Suicide rates by ethnic group among patients in recent contact with mental health services: an observational study in England and Wales, 2007-2018

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Summary

Background: Recent evidence on suicide rates among psychiatric patients from ethnic minority backgrounds is scarce. We aimed to examine suicide rates among ethnic minority psychiatric patients, and describe their social and clinical characteristics.

Methods: We used a national case-series of patients in England and Wales who died by suicide within 12 months of contact with mental health services between 2007 and 2018. Rates and standardised mortality ratios (SMRs) were estimated for South Asian (Indian, Pakistani, and Bangladeshi), Black African, Black Caribbean, Chinese, and White patients.

Findings: A total of 698 patients in the four minority ethnic groups were included (482 [69%] men; 216 [31%] women; mean age 41 years [SD 14.9, range 12–91] and compared to 13,567 White patients (9,030 [67%] men; 4,537 [33%] women; mean age 48 years [SD 15.8, range 10–100]. Rates and SMRs for suicide among ethnic minority patients were lower compared to White patients. Differences were found between ethnic groups with higher suicide rates in Black Caribbean patients and lower rates in South Asian patients. There was an increase in rates among White patients in 2007-2012 followed by a fall but no change among other ethnic groups. Schizophrenia was more common among Black African and Black Caribbean patients while affective disorder was more common among South Asian patients. Ethnic minority patients overall showed markers of social adversity and received higher intensity care, yet were viewed by clinicians as at lower risk than White patients.

Interpretation: Effective approaches to prevention may differ between minority ethnic groups. Clinicians and the services in which they work should be aware of the common and distinct social and clinical needs of ethnic minority patients with mental illness.

Funding: The Healthcare Quality Improvement Partnership.

Key words: Suicide, suicide rates, ethnic minority groups, psychiatric patients, suicide prevention

Research in context

Evidence before this study

We searched MEDLINE and PsycINFO databases from inception to December 20, 2020, with the terms “suicide”, “suicide rates”, and “suicid*”, combined with “ethnic minority” or “ethnicity” or “BAME”, and “mental health” to identify articles and reviews published in English on suicide among ethnic minority populations. We also checked citations of relevant publications and searched the reference lists of selected articles. Ethnicity is not recorded at death registration in England and Wales, therefore few national studies have examined suicide rates among general or clinical populations. Most UK-based studies have been restricted by small numbers. Existing evidence suggests lower suicide rates among psychiatric patients from ethnic minority backgrounds compared to White patients, although elevated risk has been reported when stratified by age-group in certain ethnic groups. International studies have indicated suicide rates differ between ethnic groups but the evidence is mixed and few report findings from clinical populations.

Added value of this study

This research provided contemporary suicide rates among ethnic minority patients with mental illness in England and Wales. The analysis included larger samples than have previously been reported and is the first study, to the best of our knowledge, to estimate suicide rates using mental health service contact as the denominator. We found significantly lower suicide rates among patients from ethnic minority backgrounds compared to White patients. Suicide rates varied between minority ethnic groups and social and clinical profiles also differed, particularly in the prevalence of common mental disorders such as affective disorder among South Asian patients and schizophrenia among Black African and Black Caribbean patients. The study contributes to identifying variations in management for ethnic minority patients compared to White patients, with greater use of compulsory treatment at admission or Community Treatment Orders after discharge in the former groups.

Implications of all the available evidence

Suicide prevention efforts need to take into account variation across ethnic groups and acknowledge that ethnic minority patients are not a homogenous group. Improvements by mental health services may require greater recognition of cultural backgrounds and closer working with addiction services

for some individuals. The reduced suicide risk among ethnic minorities warrants further exploration in terms of possible protective factors which may help to inform future suicide prevention strategies.

Introduction

In the UK, there has been a recent rise in suicide deaths and the rate currently stands at 11.2 per 100,000 population.[1] Suicide prevention remains a top priority for the UK, reflected by national commitment to make suicide prevention a priority over the next decade, supported by a minimum additional spend on mental health of £2.3 billion annually in the coming years.[2] Part of the national plan includes improving access and outcomes for people from Black, Asian and minority ethnic groups. This is particularly timely as recent global events and social movements as well as the Covid-19 pandemic have led to a much greater focus and societal awareness of ethnic disparities across sectors.

According to the 2011 census the minority ethnic population in England and Wales was 14% in 2011[3] and is estimated to rise to 28% by 2031.[4] UK studies have shown higher rates of psychosis among Black groups[5] and depressive illness among South Asian populations.[6,7] However, there is considerable evidence that health inequalities exist for minority ethnic people in relation to mental health care, not only in accessing services[8] but in higher rates of coercive psychiatric treatment.[9] Black patients in particular have differential rates of being detained under the Mental Health Act (MHA)[10] which can only in part be explained by the higher rates of psychoses in these individuals.[11] To respond, in 2020 NHS England launched the Race and Health Observatory which aims to address health inequalities for patients, communities and NHS staff through analysis and policy recommendations. The recent overhaul of the MHA[12] includes minimising detentions among Black people and other ethnic minorities which is likely to both improve patient experience[13] and also address the substantial costs to the NHS associated with being detained under section.[14]

With regard to suicide, there are few large-scale studies on ethnicity to inform policy and practice; furthermore ethnicity is not routinely recorded on national death registrations in England and Wales. Yet it is important to account for ethnicity in suicide to ensure prevention is tailored to individual needs. Studies carried out on psychiatric populations have found lower suicide mortality ratios in Black Caribbeans with severe mental illness relative to their White British counterparts.[15,16] In contrast, some work shows higher suicide rates among young male psychiatric patients Black Caribbean and Black African origin, and among South Asian, Black African, and Black Caribbean women aged 25-39 compared to White patients.[17] Despite higher suicide rates in certain groups, Bhui et al [18] found common clinical suicide risk indicators such as suicide ideation and depressive

symptoms, and clinician's perceptions of suicide risk, were less evident among ethnic minority psychiatric in-patients who died by suicide than in White in-patients. The picture is mixed, however, as risk factors for suicide such as unemployment, previous violence, and non-adherence with medication were more prevalent among minority ethnic patients who die by suicide. [19]

Over the past two decades we have seen the introduction of the national suicide prevention strategy[20] and major policy initiatives to improve mental health care provision.[21] However, with regard to mental health care for ethnic minority patients, we still do not know whether services are fit for purpose yet knowledge of the relative risks of suicide and the characteristics of ethnic minority patients who have died by suicide may inform preventative efforts. In this study, we examined suicide rates in a clinical sample of ethnic minority individuals and, for the first time, used both general population and mental health service use denominators in order to begin to explore the effects of differential help-seeking. Our additional aims were to investigate trends in suicide and to describe clinical characteristics of patients who died by suicide with a particular emphasis on the management they received.

Method

Study dataset

Data were collected as part of the National Confidential Inquiry into Suicide and Safety in Mental Health (NCISH). The NCISH methodology is described in full elsewhere.[22] Briefly, data collection involves three stages: (i) the collection of a comprehensive national sample of suicides from the Office for National Statistics (ONS); (ii) establishing which individuals had been in contact with mental health services within 12 months of death (via administrative contacts in each mental health service provider); and (iii) collection of clinical information via a questionnaire sent to the clinician responsible for the patient's care. The questionnaire covers socio-demographic characteristics, suicide details, clinical history, and aspects of clinical care.

Ethnicity was recorded by the clinicians based on ONS categories of White, Black Caribbean, Black African, South Asian (Indian, Pakistani or Bangladeshi), Chinese, Mixed or Multiple ethnicity, and 'Other specified' ethnicity. The majority of the White category were White British and while a change of classification methods since 2016 enabled a break down into White East European and White 'Other', we grouped all White sub-groups into the overall White category. The South Asian

group did not have data collected separately so we were unable to investigate the subgroups of Indian, Pakistani, or Bangladeshi. We excluded patients from Mixed or Multiple, and Other ethnic groups from the analysis due to the heterogeneity of these groups.

The cases presented here consist of all patient deaths in England and Wales that occurred between 1st January 2007 and 31st December 2018 with a conclusion at inquest of suicide or undetermined death. It is convention in UK suicide research to include deaths with open conclusions as most are thought to be deaths by suicide therefore this avoids underreporting of suicide cases.[23]

Rates of suicide

We calculated patient suicide rates using data from the NCISH as the numerator and the annual general population estimates provided by ONS as the denominator. As data collection were incomplete in the final year of the study (2018), we excluded this year in the rate calculations and trend analyses, therefore annual rates are presented for 2007-2017 only. The rates were age-standardised using the 2013 European Standard Population,[24] with crude rates also calculated by age-group (See Appendix pg XX). Standardised mortality ratios (SMRs) were calculated as the ratio of observed suicides among patients in each ethnic group to the number of expected suicides in the White population. We estimated exact Poisson confidence intervals (CIs) around the SMRs. Overall SMRs by gender and age-group were calculated using age-groups of 10-24, 25-44, 45-64, and 65 and over, based on age at date of death. We selected these broad age groups to ensure adequate numbers for analysis.

We also calculated crude suicide rates per 100,000 people in contact with mental health services using denominator data obtained from the Mental Health Services Data Set (MHSDS) via NHS Digital.[10] This national dataset holds patient-level data on all individuals in contact with in-patient, out-patient and community mental health services. These rates were calculated for England only due to available denominator data. We were unable to obtain detailed gender or age and ethnicity-specific data, therefore age standardised patient suicide rates by gender were not calculated. As the MHSDS has undergone several changes in its methodology (in 2011, 2015 and 2016) by including other patient groups, such as learning disability services, as well as an overall increase in the number of patients over time, this denominator is less suitable for observing trends over the study period, therefore overall aggregate rates were calculated.

Statistical analysis

Suicide rates and 95% CIs using general population denominators were calculated overall and by gender and age-group for White, Black Caribbean, Black African, and South Asian groups. These groups were selected as they represent the largest ethnic groups in England and Wales. Due to small numbers, an overall suicide rate was calculated for the Chinese sample. Ethnicity denominator data for some ethnic populations were not available from ONS for the year 2010, therefore the average of the population estimates in 2009 and 2011 were calculated to represent 2010 data. As a sensitivity analysis we calculated rates in 2010 using the lower (2009 population estimates) and higher levels (2011 population estimates).

To examine changes in suicide rate trends, join point regression was estimated for every age and sex group.[25] We fitted regression models with age-standardised suicide rates as the dependent variable and the time period as the main independent variable. We used the grid-search method with uncorrelated errors and the permutation test to determine the best joinpoint models. This enabled us to identify points (i.e. 'joinpoints') where there were significant changes in temporal trends in suicide between 2007 and 2017 and estimate the annual percent change (APC) in suicide rates (with 95% CI) between the 'points' identified.

Descriptive findings for aggregate data in 2007-2018 are presented as frequencies and proportions with 95% confidence intervals (CIs). The denominator in all estimates is the number of valid cases for the item as missing data were excluded from analyses. Chi-square tests (or fisher's exact where cell counts were less than 5) compared proportional distributions of sociodemographic and clinical characteristics between patients in different ethnic groups. We did not adjust comparisons by age and sex as these variables may indicate important differences between groups.[7] Deprivation measures were calculated using the English Indices of Deprivation 2015 and the Welsh Index of Multiple Deprivation 2014 tools which measure relative deprivation by linking postcode to small areas of England or Wales known as 'Lower-layer Super Output Areas' (LSOAs). Scores generated were categorised into quintiles, ranging from the most deprived 20% of LSOA's to the 20% least deprived. *P* values less than 5% were considered significant in all analyses. Joinpoint regression analysis was carried out using the Joinpoint Regression Program (Version 4.7.0.0).[26] All descriptive analyses were conducted using Stata version 15.1.[27]

NCISH ethics approval for our study from the North West Research Ethics Committee. NCISH also has ethics approval under Section 60 of the Mental Health and Social Care Act.

Results

Between 2007 and 2018, 15,133 people died by suicide within 12 months of contact with mental health services. Ethnicity status was recorded in 14,717 (97%). A total of 1,150 (8%) individuals belonged to an ethnic minority group, representing an average of 96 deaths per year over the study period. Of the minority ethnic patients, 391 (34%) were South Asian, 139 (12%) Black African, 122 (11%) Black Caribbean, 46 (4%) Chinese, 231 (20%), Mixed/multiple ethnicity, and 221 (19%) 'Other' ethnicity. The following results relate to the 698 patients within the South Asian, Black Caribbean, Black African, and Chinese ethnic groups (482 [69%] men; 216 [31%] women), and comparisons are made with the 13,567 White patients (9,030 [67%] men; 4,537 [33%] women).

Patient suicide rates using general population denominators

Figure 1 shows the average annual age-standardised suicide rates by ethnic group in 2007-2017, based on general population denominators. Compared to White patients with a suicide rate of 2.73 (95% CI 2.68-2.78) per 100,000 population, overall rates were significantly lower in all ethnic minority groups, with the lowest rates in Chinese (1.41, 95% CI 1.00-1.83) and South Asian (1.49, 95% CI 1.33-1.64) patients. Among the ethnic minority groups, the highest rates were in Black Caribbean (1.89, 95% CI 1.55-2.23) and Black African (1.64, 95% CI 1.36-1.91) patients. When stratified by gender, South Asian and Black African male rates were significantly lower than White male rates (Table 1). While the rates in Black Caribbean men were not significantly different to White men, they were the highest rates among all male minority ethnic patients. Rates in women from all ethnic minority groups were significantly lower compared to White women.

When stratified by age group (See Appendix pg XX), rates were significantly lower among South Asian patients aged under 65, Black Caribbean patients aged 45-64, and Black African patients aged 24-44 and 45-64 compared to their White counterparts. Rates among South Asian and Black African men aged 25-44 and 45-64 were significantly lower than White men in these age groups. Compared to White women, rates were lower among South Asian women aged 25-44 and 45-64, Black Caribbean women aged 45-64, and Black African women aged 25-44. Sensitivity analysis (with rates

in 2010 estimated using lower and upper levels of denominators in adjacent years) showed similar results to the main analysis.

Lower SMRs were found among male and female patients from all ethnic minority groups with the exception of male Black African patients aged under 25 (SMR=1.14, 95% CI 0.67-1.78) and Black African women aged 65 and over (SMR=1.85, 95% CI 0.54-5.12), although the numbers were small and the SMRs were not statistically significantly higher than White patients.

Patient suicide rates using service contact denominators

Suicide rates based on clinical denominators were estimated for patients in England to examine any effects of differential help-seeking by ethnic group. The average overall rate of suicide per 100,000 people in contact with mental health services was significantly lower for Black Caribbean (54.3, 95% CI 44.9-65.0) and South Asian (76.0, 95% CI 68.4-84.2) patients compared to White patients (89.5, 95% CI 88.0-91.1). There was no significant difference in rates in Black African patients (86.2, 95% CI 72.4-101.9) compared to White patients. The highest rate of suicide was seen in Chinese patients at 147.1 (95% CI 106.9-197.5), significantly higher than White patients and those in all other ethnic groups, though rates were based on a small number of patients.

Trends in suicide rates between 2007 and 2017

In the total White population, there was an increase in the annual percent change in suicide rates between 2007 and 2012 (APC: 3.9%; 95% CI: 1.1% to 6.8%), followed by a fall in suicide rates (APC: -4.9%; 95% CI: -7.4% to -2.2%) between 2012 and 2017. In the Black African population, a steady but not statistically significant rise between 2007 and 2013 (APC: 8.3%; 95% CI: -2.7% to 20.5%) was followed by a significant sharp fall in suicide rates between 2013 and 2017 (APC: -26.5%; 95% CI: -41.1% to -8.3%). No significant changes in overall trends were found in South Asian or Black Caribbean populations. Suicide rates using a patient denominator significantly fell ($p<0.001$) in the White population and in all ethnic groups between 2007 and 2017. This is likely to reflect a substantial increase in recorded service contact overall.[28]

Characteristics of patient suicide deaths

Amongst minority ethnic patients overall, hanging/strangulation (43%) and jumping from a height or in front of a moving vehicle (24%) were the most common methods of suicide. Fewer ethnic minority patients died by self-poisoning compared to White patients (17% v. 24%; $p<0.001$) while

jumping (24% v. 14%; p<0.001) and burning (4% v. 1%; p<0.001) were more common. Inter-ethnic differences were seen with Black African patients showing the highest proportion of suicide by jumping (36% v. 21% of other minority ethnic patients; p<0.001), Chinese patients by hanging/strangulation (50% v. 42%; p=0.31), and South Asian patients by burning (5% v. 2%; p=0.05).

Overall, patients from an ethnic minority background were younger and more likely to be unemployed compared to White patients (Table 2). In the Chinese group only, the majority (64%) were female. Fewer minority ethnic patients lived alone but more lived in unstable housing(e.g. local authority accommodation) or in areas with the highest deprivation score compared to White patients. Fewer South Asian, Black African, and Chinese patients had a history of self-harm or alcohol misuse compared to White patients but drug misuse was significantly (p<0.001) more common among Black Caribbean patients. A history of violence as a perpetrator was a particular feature among both Black Caribbean and Black African patients.

There were significantly more ethnic minority patients with schizophrenia and other delusional disorders compared to White patients, particularly in Black African (54%) and Black Caribbean (44%) patients (Table 3). In contrast, the proportion of White patients with personality disorder was double that of ethnic minority patients (10% v. 5%; p<0.001). Ethnic minority patients were less likely to have affective disorder, although this was the most prevalent diagnosis in South Asian and Chinese patients. More Black Caribbean patients were diagnosed with concurrent drug dependence/misuse compared to all other patients (23% v. 11%; p<0.001).

Nearly half (48%) of ethnic minority in-patients were detained under the Mental Health Act at the time of death compared to 27% of White in-patients. The higher rate of detention was not solely related to patients with psychosis as this association remained after excluding patients with schizophrenia (41% v. 19%; p=0.01). Fewer ethnic minority patients were receiving care under crisis resolution home treatment teams and they were more likely to have a shorter (<7 days) hospital admission, be non-adherent with medication, and be subject to a Community Treatment Order at their last hospital discharge. Estimates of risk were more often viewed by clinicians as low or none among minority ethnic patients compared to White patients.

Discussion

Main findings

We found that overall suicide rates using both general population and service-contact denominators were lower for ethnic minority patients compared to White patients. However, there was variation within the ethnic minority patient groups, with comparatively higher rates seen in Black Caribbean patients and lower rates in South Asian patients. Standardised mortality ratios were lower in minority ethnic groups compared to their White counterparts except in young Black African men and older Black African women who had slightly higher SMRs, though the differences with White patients were not statistically significant. Our finding of a higher suicide rate in Chinese patients in contact with services was an exception but rates were based on small numbers generating wide confidence intervals and marked year on year fluctuations. We also found a significant increase in rates among White patients in 2007-2012 followed by a fall and this was not mirrored in all ethnic minority groups.

Suicide across all minority ethnic categories were by more violent methods than White patients and they showed more markers of social adversity (deprivation, unemployment). The diagnostic profile also differed with higher rates of schizophrenia in Black African and Caribbean patients, and drug dependence/misuse in Black Caribbean patients. Minority ethnic patients appeared to receive different management from mental health services compared to White patients, primarily in the greater use of the MHA and Community Treatment Orders, shorter admissions, and fewer under crisis home treatment services. Despite these differences, clinicians viewed ethnic minority patients as at lower risk than White patients, perhaps explaining less use of crisis care.

Methodological issues

This is a complete national study of patient suicides using robust case ascertainment. The long study period meant we could examine trends over time whilst also providing the most contemporary and precise estimates of overall rates of suicide among different ethnic patient groups. The results, however, should be considered in the context of a number of limitations. First, the use of general population denominators to calculate rates affects interpretation. However, we are restricted by available data and the rates may still indicate important estimates of risk. Whilst our finding of lower suicide rates among ethnic minority patients may be reassuring, the rates are based on a recent clinical sample, thereby introducing a potential selection bias, and we are unable to determine if

they reflect those in the general population or patients in service contact beyond a year. The lack of recorded ethnicity by coroners means comparative data using general population figures are not available yet there may be high risk people in ethnic minority communities who do not seek help from services. Recording of ethnicity data is soon to be mandatory on death certificates in England which is a welcome development and the current 2021 census may prove valuable in linking health records with self-reported ethnicity. Second, we used a broad definition of suicide to include those with a conclusion at inquest of suicide or undetermined death; this may underestimate suicide rates as, for example, some deaths by poisoning are more likely to be given an accidental outcome at inquest despite being viewed as suicide by clinicians.[29] Third, we cannot define the duration of contact prior to suicide for individual cases and are unable to define or estimate a 'person-years at-risk' period but this would be a useful approach in future studies.

Fourth, the service-contact denominator data were based on information collected by hospitals and we cannot determine the accuracy of ethnicity recorded. This limitation also applies to the accuracy of ethnicity by clinicians for the patient suicide cases, though the four ethnic groups under study were broad and allocation to these groups is likely to be accurate.

Fifth, we were unable to produce age-standardised suicide rates from the target population as service-contact denominator data by age were unavailable, though this would have lost any age effects in rate estimates. We were also unable to estimate these suicide rates by gender. Further, several changes in the MHSDS data collection processes mean time periods are not comparable. The MHSDS, however, represents the most complete source of national denominator data available on mental health activity. Sixth, data collection from clinicians was based on their clinical judgement and case records as opposed to standardised assessments. However, the majority of variables were based on objective information and the quality of NCISH questionnaire data has been shown to be reliable.[30] Seventh, we were unable to examine rates for the sub-groups of the South Asian or Black patients and this warrants further study. Exploring the role of immigration on suicide rates may also be important for future studies. Eighth, due to time associated with legal processes, figures in 2018 were incomplete and we were unable to calculate reliable rates for the whole study period. Ninth, some of our descriptive differences might be accounted for by White patients under mental health services having a greater severity of psychiatric disorder than ethnic minority patients. However, we did not have access to markers of illness severity for patients in contact with mental health services or those who died by suicide. Finally, although this was a national sample, the numbers within some

ethnic minority groups were small and a potential lack of statistical power to detect significant effects, especially when examining trends.

Findings in the context of previous research

Contrary to previous findings, our results indicate that mental health patients from minority ethnic groups have lower overall rates of suicide compared to White patients. Unlike earlier reports, we did not find significantly higher suicide rates among young Black Caribbean or Black African men, or younger women from South Asian, Black Caribbean, and Black African ethnic groups.[17] Rates from the Bhui and McKenzie (2008) study [17] were based on patient suicide deaths in 1996-2001 and it may be that policy initiatives to reduce health inequalities and improve health service provision have had some effect in lowering risk. We also found no increase in rates among elderly South Asian women, as described by McKenzie and colleagues [31] using general population data, possibly supporting their suggestion of a cohort effect to explain this finding.

The rise in rates among White patients in 2007-2012 followed by a fall may be indicative of the effects of the 2008 financial recession, as has previously been reported among men in both general and clinical populations in England.[32,33] However, our finding of no similar trend among ethnic minority patients may provide some support of suggestions that White people can be more adversely affected than ethnic minority groups during times of economic change.[34,35] Alternative explanations include the existence of buffers among certain ethnic groups in counteracting the stressors of a recession, or the more deprived socioeconomic circumstances of some ethnic minority individuals at baseline resulting in a reduced additional impact of a recession. This warrants further investigation. The fall in suicide rates using a clinical denominator is likely to reflect the substantial increase in mental health service contact overall,[28] but other reasons include the introduction and implementation of service recommendations, guidelines, and organisational factors that have reduced suicide.[36,37]

In line with previous studies, we found a higher proportion of schizophrenia across all ethnic groups compared to White patients [5] and comparatively higher rates of depressive illness among South Asian patients.[7,38] Schizophrenia was particularly prevalent among Black Caribbean patients, though the proportion had fallen substantially from earlier studies.[17,19] It is possible that NICE guidelines on the management of schizophrenia, including provision of culturally appropriate treatment[39], has been effective alongside greater community support. Our finding of fewer minority ethnic patients

with personality disorder compared to White patients is in line with earlier work[40] and has been attributed to lower levels of referral,[41] misdiagnosis, or a truly lower prevalence among non-White populations.[40]

We found ethnic minority patients were exposed to more social adversity known to predict poor health outcomes [42,43], yet there were fewer shared indicators of risk including self-harm and depressive illness. This may, in part, explain why risk was viewed as lower by clinicians and indicate differential expression of mental distress among ethnic populations.[38,44] The lack of perceived risk may also be related to a rapid change in mood and suicidality among some ethnic minority patients who died by jumping, a method associated with impulsivity. [45] Our finding of more previous violence among Black Caribbean and Black African patients could indicate more turbulent histories[19] but may also be associated with the greater proportion with schizophrenia among these patients, a diagnosis known to be sometimes associated with aggressive behaviour.[46] It is possible of course that this might also be an ascertainment error with previous violence being more likely to be recorded in the clinical notes of these individuals.

The variability in the management and treatment of ethnic minority mental health patients is well documented [11,47] and our findings confirm this. Given that the management of patients from minority ethnic groups continue to differ in similar ways to findings from over a decade ago [17,19] highlights that services may not be acknowledging how culture can influence the treatment needs of ethnic minority patients, albeit lower rates are encouraging and should raise confidence in services where stigma and safety of services remain relevant.

Implications

Whilst rates of suicide among ethnic minority clinical populations were lower than White patients, the drivers appear to be different and therefore approaches to prevention may also need to vary. Greater social adversity experienced by ethnic minority patients suggests that general, alongside tailored, interventions to improving mental health may be important strategies. Holistic approaches such as social prescribing, i.e. linking primary care with non-clinical services to improve mental health, may be effective and are currently advocated by the English government,[2] though robust studies are needed to establish their effectiveness.[48] The finding of ethnic minority patients receiving more complex care yet were viewed as at lower risk may reflect a less realistic appraisal of risk by clinicians. A paradigm for change in medical education has been highlighted by Metzl and

Hansen[49] who advocate that clinicians need to be systematically competent in relation to stigma and inequality. Positive changes in UK medical school curricula are starting to reflect this, with greater emphasis on training that incorporates further understanding of ethnic diversity.

The important social and clinical differences we found between minority ethnic groups highlights that the 'one size fits all' approach by mental health services may not be fit for purpose. Care, therefore, needs to be better tailored to meet the needs of individual ethnic minority patients and approaches to prevention should not treat minority ethnic patients as homogenous groups. Ensuring substance misuse services are available, culturally competent, and integrated with wider mental health services may also improve outcomes. The complex presentation of some ethnic minority patients and the increased use of the MHA emphasises a high index of suspicion should be maintained even if indicators of risk are not obvious. This, and managing comorbidities, including drug and alcohol problems, seem eminently within reach of mental health services to reduce suicide rates even further.

Table 1: Age-standardised suicide mortality rates per 100,000 population among people who died by suicide within 12 months of contact with mental health services by ethnic group and gender (England & Wales, 2007-2017)

Year	White N=12,960			South Asian N=371			Black Caribbean N=118			Black African N=138		
	N	Rate	95% CI	N	Rate	95% CI	N	Rate	95% CI	N	Rate	95% CI
Males												
2007	737	3.56	3.30-3.81	17	1.50	0.79-2.21	6	1.80	0.36-3.24	10	2.26	0.86-3.66
2008	752	3.62	3.36-3.88	28	2.28	1.43-3.12	13	5.84	2.66-9.01	7	1.29	0.33-2.25
2009	745	3.56	3.30-3.81	24	2.04	1.22-2.85	9	4.18	1.45-6.90	5	1.36	0.17-2.55
2010	800	3.80	3.54-4.07	22	1.75	1.02-2.48	7	2.81	0.73-4.89	9	1.62	0.56-2.68
2011	868	4.14	3.86-4.41	31	2.94	1.90-3.97	6	2.32	0.46-4.18	15	3.47	1.71-5.22
2012	921	4.37	4.09-4.65	34	3.08	2.04-4.11	10	3.62	1.38-5.87	9	2.47	0.86-4.08
2013	873	4.11	3.84-4.38	27	2.42	1.51-3.34	6	2.14	0.43-3.86	12	2.11	0.92-3.30
2014	753	3.56	3.31-3.82	21	1.53	0.88-2.19	13	4.27	1.95-6.59	5	0.92	0.11-1.73
2015	765	3.60	3.34-3.85	18	1.32	0.71-1.92	7	2.95	0.77-5.14	7	1.67	0.43-2.90
2016	729	3.40	3.15-3.64	33	2.77	1.82-3.71	5	2.48	0.31-4.65	4	1.95	0.04-3.86
2017	687	3.19	2.95-3.42	13	1.22	0.56-1.89	4	1.89	0.04-3.74	10	1.62	0.61-2.62
Total	**8,630**	**3.72**	**3.64-3.80**	**268**	**2.10**	**1.85-2.35**	**86**	**3.05**	**2.41-3.70**	**93**	**1.87**	**1.49-2.25**
Females												
2007	363	1.69	1.51-1.86	3	0.37	-0.05-0.80	5	1.72	0.21-3.24	4	1.18	0.02-2.34
2008	382	1.86	1.68-2.05	7	0.83	0.22-1.45	3	1.03	-0.14-2.20	4	1.36	0.03-2.69
2009	357	1.65	1.48-1.82	10	0.68	0.26-1.11	3	0.84	-0.11-1.79	4	1.55	0.03-3.07
2010	410	1.88	1.70-2.06	9	0.85	0.29-1.40	3	0.88	-0.12-1.88	5	3.00	0.37-5.63
2011	417	1.91	1.72-2.09	11	1.20	0.49-1.91	<3	0.77	-0.30-1.84	7	1.26	0.33-2.20
2012	407	1.87	1.69-2.05	13	1.12	0.51-1.73	5	1.72	0.21-3.22	4	1.31	0.03-2.60
2013	408	1.85	1.67-2.03	8	0.75	0.23-1.27	3	0.93	-0.12-1.97	5	3.68	0.45-6.90
2014	420	1.89	1.71-2.07	14	1.19	0.57-1.81	<3	-	-	8	2.17	0.66-3.67
2015	436	1.96	1.77-2.14	6	0.55	0.11-0.98	3	1.05	-0.14-2.24	<3	0.40	-0.15-0.95
2016	399	1.78	1.61-1.95	8	0.57	0.18-0.97	<3	0.56	-0.22-1.34	<3	0.15	-0.15-0.45
2017	331	1.49	1.33-1.65	14	1.17	0.56-1.79	3	0.82	-0.11-1.76	<3	0.15	-0.14-0.44
Total	**4,330**	**1.80**	**1.75-1.85**	**103**	**0.85**	**0.69-1.02**	**32**	**0.92**	**0.60-1.24**	**45**	**1.39**	**0.98-1.79**

Table 2: Socio-demographic and behavioural characteristics of patients who died by suicide within 12 months of contact with mental health services by ethnic group (England & Wales, 2007-2018)

Characteristic	South Asian N=391 N (%; 95% CI)	Black Caribbean N=122 N (%; 95% CI)	Black African N=139 N (%; 95% CI)	Chinese N=46 N (%; 95% CI)	White N=13,567 N (%; 95% CI)	All ethnic minorities N=698 N (%; 95% CI)
Socio-demographic:						
Age: median (range)	41 (15-83)	41.5 (12-83)	35 (18-79)	37 (19-91)	47 (10-100)	40 (12-91)**
Gender:						
Male	283 (72; 68-77)	89 (73; 64-80)	93 (67; 59-74)	17 (37; 24-51)	9,030 (67; 66-67)	482 (69; 66-72)
Female	108 (28; 23-32)	33 (27; 20-36)	46 (33; 26-41)	29 (63; 49-76)	4,537 (33; 33-34)	216 (31; 28-34)
Not currently married	220 (58; 53-63)	98 (84; 77-90)	109 (81; 74-87)	27 (63; 48-76)	9,301 (71; 70-72)	454 (67; 64-71)*
Living alone	93 (25; 21-29)	60 (53; 44-62)	71 (54; 45-62)	14 (32; 20-47)	6,169 (48; 47-48)	238 (36; 32-40)**
Unemployed	192 (51; 46-56)	64 (55; 46-63)	77 (59; 51-67)	18 (41; 28-56)	5,721 (44; 44-45)	351 (52; 49-56)**
Homeless	9 (2; 1-4)	4 (3; 1-9)	4 (3; 1-8)	<3	329 (3; 2-3)	18 (3; 2-4)
Unstable housing	24 (6; 4-9)	15 (13; 8-21)	17 (13; 8-20)	<3	759 (6; 5-6)	58 (9; 7-11)*
Highest deprivation score quintile	135 (35; 30-40)	49 (42; 33-51)	70 (51; 43-60)	20 (44; 30-60)	3,111 (25; 24-25)	274 (40; 36-44)**
Behavioural:						
History of self-harm	196 (54; 49-59)	68 (58; 49-66)	67 (52; 43-60)	20 (43; 30-58)	8,597 (66; 65-66)	352 (53; 49-57)**
History of alcohol misuse	101 (27; 23-32)	54 (47; 38-56)	39 (30; 23-38)	9 (20; 11-34)	6,002 (46; 45-47)	203 (31; 27-34)**
History of drug misuse	112 (31; 26-35)	63 (54; 45-63)	53 (41; 33-50)	7 (16; 8-30)	4,350 (34; 33-34)	235 (36; 32-40)
History of violence	83 (23; 19-27)	43 (38; 29-47)	45 (34; 26-42)	6 (13; 6-27)	2,594 (21; 20-21)	177 (27; 24-31)**

*p<0.05 **p<0.001 in comparison to White patients

Table 3: Clinical and service contact features of patients who died by suicide within 12 months of contact with mental health services by ethnic group (England & Wales, 2007-2018)

	South Asian (n=391)	Black Caribbean (n=122)	Black African (n=139)	Chinese (n=46)	White (n=13,567)	All ethnic minorities (n=698)
Characteristic	**N (%; 95% CI)**	**N (%; 95% CI)**	**N (%; 95% CI)**	**N (%; 95% CI)**	**N (%; 95% CI)**	**N (%; 95% CI)**
Primary diagnosis:						
Schizophrenia and other delusional disorders	125 (32; 28-37)	54 (44; 36-53)	72 (54; 45-62)	15 (33; 21-47)	1,954 (15; 14-15)	266 (39; 35-42)**
Affective disorders	158 (41; 36-46)	36 (30; 22-38)	38 (28; 21-37)	20 (45; 30-58)	5,945 (45; 44-45)	252 (37; 33-40)**
Alcohol dependence/misuse	14 (4; 2-6)	5 (4; 2-9)	4 (3; 1-8)	<3	1,016 (8; 7-8)	24 (3; 2-5)**
Drug dependence/misuse	19 (5; 3-8)	6 (5; 2-11)	4 (3; 1-8)	<3	590 (4; 4-5)	30 (4; 3-6)
Personality disorder	21 (5; 4-8)	5 (4; 2-9)	5 (4; 1-9)	<3	1,324 (10; 9-10)	31 (5; 3-6)**
Any secondary diagnosis	161 (42; 37-47)	63 (52; 43-61)	52 (39; 31-47)	19 (41; 28-56)	6,995 (53; 52-54)	295 (43; 39-47)**
Duration of illness (<12 months)	92 (25; 21-30)	19 (16; 11-24)	25 (20; 14-28)	16 (36; 23-50)	2,753 (22; 21-23)	152 (23; 20-27)
Priority groups:						
In-patient at the time of death	29 (7; 5-10)	13 (11; 6-18)	6 (4; 2-9)	5 (11; 4-23)	959 (7; 7-8)	53 (8; 6-10)
Detained under the MHA as an in-patient	12 (43; 26-61)	7 (54; 29-77)	3 (50; 19-81)	3 (60; 23-88)	255 (27; 24-30)	25 (48; 35-61)*
Died within 3 months of discharge	57 (16; 12-20)	13 (12; 7-20)	25 (19; 13-27)	5 (12; 5-26)	2,035 (16; 16-17)	100 (16; 13-19)
Under the care of crisis teams	52 (14; 11-18)	12 (11; 6-18)	10 (8; 4-14)	6 (15; 7-29)	2,013 (16; 15-17)	80 (12; 10-15)*
Non-adherent with medication	65 (18; 14-22)	17 (15; 9-23)	23 (18; 12-25)	5 (12; 5-25)	1,542 (13; 12-13)	110 (17; 14-20)*
Missed last appointment	71 (20; 16-24)	25 (24; 17-33)	44 (34; 27-43)	10 (24; 14-40)	2,801 (23; 22-23)	150 (24; 21-27)
Service contact						
Detained under the MHA	82 (23; 19-28)	32 (30; 22-40)	52 (41; 33-50)	5 (12; 5-26)	1,645 (14; 13-14)	171 (27; 24-31)**
Subject to a CTO at the time of discharge	12 (10; 6-17)	7 (17; 8-31)	9 (14; 7-25)	<3	104 (3; 3-4)	28 (12; 8-17)**
Last admission <7 days duration	39 (20; 15-26)	15 (21; 13-33)	5 (6; 2-13)	6 (26; 12-47)	1,499 (23; 22-24)	65 (17; 14-22)*
Re-admission within 3 months	32 (16; 12-22)	10 (14; 7-23)	10 (12; 6-21)	4 (17; 6-36)	879 (13; 13-14)	56 (15; 12-19)
Patient-initiated discharge	24 (13; 9-18)	7 (10; 5-19)	7 (8; 4-16)	6 (26; 12-47)	764 (12; 11-13)	44 (12; 9-16)
Short-term risk: low/none	321 (90; 87-93)	92 (87; 79-92)	116 (89; 83-94)	39 (95; 83-99)	10,139 (83; 83-84)	568 (90; 87-92)**
Long-term risk: low/none	225 (67; 62-72)	70 (67; 58-76)	93 (74; 65-81)	28 (70; 54-82)	6,805 (58; 57-59)	416 (69; 65-72)**

MHA = Mental Health Act; CTO = community treatment order
*p<0.05 **p<0.001 in comparison to White patients

Data Sharing

Individual patient-level will not be available due to confidentiality and data-sharing agreements in place. The study protocol, statistical analysis plan, and analytic code is available on request from the corresponding author.

Role of the funding source

The funder had no role in study design, data collection, data analysis, data interpretation, or writing of the report. The corresponding author had full access to all the data in the study and had final responsibility for the decision to submit for publication.

Author contributions: IMH, PT, SK and NK were responsible for data acquisition. NK, JS and LA designed the study with input from all authors. IMH, NR, KB, SI and NK were responsible for analysis and interpretation. SI provided statistical advice in the analysis and interpretation of data. IMH, NR and KB drafted the manuscript under the supervision of NK. KB, KH, PT, PS, SK, JS, NK and LA helped to draft and revise the paper. IMH, NR, SI and NK had full access to all the data in the study and take responsibility for the integrity of the data and the accuracy of the data analysis. IMH and NK verified the data. All authors reviewed and approved the final version of the paper. IMH, LA and NK were jointly responsible for the final decision to submit for publication.

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Conflicts of interest statement: NK is supported by Greater Manchester Mental Health NHS Foundation Trust. NK chairs the National Institute for Health and Care Excellence (NICE) depression in adults guideline and was a topic expert member for the NICE suicide prevention guideline; he previously chaired the NICE self-harm guideline (longer term management) and is currently topic

advisor for the new NICE self-harm guideline. LA chairs the National Suicide Prevention Strategy Advisory Group at the Department of Health and Social Care (of which NK is also a member) and is a non-executive Director for the Care Quality Commission. All other authors declare no competing interests.

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Data sharing

Individual patient-level will not be available due to confidentiality and data-sharing agreements in place. The study protocol, statistical analysis plan, and analytic code is available on request from the corresponding author.