0.003 (50.97)
Age^2* 100	-0.003 (77.47)	-0.003 (73.10)
Cellphone survey	0.006 (22.34)	0.004 (17.31)
Cohort dummies (8)	Yes	Yes
Personal controls	No	Yes
Constant	-0.087	-0.049
Adjusted R^2	0.008	0.056
N	8,788,856	8,776,554
Age maximum	48	41

t-statistics in parentheses. All equations include state and year dummies; personal controls include education, labor force and marital status. Ordinary Least Squares equations. BRFSS 1993–2021

We have also varied our definition of chronic distress as a robustness exercise. Below we report the coefficients and t-values on the Native American variable using the specification in column 2 of Table 4 with personal controls. We vary the number of days so that half of the days are counted as not good mental health days. We then do so another four times as a smaller proportion of the 30 days are included as despair. The results tightly cluster around a coefficient of 0.1 so it appears that our results are largely insensitive to changes in definition.[14]

Table 5 repeats the same econometric exercise but adds decade-of-birth cohort dummy variables with the full sample. It does this to try to probe whether successive generations of Native people are enduring lower or higher rates of chronic distress (with no personal controls in column 1 and with them in column 2). The results are largely unchanged, which suggests that any general cohort effects in mental well-being do not explain why Native peoples have higher rates of chronic distress on average. Table 6 does a further check on a sample from 1993 to 2021 by adding income controls. Column 1 presents the results with and without personal controls. Again, Native Americans have significantly higher rates of chronic distress than all other groups. In both of these tables, there is a hump-shaped age pattern (plotted

[14] The results are as follows: for 15–30 days:0.0084 (9.96); 20–30 days: 0.0098 (13.14); 25–30 days: 0.0097 (14.30); 28–30 days: 0.0100 (15.53); 29–30 days: 0.0099 (15.37); and finally, 30 days: 0.0098 (15.29). The coefficients are listed first with the t-statistics in parenthesis.

Table 6 Chronic distress equations with adjustment for household income, 1993–2021

	All	Males	Females
Black	-0.021 (68.03)	-0.015 (32.30)	-0.025 (61.94)
Asians/Pacific Islander	-0.016 (27.28)	-0.010 (12.85)	-0.020 (24.04)
Native	0.004 (6.64)	0.005 (5.28)	0.004 (4.04)
Other race	0.016 (31.65)	0.017 (24.53)	0.015 (21.27)
Hispanic	-0.017 (48.58)	-0.010 (21.50)	-0.021 (45.08)
Male	-0.009 (54.26)	n/a	n/a
Age	0.003 (79.81)	0.002 (36.44)	0.003 (72.45)
Age^2* 100	-0.003 (103.79)	-0.002 (48.88)	-0.004 (93.31)
Cellphone survey	0.004 (15.8)	0.003 (8.35)	0.005 (14.31)
Income dummies	Yes	Yes	Yes
Constant	0.007	0.054	-0.002
Adjusted R^2	0.060	0.057	0.060
N	8,435,620	3,454,717	4,770,821
Age maximum	39	38	40

t-statistics in parentheses. All equations include state and year dummies, education, labor force and marital status and race refused. Ordinary Least Squares equations. BRFSS 2010–2021

Table 7 Chronic distress equations by age, 1993–2021

	Age 18–34	Age 35–54	Age 55–69	Age 70 +
Native	-0.003 (2.14)	0.008 (7.40)	0.015 (12.17)	0.018 (12.13)
Other race	0.016 (15.85)	0.019 (20.92)	0.022 (22.12)	0.014 (13.42)
Black	-0.011 (16.82)	-0.021 (40.66)	-0.022 (38.55)	-0.005 (7.73)
Asian	-0.014 (13.99)	-0.011 (12.03)	-0.010 (7.74)	-0.005 (3.27)
Hispanic	-0.017 (27.51)	-0.013 (23.19)	-0.005 (7.05)	0.005 (5.21)
Male	-0.017 (47.01)	-0.017 (59.01)	-0.009 (28.91)	-0.0002 (0.85)
Cell	0.005 (6.1)	0.008 (16.53)	0.003 (6.16)	-0.0004 (1.02)
Constant	0.005	-0.013	0.056	0.057
Adjusted R^2	0.035	0.082	0.061	0.014
N	1,540,751	2,904,723	2,534,727	1,796,353

t-statistics in parentheses. Equations also include state and year dummies, labor force, marital status and education and a full set of single year of age dummies

in Appendix, Fig. 4), which also holds within each race, consistent with work on representative samples of people in many nations' data, such as recently in Blanchflower (2020, 2021).[15]

Table 7 produces separate estimates for four age groups. There are large positive and significant coefficients for the three age groups: 35–54, 55–69 and 70 + but not for the youngest age-group. For those under thirty, the

[15] The age maxima are simply obtained by differentiating with respect to age and solving so in column 1 of Table 4 the equation is .0535 + .0026Age -.000033Age^2. Differentiating with respect to age gives a maximum of .0026/(2*.000033) = 39.

coefficient is significantly lower than for whites although the coefficients on the Black, Hispanic and Asian race variables are all significantly smaller, that is more negative, than for Natives. The other race variable though is significantly positive as it is for all four age groups and for all four age groups is significantly higher and hence have higher levels of distress than for Natives.[16]

Modern research on despair (captured partially by what we measure here), shaped originally by Case and Deaton's work, has been especially interested in midlife individuals with low levels of education (Case and Deaton 2015, 2017).[17] A commonly discussed hypothesis is that poor employment chances have been an important driver of this growth of chronically poor mental health in the USA. Is that true of Native Americans?

To investigate this, Table 8 moves to a fuller set of regression equations for Native Americans only who constitute 1% of our weighted sample with approximately 130,000 observations. We present four sets of results restricting the sample to be just Native Americans. The first column is for all Native people; then, as we move to the right in column 2 we restrict the sample to high school dropouts, high school graduates and then those with some college. In each column of Table 8, large effect sizes are visible from being out of work, from being unable to work and from a person's level of education. Other background covariates of evident importance in the equations of Table 8 are: being a student, being retired, being divorced or separated, being widowed and being female. All are associated with a higher probability of chronic distress. There is again an inverted U-shape in age maximizing at age 40 consistent with the findings of Blanchflower (2021b).[18]

Finally, extreme distress among less-educated Native peoples is *lowest* in states that have the highest proportion of Natives Americans. We examined which states had the highest percentage of Native Americans in our data file. The seven states that had the greatest proportion of Native peoples among their population, pooled across the years, were: Alaska 13.0% (with *chronic distress 4.4%*); Arizona 2.8% (*7.4%*); Montana 4.5% (*7.0%*); New Mexico 7.4 (*6.9%*); North Dakota 3.6% (*7.1%*); South Dakota 5.4% (*6.7%*); and Oklahoma 6.9% (*8.8%*). Here the numbers in parentheses give the proportions of people who reported being in extreme distress among the least educated, with an overall mean of *10.4%*. Of particular note is the fact that living in one of these states seems to be the most protective for those who are midlife high school dropouts. For example, while living in Alaska

[16] We should be cautious here with the effects over for the oldest age group of seventy and older given Hudomiet et al.'s (2021) finding that there is a mortality selection bias in the USA is happiness data over the age of seventy.

[17] Of note is that Case and Deaton (2020) do not even refer to the experience of Native Americans or American Indians.

[18] Other tests are included in Appendix. Table 15 provides BRFSS chronic distress estimates for different time periods, with the first three columns being without personal controls and the last three columns with them. In each case, the coefficient on the Native variable is significant and positive. In Table 16 we show the same results hold for prime age individuals.

Table 8 Chronic distress equations, 1993–2021, for Natives

	All	HS dropouts	HS graduates	Some college
Alaska	-0.062 (7.59)	-0.083 (3.88)	-0.029 (2.03)	-0.070 (6.28)
Arizona	-0.045 (5.33)	-0.050 (2.21)	-0.009 (0.63)	-0.067 (5.84)
Montana	-0.033 (4.03)	-0.054 (2.50)	0.007 (0.52)	-0.052 (4.76)
New Mexico	-0.035 (4.27)	-0.038 (1.41)	0.001 (0.06)	-0.059 (5.33)
North Dakota	-0.043 (4.74)	-0.056 (2.25)	-0.015 (0.94)	-0.0570 (4.75)
Oklahoma	-0.017 (2.06)	-0.002 (0.11)	0.013 (0.92)	-0.039 (3.57)
South Dakota	-0.047 (5.78)	-0.064 (3.04)	-0.017 (1.18)	-0.058 (5.35)
Age	0.005 (15.31)	0.0060 (7.25)	0.004 (8.75)	0.004 (8.99)
Age^2*100	-0.006 (18.19)	-0.008 (9.16)	-0.005 (10.02)	0.005 (10.97)
Male	-0.017 (10.53)	-0.016 (3.40)	-0.023 (8.51)	0.013 (5.87)
Cellphone survey	0.009 (3.66)	0.016 (2.33)	0.005 (1.29)	0.008 (2.62)
Self-employed	0.011 (3.71)	0.012 (1.23)	0.010 (1.91)	0.011 (2.76)
Out of work ≥ 1 year	0.070 (18.42)	0.065 (6.66)	0.063 (10.75)	0.079 (13.47)
Out of work < 1 year	0.039 (10.88)	0.036 (3.63)	0.028 (5.23)	0.052 (9.55)
Homemaker	0.030 (9.02)	0.051 (6.04)	0.026 (5.00)	0.015 (2.76)
Student	0.020 (4.43)	0.044 (2.75)	0.015 (1.82)	0.017 (3.15)
Retired	0.043 (14.63)	0.056 (6.61)	0.036 (6.88)	0.042 (10.58)
Unable to work	0.174 (67.97)	0.155 (23.13)	0.156 (37.10)	0.206 (53.57)
Education grades 1–8	0.050 (2.70)	-0.049 (2.28)		
Grades 9–11	0.068 (3.74)	-0.073 (3.44)		
Grade 12/GED	0.083 (4.59)			
College 1–3	-0.078 (4.30)			
College 4 +	-0.092 (5.10)			0.012 (5.40)
Divorced	0.032 (14.48)	0.027 (4.15)	0.032 (8.52)	0.030 (10.47)
Widowed	0.028 (9.75)	0.017 (2.41)	0.033 (6.46)	0.030 (7.18)
Separated	0.052 (12.54)	0.040 (3.95)	0.048 (6.98)	0.059 (9.60)
Never married	0.002 (0.69)	-0.016 (2.34)	-0.007 (0.16)	0.002 (0.51)
Living together	0.012 (3.17)	-0.007 (0.61)	0.012 (2.00)	0.016 (3.05)
Constant	0.054	0.042	-0.028	-0.013
Adjusted R^2	0.061	0.061	0.053	0.064
N	130,543	21,980	45,045	63,158
Age maximum	40	39	41	39

t-statistics are in in parentheses. The equations include a full set of state and year dummies and column 3 includes single year of age dummies. Other base categories: employee, Alabama, never attended school/kindergarten; employee; and married. Source: BRFSS

is associated a roughly 6 percentage points lower rate of chronic distress for Native Americans on average relative to the excluded state of Alabama (as seen in column 1), living in Alaska is associated with an 8 percentage point lower rate of chronic distress among other high school dropouts relative to lower proportion population states. This pattern, which is suggestive, is consistent with a feeling of belonging

Table 9 OLS general health and number of bad physical health days, BRFSS, 1993–2021

	General health status		Bad physical health days	
			#days	30/30 bad days
Black	-0.347 (252.00)	-0.142 (110.34)	-0.508 (47.33)	-0.016 (48.26)
Asian	-0.122 (46.66)	-0.173 (71.96)	-0.418 (21.07)	-0.006 (10.03)
Native	-0.481 (163.68)	-0.220 (81.20)	0.678 (30.07)	0.015 (21.20)
Other	-0.311 (130.51)	-0.169 (76.79)	0.841 (46.29)	0.018 (31.37)
Hispanic	-0.480 (314.64)	-0.236 (162.83)	-0.125 (10.39)	-0.005 (12.82)
Male	0.002 (2.59)	-0.037 (53.79)	-0.330 (57.76)	0.003 (18.01)
Cellphone survey	-0.054 (45.33)	-0.031 (29.15)	0.173 (20.11)	0.005 (18.65)
Personal controls	No	Yes	Yes	Yes
Constant	3.9346	3.9461	-0.2853	0.0095
Adjusted R^2	0.080	0.224	0.170	0.116
N	9,057,768	9,045,101	8,746,011	8,746,011

t-statistics in parentheses. All equations include year and state dummies and single year of age dummies. Personal controls include education, labor force and marital status. Equations also include race-refused category. General health status 1 "poor," 2 "fair," 3 "good," 4 "very good," 5 "excellent."

or importance of being culturally connected to a community being psychologically protective.[19,20]

Table 9 reports equations using two other variables from BRFSS: Q2–Q3, relating to general health and the number of days in the past thirty when their physical health was not good. The questions used were as follows:

> *Q2. Would you say that in general your health is — excellent (5; very good (4); good (3); fair (2) or poor (1)? With our coding in parentheses.*
> *Q3. Now thinking about your physical health, which includes physical illness and injury, for how many days during the past 30 days was your physical health not good?*

The results are similar to those using chronic distress. Natives have poorer general health and have a higher number of bad physical health days, plus are more likely to say that *every* day is a bad physical health day than whites, Blacks, Hispanics and Asians, and other groups. Separate results are provided with limited controls and then adding personal controls for education, labor force and marital status. This is consistent with results reported inAppendix Table 14 based on

[19] Marmaros and Sacerdote (2006) find, in a study of Dartmouth student and recent alumni interactions, that physical proximity and racial similarity have positive impacts on whether students interact with each other. Pescosolido et al. (2020) show for some minority populations being around a larger community results in better outcomes. Also see Mayer and Puller (2008) and Hill (2009),

[20] A stronger test of this would be to examine how chronic distress varies for those within a tribal statistical area and those living outside of these areas. Unfortunately, we do not have the geographic information to do this. In addition, it is difficult to draw any strong conclusions about the role of reservations in this story due to the absence of directly comparable literature.

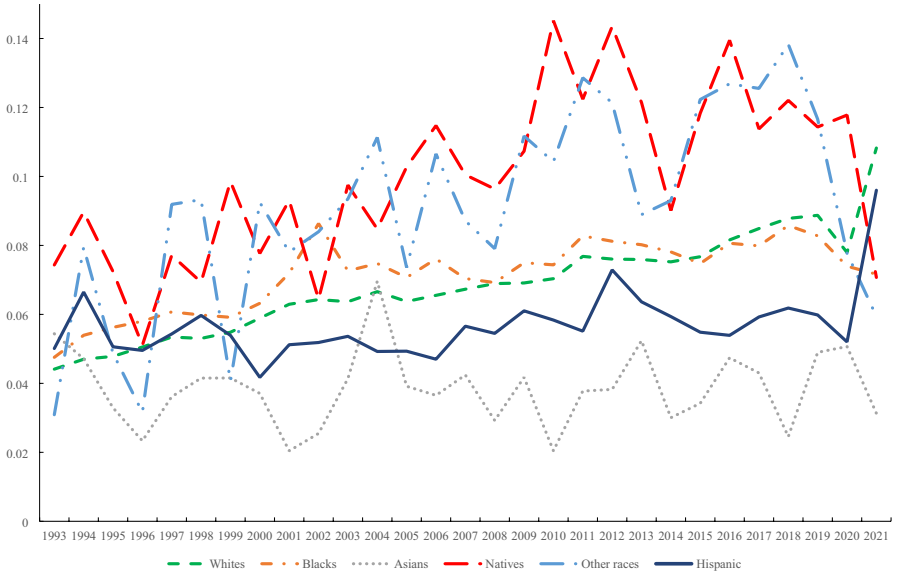

Fig. 2 The incidence of chronic distress by race—non college, 1993–2021

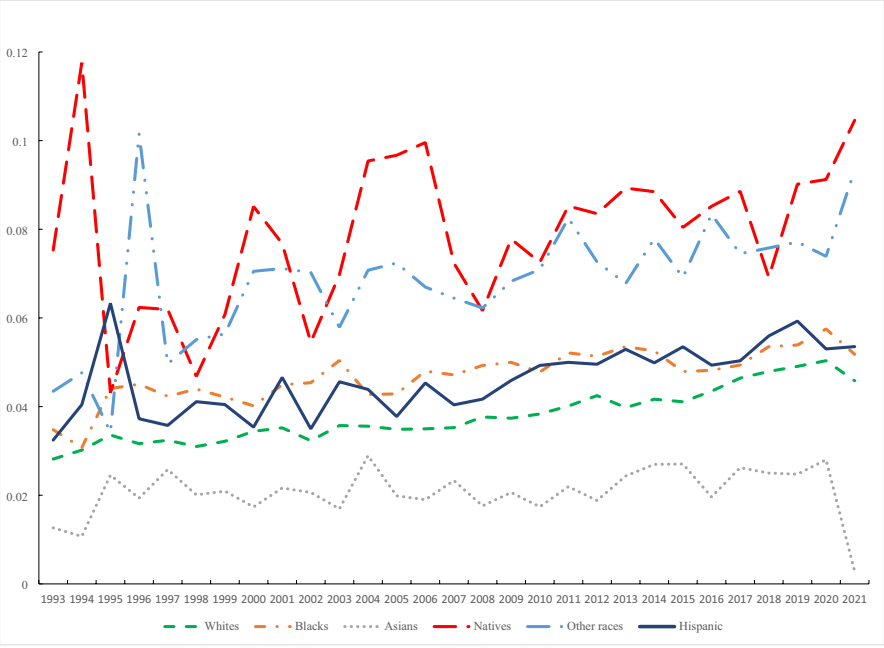

Fig. 3 The incidence of chronic distress by race, some college, 1993–2021

Table 10 OLS well-being models, US Gallup Daily Tracker, 2017

	Negative affect				Positive affect	
	Pain	Stress	Depression	Worry	Cantril	Enjoyment
American Indian	0.096 (17.59)	0.043 (7.16)	0.033 (5.15)	0.030 (5.14)	-0.285 (12.26)	-0.026 (5.91)
Black	-0.027 (7.49)	-0.096 (24.35)	-0.060 (19.53)	-0.065 (17.26)	-0.051 (3.35)	-0.022 (7.60)
Asian	-0.047 (7.25)	-0.049 (6.96)	-0.074 (13.39)	-0.004 (0.51)	-0.063 (2.30)	-0.024 (4.80)
Native Hawaiian	0.010 (0.91)	-0.031 (2.63)	0.0003 (0.03)	-0.008 (0.68)	-0.115 (5.53)	-0.016 (1.92)
Hispanic	-0.036 (8.77)	-0.054 (12.89)	-0.043 (12.17)	-0.011 (2.45)	0.213 (12.25)	-0.033 (8.87)
Male	-0.010 (4.33)	-0.075 (30.76)	-0.073 (36.98)	-0.071 (29.38)	-0.131 (13.40)	-0.003 (1.83)
Constant	0.001	0.681	0.178	0.356	6.937	0.858
Adjusted R^2	0.0570	0.0609	0.0640	0.0337	0.0778	0.0330
N	150,609	150,625	150,546	160,017	150,292	150,456

t-statistics in parentheses. All equations include state dummies plus personal controls for education, labor force and marital status. Excluded category is white. Also includes don't know and refused dummies (not reported). The equations for pain, stress, worry and enjoyment are based on responses to the question, *"Did you experience the following feelings during a lot of the day yesterday? Enjoyment/physical pain/worry/stress?"* The equation for depression is based on responses to the question, *"Have you ever been told by a physician or nurse that you have any of the following, or not—depression?"* The equation for Cantril is based on responses to the question, *"Please imagine a ladder with steps numbered from zero at the bottom to ten at the top. The top of the ladder represents the best possible life for you and the bottom of the ladder represents the worst possible life for you. On which step of the ladder would you say you personally feel you stand at this time?"*

data from the National Health Interview Survey of 2018, which shows that a much lower proportion of American Indians report excellent health than any other group. All our results to this point indicate low well-being, among a greater proportion of Native Americans than for other populations in the USA.

As a further robustness check, therefore, we turn to using Gallup data for 2017 and 2018 from the US Daily Tracker Survey. Here the overall sample size, in Table 10 using 2017 data, is approximately 150,000 individuals. Because the survey questions are different from those in BRFSS, the table is not able to estimate exactly the same form of our chronically poor mental health models as in earlier tables. Its value is that we show similar results with a variety of other well-being measures. Instead of examining extreme distress, Table 10 reports regression equations for four other negative affect dependent variables—pain, stress, worry and depression—along with a positive affect variable on enjoyment. These are (1,0) dependent variables relating to "yesterday." The question wordings are: *Q5. Did you experience physical pain/worry/enjoyment/stress yesterday? Yes/No; Q6. Depression – do you currently have, or are you currently being treated for depression? Yes/No?*

We also consider another positive affect variable, a life satisfaction question on a scale of 0–10, the Cantril ladder with the question wording as follows: *Q7. Please*

Table 11 Further evidence: OLS Equations, US Gallup Daily Tracker, 2018, age < 70

	Pain	Worry	Worry about money	Stress
Native American	0.106 (11.23)	0.036 (3.57)	0.041 (3.97)	0.190 (6.13)
Black	0.013 (2.36)	-0.030 (5.01)	-0.054 (8.94)	0.058 (3.27)
Asian	-0.022 (2.96)	0.026 (3.29)	-0.036 (4.49)	-0.122 (5.02)
Hispanic	-0.008 (1.23)	-0.024 (3.56)	-0.002 (0.25)	-0.014 (0.65)
Native Hawaiians	0.040 (1.92)	0.024 (1.12)	0.045 (2.05)	0.122 (1.82)
Male	-0.0001 (0.24)	-0.038 (12.53)	-0.048 (15.52)	-0.147 (15.78)
Constant	0.241	0.698	0.874	4.007
Adjusted R^2	0.066	0.039	0.065	0.089
N	101,066	100,807	100,978	104,545

t-statistics in parentheses. All equations include state dummies plus personal controls for education, labor force and marital status. Excluded category is White. The equations for pain, worry and stress are based on responses to the question, *"Did you experience physical pain/stress/worry yesterday?"* The equation for worry about money is based on responses to the question, *"In the last seven days you have worried about money – strongly disagree (1) to strongly agree (5)"*

imagine a ladder with steps numbered from zero at the bottom to ten at the top. The top of the ladder represents the best possible life for you and the bottom of the ladder represents the worst possible life for you. On which step of the ladder would you say you personally feel you stand at this time?

The substantive implications of Table 10 are consistent with the paper's earlier patterns. The proportion of people with chronic distress are found to be far greater in general among Native American citizens than other individuals in the USA. In each case, Table 10 reveals that, after controlling for a large set of personal variables, the poor mental health proxy coefficients for American Indians are large and significantly higher than whites. Except for enjoyment, the other racial and ethnic groups have higher levels of mental health than whites.

Some other results on Gallup data are given in Table 11 using 100,000 observations from the 2018 US Gallup Tracker Poll. This is based on question Q5 above relating to pain, stress and worry. Plus, a new question on worry over money scored from one to five: *Q8. In the last seven days you have worried about money – strongly disagree (1) to strongly agree disagree (5).*

The results in Table 11 suggest once again that Native Americans have significantly higher rates of pain, general worry, worry about money and stress than White Americans even conditional on age, education, labor force and marital status.

Table 12 uses additional variables from the 2018 Gallup Tracker data with 110,000 observations. We specifically report results for the Cantril ladder variable from above and three additional dependent variables. These variables are created using the following questions: *Q10. You always feel safe and secure – strongly disagree (1) to strongly agree disagree (5) (variable hwb23); Q11. You like what you do every day*

Table 12 OLS positive affect well-being equations, US Gallup Daily Tracker, 2018

	Cantril	Safe and secure	Like what you do	Standard living
Native American	-0.255 (7.21)	-0.126 (5.90)	-0.087 (4.22)	-0.096 (11.46)
Black	-0.081 (3.99)	-0.148 (12.09)	0.018 (1.50)	-0.075 (15.57)
Asian	-0.137 (4.93)	-0.052 (3.07)	0.034 (2.08)	0.028 (4.22)
Native Hawaiian	-0.104 (1.36)	-0.099 (2.16)	0.022 (0.49)	-0.021 (1.14)
Hispanic	-0.084 (3.53)	-0.027 (1.89)	-0.101 (7.27)	0.010 (1.75)
Male	-0.134 (12.55)	0.079 (12.26)	-0.064 (10.31)	0.006 (2.56)
Constant	5.759	3.812	3.416	0.643
Adjusted R^2	0.101	0.055	0.053	0.083
N	110,003	109,898	109,957	110,110

t-statistics in parentheses. All equations include year and state dummies plus personal controls for education, labor force and marital status. Excluded category is White. Also includes don't know and refused dummies (not reported). The equation for Cantril is based on responses to the question, " *Please imagine a ladder with steps numbered from zero at the bottom to ten at the top. The top of the ladder represents the best possible life for you and the bottom of the ladder represents the worst possible life for you. On which step of the ladder would you say you personally feel you stand at this time?"* The equation for safe and secure is based on responses to the question, *"You always feel safe and secure – strongly disagree (1) to strongly agree (5)."* The equation for like what you do is based on responses to the question, *"You like what you do every day – strongly disagree (1) to strongly agree (5)."* The equation for standard living is based on responses to the question, *"Are you satisfied with your standard of living – agree (1) disagree (0)?"*

– strongly disagree (1) to strongly agree disagree (5) (variable hwb1) and; Q12. Are you are satisfied with your standard of living – agree (1) disagree (0)?

The results in Table 12 demonstrate that Native peoples are, as in the 2017 survey, less likely to rate themselves highly on the Cantril ladder, significantly less likely to feel safe and secure, less likely to report they agree with the statement they like what they do every day and less likely to be satisfied with their standard of living than White Americans, even conditional on age, gender, state of residence, education, labor force status and marital status.

Even though a large number of independent variables are held constant in the empirical analysis and various statistical checks are performed, this paper uses observational data. It finds clear patterns, but that does not necessarily identify deep causal mechanisms behind the higher distress among Native peoples. Economic and social circumstances seem, as a matter of statistical association, to explain much of the observed statistical differences by group, but not all of those differences. We view the paper as a contribution toward the longer-run ideal of establishing the true driving forces of distress and perhaps eventually aiding an understanding of the structural changes potentially required in order to address the observed differences in extreme-distress levels within the modern USA.

4 Conclusions

This paper is the first to compare the much-discussed worsening mental well-being of White American citizens with what was experienced by Native American citizens over the same period. The paper draws upon BRFSS data to calculate a measure of chronic distress, from 1993 to 2020, among a randomly selected group of 8 million US citizens. Complementary data from recent Gallup surveys are used.

The main results are as follows.

(i) In every year since 1993, the level of chronic distress among Native Americans was substantially higher than among White or Black Americans.[21] This was apparent for Native Americans ages 30 and over but not for the young.
(ii) Chronic distress was also relatively high among those who identified themselves as having other racial backgrounds. This is important given the rise over time in the proportion of Americans who report they are Native American combined with some other race.
(iii) The chronic distress gap (illustrated graphically in Fig. 1 in the paper) between the groups widened over time. Levels of persistently poor, and chronic, mental health increased fastest among Native peoples.
(iv) Chronic distress is lower among Native American people living in states with the highest proportion of Native Americans generally. We see this as consistent with the prior literature that suggests the cultural connectedness and community are important for psychological well-being.
(v) Modern data from Gallup paint an equivalent statistical picture, using other kinds of mental ill-being indicators, including information on feelings of pain and worry.

There are limits to what we can learn from the BRFSS and Gallup Survey's about the diverse experiences of Native peoples and Tribal Nations. Nevertheless, we believe this paper is a step forward in the economics literature. The broader American public and many academics are often unaware of the experiences of Native peoples. Native American indicators are often excluded from standard data sets or are merely categorized as "other race" with the excuse that sample sizes are too small. However, there are millions of Native Americans and data sets exist, both public and confidential, that can be used by researchers to contribute to sharing the experiences of Native peoples.

[21] Although this paper is about extreme mental ill-being, and not about deaths per se, it appears that high despair and distress, as with Whites, seem to go with high deaths of despair for Native Americans as found in Heron (2019).

Appendix

Table 13 Numbers of American Indians and Alaska Natives in the USA, not Hispanic: by age group

	2010	2019	% change
Panel A: Alone or in combination			
Under 18 years	1,970,733	2,002,203	1.6
Under 5 years	562,456	548,666	-2.5
5 to 13 years	968,743	1,017,413	5.0
14 to 17 years	439,534	436,124	-0.8
18 to 24 years	733,236	766,214	4.5
25 to 44 years	1,716,138	1,961,218	14.3
45 to 64 years	1,312,953	1,513,592	15.3
65 years and over	405,422	702,325	73.2
85 years and over	35,532	63,804	79.6
Total	6,138,482	6,945,552	13.1
Panel B: Alone			
Under 18 years	1,167,725	1,116,260	-0.1
Under 5 years	329,544	314,226	4.6
5 to 13 years	576,807	591,848	2.6
14 to 17 years	261,374	260,186	-0.5
18 to 24 years	460,875	454,350	-1.4
25 to 44 years	1,089,640	122,551	12.5
45 to 64 years	799,000	938,246	17.4
65 years and over	235,034	403,675	71.8
85 years and over	19,274	403,675	83.6
Total	3,752,274	4,188,092	11.6

Source: Census Bureau https://www.census.gov/newsroom/press-kits/2020/population-estimates-detailed.html

Table 14 Respondent-assessed health, 2018 (%)

	Excellent	Very good	Good	Fair or poor
One race	37	31	23	7
White	38	32	22	7
Black or African-American	34	26	27	11
American Indian or Alaska Native	26	24	31	13
Asian	39	32	21	6
Native Hawaiian or Other Pacific Islander	29	26	33	11
Two or more races	34	29	25	13
Black or African-American, white	29	31	26	14
American Indian or Alaska Native, white	28	31	26	16
Hispanic or Latino	34	28	26	12
Not Hispanic or Latino	38	32	22	9

Source: Summary Health Statistics; National Health Interview Survey
https://www.cdc.gov/nchs/fastats/american-indian-health.htm

Table 15 OLS Chronic distress equations over time, BRFSS, 1993–2021

	1993–2000	2001–2010	2011–2021	1993–2000	2001–2010	2011–2021
Native	0.025 (13.57)	0.039 (36.42)	0.038 (43.56)	0.009 (4.71)	0.012 (10.97)	0.009 (9.97)
Other race	0.021 (7.78)	0.028 (17.44)	0.035 (51.70)	0.013 (4.96)	0.017 (10.92)	0.018 (27.80)
Black	0.007 (9.02)	0.009 (18.58)	0.003 (7.61)	-0.009 (10.95)	-0.015 (30.58)	-0.019 (45.82)
Asian/PI	-0.013 (8.03)	-0.016 (15.88)	-0.021 (26.61)	-0.008 (5.33)	-0.010 (10.14)	-0.015 (20.52)
Hispanic	0.010 (11.58)	0.010 (17.90)	0.004 (7.92)	-0.002 (2.43)	-0.011 (18.96)	-0.013 (27.68)
Age	0.002 (23.62)	0.003 (64.59)	0.002 (62.62)	0.002 (8.76)	0.003 (49.32)	0.002 (44.98)
Age^2*100	-0.002 (23.68)	-0.003 (60.39)	-0.003 (76.62)	-0.002 (18.17)	-0.003 (62.91)	-0.003 (64.23)
Male	-0.016 (37.77)	-0.016 (61.46)	-0.015 (66.20)	-0.012 (27.55)	-0.011 (39.86)	-0.011 (47.71)
Cellphone survey	n/a	n/a	0.006 (21.48)	n/a	n/a	0.005 (17.71)
Personal controls	No	No	No	Yes	Yes	Yes
Constant	0.015	0.014	0.029	0.028	0.026	0.041
Adjusted R^2	0.006	0.007	0.008	0.038	0.058	0.058
N	1,053,725	3,234,775	4,500,356	1,053,699	3,233,422	4,489,433

t-statistics in parentheses. Equations also include state and year dummies and a full set of single year of age dummies

Source: BRFSS

Table 16 Chronic distress equations for prime age and prime age less educated, 1993–2021

	Ages 35–54		Ages 35–54, No college	
Native	0.0444 (39.95)	0.0079 (7.15)	0.0314 (16.22)	-0.0021 (1.11)
Other race	0.0416 (43.98)	0.0208 (21.69)	0.0379 (19.64)	0.0144 (7.77)
Black	0.0064 (12.06)	-0.0214 (40.70)	-0.0094 (9.34)	-0.0359 (36.16)
Asian	-0.0215 (22.36)	-0.0112 (12.07)	-0.0267 (10.23)	-0.0228 (9.09)
Hispanic	0.0058 (10.19)	-0.0133 (23.24)	-0.0227 (23.32)	-0.0321 (32.03)
Male	-0.0207 (72.09)	-0.0169 (59.02)	-0.0316 (53.71)	-0.0249 (42.67)
Cellphone survey	0.0115 (23.74)	0.0075 (15.61)	0.0117 (11.54)	0.0116 (11.78)
Personal controls	No	Yes	No	Yes
Constant	0.0369	-0.0266	0.0881	-0.0866
Adjusted R^2	0.0082	0.0821	0.0116	0.0834
N	2,908,615	2,904,722	989,667	988,613

t-statistics in parentheses. Equations also include state and year dummies and a full set of single year of age dummies

Source: BRFSS

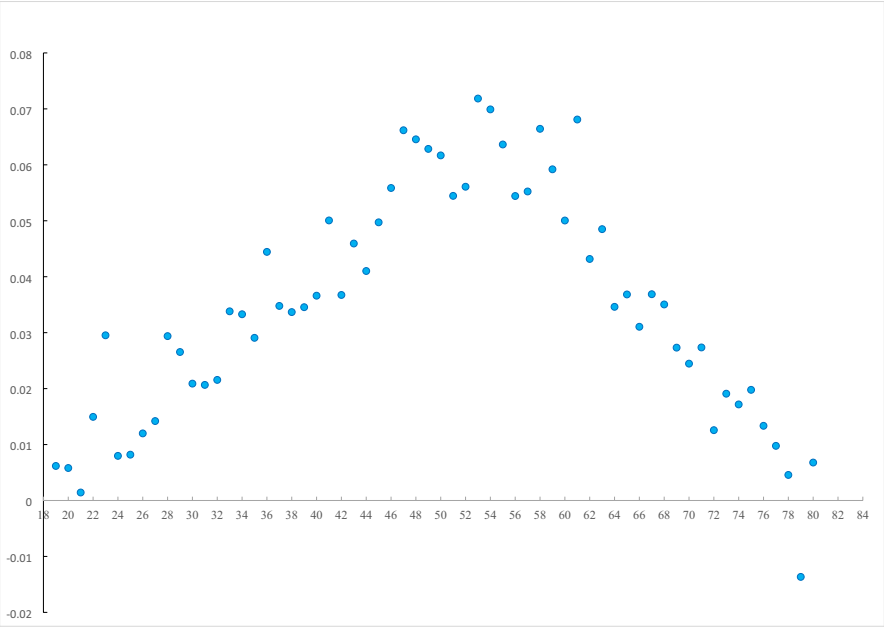

Fig. 4 Despair and age, 1993–2021 Native Americans (year dummies only)

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Authors' contribution Blanchflower conducted the data analysis, and both authors equally wrote the paper and determined its structure.

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Data availability The BRFSS data are publicly available from the Center for Disease Control. The Gallup data files are available through libraries.

References

Akee RK, Copeland WE, Keeler G, Angold A, Costello EJ (2010) Parents' incomes and children's outcomes: a quasi-experiment using transfer payments from casino profits. Am Econ J Appl Econ 2(1):86–115

Akee RK, Taylor JB (2014) Social and economic change on American Indian reservations: A data-book of the US censuses and American Community Survey, 1990–2010. Sarasota: Taylor Policy Group; 2014. Retrieved December 28, 21

Barnes P, Adams P, Powell-Griner E (2010) Health characteristics of the American Indian or Alaska Native adult population: United States, 2004–2008. National Health Statistics Reports, 2010, Vol. 21. Hyattsville, MD: National Center for Health Statistics

Best AF, Haozous EA, Berrington de Gonzalez A, Chernyavskiy P, Freedman ND, Hartge P, Thomas D, Rosenberg PS, Shiels MS (2018) Premature mortality projections in the USA through 2030: a modelling study. The Lancet Public Health 3(8):e374–e384
Blanchflower DG (2021) Is happiness U-shaped everywhere? Age and subjective well-being in 145 countries. J Popul Econ 2021(34):575–624
Blanchflower DG, Oswald AJ (2020) Trends in extreme distress in the USA, 1993–2019. Am J Public Health 110:1538–1544
Blanchflower DG, Bryson A (2021) The consequences of chronic pain in mid-life: evidence from the National Child Development Survey. No. w29278. National Bureau of Economic Research
Blanchflower DG, Bryson A (2022) Further decoding the mystery of American pain: the importance of work. PLos One 17(1):e0261891. https://doi.org/10.1371/journal.pone.0261891
Case A, Deaton A (2017) Mortality and morbidity in the 21st century. Brookings Papers on Economic Activity, Spring, 397–476.
Case A, Deaton A (2015) Rising morbidity and mortality in midlife among white non-Hispanic Americans in the 21st century. Proc Natl Acad Sci USA 112(49):15078–15083
Case A, Deaton A (2020) Deaths of Despair and the Future of Capitalism. Princeton University Press, Princeton, NJ
Cherlin AJ (2018) Psychological health and socioeconomic status among non-Hispanic whites. Proc Natl Acad Sci USA 115(28):7176–7178
Christian CM, Dufour M, Bertolucci D (1989) Differential alcohol-related mortality among American Indian tribes in Oklahoma, 1968–1978. Soc Sci Med 28(3):275–284
Connolly M, Jacobs B (2020) Counting Indigenous American Indians and Alaska Natives in the US census. Stat J IAOS 36(1):201–210
Curtin SC, Hedegaard H (2019) Suicide rates for females and males by race and ethnicity: United States, 1999 and 2017, NCHS Health E-Stat. U.S. Census Bureau. Quick Facts. 2019. https://www.researchgate.net/profile/Sally-Curtin/publication/301688054_Suicide_Rates_for_Females_and_Males_by_Race_and_Ethnicity_United_States_1999_and_2014/links/57221df608ae262228a5cb23/Suicide-Rates-for-Females-and-Males-by-Race-and-Ethnicity-United-States-1999-and-2014.pdf
Erving CL, Thomas CS, Frazier C (2019) Is the Black-White mental health paradox consistent across gender and psychiatric disorders? Am J Epidemiol 188(2):314–322
Evans WN, Topoleski JH (2002) The social and economic impact of Native American casinos. No. w9198. National Bureau of Economic Research. https://www.nber.org/papers/w9198
Falleti TG (2020) Invisible to political science: Indigenous politics in a world in flux. J Politics, forthcoming
Ferguson K (2016) Why does political science hate American Indians? Perspect Polit 14:1029–1038
Gagné T, Schoon I, Sacker A (2021) Trends in young adults' mental distress and its association with employment: Evidence from the Behavioral Risk Factor Surveillance System, 1993–2019. Prev Med 150
Gamble S, Mawokomatanda T, Xu F et al (2017) Surveillance for certain health behaviors and conditions among states and selected local areas — Behavioral Risk Factor Surveillance System, United States, 2013 and 2014. MMWR Surveill Summary 66(SS-16):1–144
Gaydosh L, Hummer RA, Hargrove TW, Halpern CT, Hussey JM, Whitsel EA, Dole NN, Harris KM (2019) The depths of despair among US adults entering midlife. Am J Public Health 109:774–780
Glei DA, Weinstein M (2019) Drug and alcohol abuse: The role of economic insecurity. Am J Health Behav 43:838–857
Goldman N, Glei DA, Weinstein M (2018) Declining mental health among disadvantaged Americans. Proc Natl Acad Sci USA 115(28):7290–7295
Gracey M, King M (2009) Indigenous health part 1: determinants and disease patterns. Lancet 374(9683):65–75
Graham C (2017) Happiness for all? Unequal hopes and lives in pursuit of the American dream. Princeton University Press, Princeton
Graham CL, Pinto S (2019) Unequal hopes and lives in the USA: optimism, race, place, and premature mortality. J Popul Econ 32:665–733
Graham CL, Laffan K, Pinto S (2018) Wellbeing in metrics and policy. Science 362:287–288
Grinols EL, Mustard DB (2006) Casinos, crime, and community costs. Rev Econ Stat 88(1):28–45
Han B, Cotto J, Etz K, Einstein EB, Compton WM, Volkow ND (2021) Methamphetamine overdose deaths in the US by sex and race and ethnicity. JAMA Psychiat 78(5):564–567
Heron M (2019) Deaths: Leading causes for 2017. Nat Vital Rep 66(6):1–76

Hill DL (2009) Relationship between sense of belonging as connectedness and suicide in American Indians. Arch Psychiatr Nurs 23(1):65–74
Hudomiet P, Hurd MD, Rohwedder S (2021). The age profile of life satisfaction after age 65 in the U.S. J Econ Behav Org 189:431–442
Jones DS (2006) The persistence of American Indian health disparities. Am J Public Health 96(12):2122–2134
Keyes CL (2009) The Black-White paradox in health: Flourishing in the face of social inequality and discrimination. J Pers 77(6):1677–1706
Liebler CA, Ortyl T (2014) More than one million new American Indians in 2000: Who are they? Demography 51(3):1101–1130
Liebler CA, Bhaskar R, Porter SR (2016) Joining, leaving, and staying in the American Indian/Alaska Native race category between 2000 and 2010. Demography 53(2):507–540
Marmaros D, Sacerdote B (2006) How do friendships form? Q J Econ 121(1):79–119
Mayer A, Puller SL (2008) The old boy (and girl) network: Social network formation on university campuses. J Public Econ 92(1–2):329–347
Meara E, Skinner J (2015) Losing ground at midlife in America. Proc Natl Acad Sci USA 112(49):15006–15007
Miniño AM, Hedegaard H (2021). Drug poisoning mortality, by state and by race and ethnicity: United States, 2019. NCHS Health E-Stats. https://stacks.cdc.gov/view/cdc/103967
Muennig PA, Reynolds M, Fink DK, Zafari Z, Geronimus AT (2018) America's declining wellbeing, health, and life expectancy: Not just a white problem. Am J Public Health 108:1626–1631
Nagel J (2020) American Indian ethnic renewal: Politics and the resurgence of identity. In American Nations (pp. 330–353). Routledge
Neighbors HW, Jackson JS, Bowman PJ, Gurin G (1983) Stress, coping, and black mental health: Preliminary findings from a national study. Prev Hum Serv 2(3):5–29
Pescosolido BA, Lee B, Kafadar K (2020) Cross-level sociodemographic homogeneity alters individual risk for completed suicide. Proc Nat Acad Sci USA 117(42):26170–26175
Riolo SA, Nguyen T, Greden JF, King CA (2005) Prevalence of depression by race/ethnicity: findings from the National Health and Nutrition Examination Survey III. Am J Public Health 95(6):998–1000
Roux AVD (2017) Despair as a cause of death: More complex than it first appears. Am J Public Health 107:1566–1567
Shanahan L, Hill SN, Gaydosh LM, Steinhoff A, Costello EJ, Dodge KA, Harris KM, Copeland WE (2019) Does despair really kill? A roadmap for an evidence-based answer. Am J Public Health 109:854–858
Shiels MS, Chernyavskiy P, Anderson WF, Best AF, Haozous EA, Hartge P, Rosenberg PS, Thomas D, Freedman ND, Berrington de Gonzalez A (2017) Trends in premature mortality in the USA by sex, race, and ethnicity from 1999 to 2014: an analysis of death certificate data. Lancet 389(10073):1043–1054
Spillane S, Shiels MS, Best AF, Haozous EA, Withrow DR, Chen Y, Berrington de Gonzalez A, Freedman ND (2020) Trends in alcohol-induced deaths in the United States, 2000–2016. JAMA Netw Open 3(2):e1921451–e1921451
Stein EM, Gennuso KP, Ugboaja DC, Remington PL (2017) The epidemic of despair among white Americans: Trends in the leading causes of premature death, 1999–2015. Am J Public Health 107:1541–1547
Sturm C (2011) Becoming Indian: The struggle over Cherokee identity in the twenty-first century (1 ed.). SAR Press. Project MUSE muse.jhu.edu/book/82409
Thornton R (1997) Tribal membership requirements and the demography of 'old' and 'new' Native Americans. Popul Res Policy Rev 16(1):33–42
Tower M (1989) A suicide epidemic in an American Indian community. Am Ind Alaska Natives Mental Health Res 3(1):34–44
Tuck E (2009) Suspending damage: A letter to communities. Harv Educ Rev 79:409–428
Walls ML, Whitbeck LB (2011) Distress among Indigenous North Americans: Generalized and culturally relevant stressors. Soc Mental Health 1:124–136
Woolf SH, Chapman DA, Buchanich JM, Bobby KJ, Zimmerman EB, Blackburn SM (2018) Changes in midlife death rates across racial and ethnic groups in the United States: systematic analysis of vital statistics. BMJ 362:k3096. https://doi.org/10.1136/bmj.k3096