

# BMJ Open Relationship of social and economic factors to mental disorders among population-based samples of Jamaicans and Guyanese

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**To cite:** Lacey KK, Powell Sears K, Crawford TV, *et al.* Relationship of social and economic factors to mental disorders among population-based samples of Jamaicans and Guyanese. *BMJ Open* 2016;**6**:e012870. doi:10.1136/bmjopen-2016-012870

► Prepublication history for this paper is available online. To view these files please visit the journal online (<http://dx.doi.org/10.1136/bmjopen-2016-012870>).

Received 27 May 2016  
Revised 18 November 2016  
Accepted 23 November 2016



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## ABSTRACT

**Background:** There have been growing concerns about increasing mental health problems in the Caribbean region. This study explores rates and factors associated with selected mental health disorders within 2 Caribbean countries: Jamaica and Guyana.

**Methods:** Probability samples of 1218 Jamaicans and 2068 Guyanese participants were used. A modified version of the WHO Composite International Diagnostic Interview (WHO CIDI) defined by the Diagnostic Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV) was administered in order to assess lifetime mental disorders. Descriptive statistics,  $\chi^2$  and hierarchical regression analytic procedures were used to examine rates and factors associated with mental disorders.

**Results:** Rates of mental health conditions were different across contexts and were generally higher for Guyanese compared with Jamaicans for alcohol abuse (3.6% vs 2.2%), drug abuse (1.4% vs 1.3%), substance abuse (4.7% vs 2.7%) and mania (0.4% vs 0.1%). The rate of depression, however, was higher among Jamaicans than Guyanese (7.4% vs 4.1%). There were also noticeable differences in rates in both countries, due to social and economic factors, with social factors playing a larger contributory role in the mental health status of individuals across countries.

**Conclusions:** The results of this study suggest the need for more indepth analyses of factors contributing to mental health conditions of peoples within the Caribbean region, including the influence of additional sources of stress, quality of care and help-seeking behaviours of individuals.

## INTRODUCTION

The international community recognises that mental health is essential to human development and is a crucial determinant of physical health, well-being and socioeconomic outcomes.<sup>1</sup> Mental health disorders, especially major depression, account for a significant

## Strengths and limitations of this study

- This is one of very few cross-national population-based comparative studies to address the mental health of Caribbeans using probability sampling methods.
- The study also provides insight into the prevalence and differences in associations and patterns of mental health across the Caribbean region; specifically, DSM-IV mental health conditions such as depression, substance use and mania which have been understudied in Caribbean countries.
- Owing to data constraints, other mental health conditions (eg, anxiety, suicide) that have recently become of significant concern in the Caribbean region were not examined.

burden of disease in all societies.<sup>2–4</sup> Low-to-middle-income developing Caribbean and Latin American nations, such as Jamaica and Guyana, are likely to face these burdens.<sup>2–5</sup> Based on the WHO Assessment Instrument for Mental Health Systems (WHO-AIMS), unipolar depression alone has been identified as the fifth largest contributor to diseases in Guyana.<sup>6–7</sup> In addition to the more common mental illnesses, Guyana is plagued with high rates of mental health problems resulting from substance abuse.<sup>8</sup> Similar increases in mental illnesses such as schizophrenia have been noted in Jamaica.<sup>9</sup> Even with greater awareness of these disorders in Jamaica and Guyana, there has been a lack of reliable data to aid our understanding about the possible sources of these problems.<sup>8–10–11</sup> Previous studies have largely been based on service use populations. This study used representative population samples to estimate rates and factors associated with mental health conditions of individuals residing in Jamaica and Guyana.

## Prevalence of mental and physical health

There have been growing concerns about increasing mental health problems among individuals within the Caribbean region.<sup>1</sup> Like other countries, the Caribbean region continues to demonstrate that stigma is associated with mental illness.<sup>12–14</sup> Historically, cultural norms have often associated mental illness with spiritual desecration, personal failing and supernatural forces.<sup>15–17</sup> This has resulted in a significant number of mental health problems that go undiagnosed, unreported, untreated and, in turn, understudied.<sup>1 18 19</sup> In addition to these factors, limited resources for research have created difficulty in obtaining estimates on mental disorders within the Caribbean.<sup>13 20 21</sup>

Most work conducted on mental health in Jamaica, for instance, has focused on schizophrenia, which has an estimated rate of 150 per 100 000.<sup>9</sup> However, studies on mental health services usage in Jamaica indicate that along with schizophrenia (51%), mood affective disorders (36%), substance abuse (4%) and personality disorders (3%) were among the primary mental health diagnoses.<sup>22</sup> Of patients referred to a consultation-liaison psychiatry service at a general hospital, depressive disorder (19.9%) was the most prevalent diagnosis.<sup>23</sup>

While mental health issues on other islands such as Guyana, Barbados and Trinidad Tobago have also become pressing concerns, there have been very few studies conducted to understand rates and associated challenges.<sup>1</sup> Some studies in the Americas have estimated a prevalence of 10–15% of the population with mental disorders at any one time, with 3–5% having a severe chronic mental disorder.<sup>7</sup> A review of the available literature on rates of mental health disorders in Latin American and Caribbean countries have estimated major depression at 9.8%, alcohol abuse at 11.3% and drug abuse and dependence at 2.1%.<sup>24</sup> Notwithstanding these estimates, epidemiological data in these regions are still lacking.<sup>25</sup>

## Social correlates of health in Jamaica and Guyana

Social and economic factors are known to be important determinants of health. For instance, considerable gender differences exist in substance use and other mental health conditions in Guyana and Jamaica, with men having higher rates of marijuana use, hard drugs, cigarette and alcohol use.<sup>11 24–29</sup> One study reported that ~22.1% of men compared with 7.2% of women were smokers.<sup>29</sup> Of patients admitted to a drug programme in Jamaica, men constituted the vast majority (87.5% men vs 12.5% women).<sup>30</sup> Conversely, in selected studies across Latin America and the Caribbean, major depression was found at twice the rate for women in Jamaica than it was for men and has been associated with social and material disadvantages.<sup>4 24 26</sup>

Cross-cultural studies also indicate that married individuals traditionally enjoy better health.<sup>31–33</sup> These studies suggest that being married may serve as a protective factor against diseases, with men accruing the greatest

marital health benefits. On the other hand, women, particularly those who are single, may face other social and life challenges predisposing them to poor mental health conditions. For example, having multiple responsibilities and tasks in domestic relationships can create added pressure, increased strain and greater likelihood of mental health challenges.<sup>24</sup> Wilson *et al*'s<sup>34</sup> multistage probability sample of households in Guyana found that women who were heads of household reported more depressive symptoms than women in nuclear family settings. Among individuals being treated for drug abuse in a university hospital in Jamaica, the highest rate was found for single respondents.<sup>30</sup>

An overview of mental health data in Latin America and the Caribbean suggest that mental disorders are more widespread among younger individuals.<sup>10 35</sup> Within the English-speaking Caribbean, for example, higher rates of substance abuse have been found among older adolescents than in some adult age groups.<sup>4</sup> Additional studies are necessary in order to understand the role of age in varying types of mental disorders.

Studies have long found an association between socioeconomic status (SES) and health.<sup>36 37</sup> A multistage probability study conducted on heads of households in Guyana found lower odds of depression among more educated participants.<sup>37</sup> Of patients treated for drug abuse at a treatment programme at a university hospital in Jamaica, 66% had a secondary level education and 50% were unemployed.<sup>30</sup> Given the generally high poverty rate, it is expected that many persons living in the Caribbean region may experience a greater burden of morbidity and early mortality.<sup>38 39</sup>

In various international studies, individuals' racial/ethnic statuses have been linked to certain mental health disorders. In the USA, rates of serious substance and mental disorders are known to be higher among whites than blacks in certain age groups,<sup>40</sup> yet the persistence of these disorders (especially mood and anxiety disorders) have been found to be higher among African-American and Caribbean Blacks.<sup>41</sup> The association between race/ethnicity and the prevalence, duration and severity of mental disorders in the Caribbean region remains largely underexplored. One study conducted in Guyana found higher odds for depressive disorders among Indo-Guyanese compared with other ethnic groups.<sup>26</sup> In Trinidad and Tobago, among patients at substance abuse centres, higher rates of lifetime major depressive (41% vs 37%) and antisocial personality disorder (5% vs 0) were found for East Indians compared with African descent individuals. On the other hand, rates of conduct disorder were higher among Africans in comparison to East Indians (3% vs 7%).<sup>19</sup> As the Caribbean region continues to become more diverse, it is important to understand the association between racial/ethnic background and mental health disorders among different population groups. Individuals within the population might have different experiences, histories and cultures that may predispose

them to certain conditions, while serving as buffers against others.<sup>26 42</sup>

Increased diversity also contributes to potential group divisions, racial conflict and discrimination, which have been found to have implications for health.<sup>43</sup> As a highly diverse nation, Guyana has witnessed its share of racial discord and violence among groups since the 1960s, particularly between Afro-Guyanese and Indo-Guyanese. This alone provides an important basis for studying race/ethnicity in relation to mental disorders.<sup>26 43</sup> Additionally, there are limited available data that might provide understanding of the variations in mental health that might exist among different population groups.

### Framework

A social determinant of health framework may help in understanding differing rates of mental illness across Guyanese and Jamaican populations. For example, people with greater access to social networks, interpersonal relationships and social resources tend to have more positive mental health outcomes. Social networks provide an important source of coping with chronic stress, negative life events and daily hassles, each of which are associated with negative mental health outcomes. Persons with greater access to social networks and support are better prepared to manage stress, a central factor in negative mental health outcomes.<sup>44 45</sup> Researchers examining social determinants of health suggest that both exposure to stress and access to social networks and support vary according to one's social position, with those occupying the most privileged social class, gender and racial statuses faring best. Persons in the Caribbean are particularly vulnerable to stressors, given the high rates of poverty, political instability and violence in the region. Given gender, race and class inequalities, as noted earlier, significant mental health differences may be one likely outcome among different demographic groups.

### Research objective

An emphasis of this study was to estimate rates of selected serious mental health disorders among Jamaican and Guyanese residents. Another objective of the study was to examine the associations of social and economic factors to these disorders. We further examined how mental health conditions may differ by geographic location. We expect that persons occupying relatively marginal social positions across regions will be most likely to experience negative mental health statuses.<sup>44 45</sup>

## METHODS

Data from the Family Across Generations and Nations (FAGN) were analysed. The FAGN is the National Survey of American Life (NSAL)<sup>46</sup> replication and extension study geared to examining the health and

well-being of multigenerational families across contexts. This study included data collection in Jamaica and Guyana. These data collections used an abridged version of the NSAL questionnaire. Human participants' approval was obtained in both countries from the Ministries of Health.

### Jamaica data

Face-to-face interviewing was conducted on regional randomly selected adults (18 and older) living in the 2002 census tracts region of urban Kingston, St Andrew and Portmore area of Jamaica.<sup>47</sup> Interviewing began in August 2005 and was completed in that year. In total, 1218 interviews were conducted. The response rate was 76%.

### Guyana data

Questionnaires were administered by indigenous interviewers to randomly selected adults (18 and older) living in the 2002 census track region of the Greater Georgetown area, as well as in more rural areas to the south and east (see Bynoe *et al.*)<sup>48</sup> The questionnaires were administered between July and December 2005. A total of 2068 questionnaires were completed. The response rate was 82%, slightly higher than the rate in Jamaica.

*Mental health.* Lifetime mental health disorders were assessed using a modified version of the WHO Composite International Diagnostic Interview (WHO CIDI) defined by the Diagnostic and Statistical Manual of Mental Disorder, Fourth Edition (DSM-IV). The disorders included in this study were DSM-IV lifetime alcohol abuse, drug abuse, substance abuse, major depressive disorder (MDD) and mania.<sup>49</sup>

*Social factors.* Social variables included: age (18–29; 30–44, 45–59, 60 and older); gender (male, female); marital status (married, partnered, separated/divorced/widowed, never married) and race/ethnicity. For the Jamaican sample, the category was separated into Black (African descendants) and mixed/other (eg, White, Chinese, East Indian, Other Asian, Hispanic/Latino, Other). The racial category for the Guyanese sample was separated into three groups: Black (African descendants), Indo-Guyanese (East Indian descendants) and mixed/other (eg, Other Asian, Hispanic/Latino, Other).

*Socioeconomic status.* Socioeconomic factors included education (primary or some high school, high school graduates, college/vocational/technical), employment status (employed, unemployed, not in labour force) and household income (categorised as statistical quintiles).

### Analytic strategy

Prevalence rates of mental health conditions were ascertained for Guyana and Jamaica and are reported. Bivariate  $\chi^2$  tests were also conducted to ascertain statistically significant associations between sociodemographic factors and the specified mental health conditions in

the respective countries. Hierarchical logistic regression techniques were employed to examine the relative contributions of social and socioeconomic factors and race/ethnicity to specific mental health conditions in successive steps. Social factors (age, gender, marital status) were included in block 1. Block 2 consisted of socioeconomic variables (education, income, occupational status). Race/ethnicity among Guyanese was entered in the third and final block. Race/ethnicity was excluded in the analysis for Jamaican participants due to uneven distributions; the vast majority of individuals in this country are of African descent and this was reflected in the sample where nearly 98% indicated African ethnicity. Poststratification weights for age and gender were created for the sample regions in each country. Race/ethnicity was an additional stratification factor in Guyana. We used the 0.05  $\alpha$  level for statistical significance.

### Sample characteristics

Guyanese participants on average were older than Jamaican respondents ( $m=40.5$  vs  $m=38.9$ ) (see table 1). More than half of the Guyanese sample was women compared with nearly three-quarters of the Jamaican sample (51.8% vs 69.5%). Approximately one-third of

Guyanese participants were married compared with the more than half of Jamaican participants who were never married (34.2% vs 56.6%). A larger percentage of Guyanese had primary or some high school education, while Jamaicans were mainly high school graduates (54% vs 49.8%). Participants across geographic regions were mainly employed, though Guyanese participants were more likely to have greater employment opportunities than Jamaicans (53.7% vs 44.1%). Income levels were generally higher for Jamaicans, with more individuals within the fourth quintile category (42.4%) compared with Guyanese who were mostly represented in the second quintile category (30%). In Guyana and Jamaica, a large percentage of participants self-identified as Black (55.5% vs 97.4%).

## RESULTS

### Prevalence of mental health disorders

Table 2 shows the rate of the selected mental disorders by geographic locations. Generally, higher rates of mental conditions were found among Guyanese compared with Jamaicans. This was more apparent for conditions such as alcohol abuse (3.6% vs 2.2%), drug abuse (1.4% vs 1.3%), substance abuse (4.7% vs 2.7%) and mania (0.4% vs 0.1%). Only MDD rates were higher for Jamaicans compared with their Guyanese counterparts (7.4% vs 4.1%).

### Bivariate associations with the prevalence rates of disorders

#### Alcohol abuse

The results revealed an association between age and alcohol abuse in both countries, though differences in trends between countries were observed (see table 2). Higher rates of alcohol abuse were found among younger Guyanese (eg, 30–44, 4.9%,  $p=0.002$ ) and Jamaicans over the age of 60 years (6.5%,  $p=0.033$ ). Jamaican and Guyanese males abused alcohol at higher rates (5.7% vs 6.5%,  $p<0.001$ ). Relationship status was associated with alcohol abuse among Jamaicans, but not among Guyanese. Nonetheless, separated, divorced or widowed Jamaicans (5.0%,  $p<0.01$ ) and partnered Guyanese participants (4.2%,  $p=0.929$ ) abused alcohol more excessively.

There were differences in associations between income and alcohol abuse. An association was found for Guyanese but not for Jamaicans. Despite these differences in associations, rates of alcohol abuse were higher among fourth quintile income Guyanese (5.8%,  $p<0.05$ ) and bottom income quintile Jamaicans (4.3%,  $p=0.143$ ). Similarly, differences in association patterns were found between countries for employment status. Alcohol abuse was more prevalent among unemployed Guyanese (5.0%,  $p<0.001$ ). This was also evident among unemployed Jamaicans (2.6%,  $p=0.866$ ). Furthermore, primary or some high school education was associated with higher rates of alcohol abuse among Jamaicans

**Table 1** Sample characteristics in Guyana and Jamaica

Percentage (except for age)	Caribbean samples	
	Guyana (2005)	Jamaica (2005)
Characteristics		
Mean age	40.5	38.9
Gender		
Male	48.2	30.5
Female	51.8	69.5
Marital status		
Married	34.2	20.3
Partnered	16.0	13.2
Sep–div–widow	18.6	9.9
Never married	31.2	56.6
Education level		
Primary/some high school	54.0	28.3
High school graduate	29.7	49.8
College–vocation–technical	16.3	21.9
Employment status		
Employed	53.7	44.1
Unemployed	10.8	28.6
Not in the labour force	35.5	27.4
Equivalised income		
Bottom quintile	14.0	21.1
Second quintile	30.0	24.3
Middle quintile	23.4	1.6
Fourth quintile	22.4	42.4
Highest quintile	10.2	10.7
Ethnicity/race		
Black	55.2	97.4
Other/mix	10.1	2.6
Indo	34.7	–
[N]	2068	1218

**Table 2** Prevalence and factors associated with lifetime mental health disorders

	Alcohol abuse		Drug abuse		Substance abuse		Depression		Mania	
	JA	GUY	JA	GUY	JA	GUY	JA	GUY	JA	GUY
Prevalence rate	2.2	3.6	1.3	1.4	2.7	4.7	7.4	4.1	0.1	0.4
Age										
18–29	1.7	2.0	0.7	1.8	2.0	3.5	8.6	4.5	0.5	0.8
30–44	1.2	4.9	1.4	2.2	1.9	6.5	8.1	3.9	0.0	0.1
45–59	2.4	4.2	1.4	0.2	2.9	4.2	8.1	4.6	0.0	0.4
60 and above	6.5	2.9	1.3	0.4	6.5	3.2	1.3	2.5	0.0	0.0
p Value	0.002	0.033	0.795	0.013	0.015	0.029	0.023	0.495	0.275	0.144
Gender										
Male	5.7	6.5	2.4	2.6	6.2	8.7	5.9	3.5	0.5	0.6
Female	0.6	0.9	0.8	0.2	1.2	1.0	8.1	4.7	0.0	0.2
p Value	0.000	0.000	0.025	0.000	0.000	0.000	0.192	0.185	0.033	0.129
Marital status										
Married	1.2	3.4	0.0	0.1	1.2	3.4	5.3	2.5	0.0	0.6
Partnered	4.3	4.2	1.2	1.2	4.3	5.1	5.6	3.9	0.0	0.3
Sep–Div–Widow	5.0	3.6	3.3	2.1	6.7	5.5	8.3	4.9	0.0	0.5
Never married	1.5	3.7	1.5	2.3	2.2	5.4	8.3	5.3	0.3	0.3
p Value	0.012	0.929	0.068	0.003	0.009	0.251	0.342	0.061	0.674	0.873
Equalised income										
Bottom quintile	4.3	4.5	3.1	1.0	5.1	4.8	7.8	6.2	0.4	0.3
Second quintile	2.0	2.9	0.7	0.5	2.4	3.8	7.5	4.0	0.0	0.3
Middle quintile	0.0	2.9	0.0	2.3	0.0	5.0	10.5	3.3	0.0	0.2
Fourth quintile	1.6	5.8	1.4	2.2	2.1	7.8	6.4	3.9	0.2	0.0
Highest quintile	1.5	1.4	0.0	0.5	1.5	2.4	10.8	3.8	0.0	2.4
p Value	0.143	0.021	0.068	0.036	0.118	0.003	0.532	0.388	0.817	0.000
Education										
Primary/some HS	4.4	3.8	2.6	1.3	4.7	4.9	6.7	4.1	0.0	0.3
High school grad	1.8	3.1	0.8	2.0	2.2	4.7	7.6	4.7	0.3	0.2
College–Voc–Tech	0.4	4.2	1.1	0.6	1.5	4.5	8.3	3.0	0.0	1.5
p Value	0.003	0.663	0.070	0.200	0.028	0.935	0.757	0.426	0.365	0.006
Employment status										
Employed	2.1	4.9	1.7	2.3	2.8	6.7	7.7	4.1	0.4	0.5
Unemployed	2.6	5.0	1.5	1.3	2.9	5.8	10.2	4.5	0.0	0.5
Not in labour force	2.4	1.4	0.6	0.1	2.4	1.5	4.0	4.1	0.0	0.4
p Value	0.866	0.000	0.388	0.001	0.914	0.000	0.008	0.960	0.280	0.006
Race/ethnicity										
Black	–	2.0	–	1.3	–	2.8	–	4.9	–	0.5
Indo-Guyanese	–	6.0	–	0.4	–	6.1	–	3.7	–	0.6
Mixed/other	–	2.7	–	3.6	–	6.3	–	3.1	–	0.0
p Value	–	0.000	–	0.000	–	0.001	–	0.245	–	0.277

(4.4%,  $p < 0.01$ ). While an association was not found among Guyanese participants, high rates of alcohol abuse were found for individuals with primary or some high school education (3.8%,  $p = 0.663$ ). Higher rates of alcohol abuse were also found among Indo-Guyanese (6.0%,  $p < 0.001$ ) compared with other ethnic groups (ie, Black, Mixed/Other) in Guyana.

### Drug abuse

The study results also revealed an association between age and drug abuse among Guyanese; rates were higher among individuals within the 30 and 44 years age category (2.2%,  $p < 0.01$ ). Although no association was observed among Jamaicans, elevated levels of drug abuse were found for individuals between the 30 and 44

and 45 and 59 years age groups (1.4%,  $p = 0.795$ ). In addition, while marital status was associated with drug abuse among Guyanese, the opposite result was found for Jamaicans. Even though rates of drug abuse were more prevalent among Guyanese participants who never married (2.3%,  $p < 0.01$ ), among Jamaican participants, this was primarily reflected among separated, divorced or widowed participants (3.3%,  $p = 0.068$ ).

Differences in association were also observed between income and drug abuse in the respective countries. Specifically, drug abuse was associated with middle-income Guyanese (2.3%,  $p < 0.05$ ). Jamaican participants in the bottom quintile group (3.1%,  $p = 0.068$ ) were more represented. These differences in associations were also found for employment status between

countries. Rates of drug abuse were typically higher among employed Guyanese (2.3%,  $p<0.001$ ) and Jamaicans (1.7%,  $p=0.388$ ).

Jamaica and Guyanese males had higher rates of drug abuse (2.4% vs 2.6%,  $p<0.05$ ). Race/ethnicity was further associated with drug abuse in Guyana, with higher rates found for mixed/other participants (3.6%,  $p<0.001$ ).

### Substance abuse

Within both contexts, an association was found between the age of participants and substance abuse. Participants in Jamaica over the age of 60 years, and Guyanese participants between the ages of 30 and 44 years (6.5% vs 6.5%,  $p<0.05$ ) had higher substance abuse rates. The results also revealed an association between substance abuse and gender; men in Guyana and Jamaica (8.7% vs 6.2%,  $p<0.001$ ) had higher substance abuse rates. In terms of relationship status, however, opposite association patterns were found between countries. In Jamaica, separated, divorced or widowed participants were associated with increased substance abuse rates (6.7%,  $p<0.01$ ); while not significant, separated, divorced or widowed Guyanese had higher rates (5.5%,  $p=0.251$ ) of substance abuse.

Differences in association patterns in SES and substance abuse likewise were observed between countries. Among Guyanese, greater rates of substance abuse were associated with the higher quintile category (eg, fourth quintile) (7.8%,  $p<0.01$ ). In contrast, excessive rates of substance abuse were found among bottom quintile Jamaican participants, though not statistically significant (5.1%,  $p=0.118$ ). These differences in substance abuse patterns were further found for level of education. For instance, among Jamaicans, having primary or some high school education (4.7%,  $p<0.05$ ) was associated with higher rates of substance abuse. Among Guyanese (4.9%,  $p=0.935$ ), higher rates of substance abuse were also found within this educational category. Additionally, substance abuse was associated with employed Guyanese participants (6.7%,  $p<0.001$ ). Even though the rate of substance abuse was also higher among unemployed Jamaican participants, a significant association was not observed (2.9%,  $p=0.914$ ). Race/ethnicity again was associated with substance abuse disorders. Mixed/other Guyanese had the highest rate of substance abuse compared with other racial/ethnic groups (6.3%,  $p<0.001$ ).

### Major depression

Dissimilar relationships were found between age and MDD in both countries. Jamaicans between the ages of 18 and 29 years were at greater risk for depression (8.6%,  $p<0.05$ ). On the contrary, depression rates were higher among Guyanese between the ages of 45 and 59 years (4.6%,  $p=0.495$ ). Similar to previous results, there were differences in associations found between countries for employment status. Higher rates of depression were associated with unemployed Jamaicans (10.2%,  $p<0.01$ ).

Rates were also higher for Guyanese (4.5%,  $p=0.960$ ) in this category.

### Mania

Jamaican (0.6%,  $p<0.05$ ) and Guyanese (0.6%,  $p=0.129$ ) male participants had higher rates of mania, although the associations were different. Dissimilar associations were also found for income, education and employment status in the respective countries. For example, mania was associated with the highest quintile category in Guyana (2.4%,  $p<0.001$ ). Among Jamaicans, higher rates of mania were found among bottom quintile participants (0.4%,  $p=0.817$ ). Similarly, education was associated with mania among Guyanese participants, but not for Jamaicans. Specifically, being college educated was associated with mania in Guyana (1.5%,  $p<0.01$ ). In Jamaica, higher rates of mania were found among participants who had a high school education (0.3%,  $p=0.365$ ). Additionally, employed and unemployed participants (0.5%,  $p<0.01$ ) were associated with high rates of mania in Guyana. In Jamaica, higher rates of mania were found among those employed (0.4%,  $p=0.280$ ).

### Multivariate analysis predicting mental health disorders

As shown in table 3, social and economic factors contributed to alcohol abuse, but had a different influence on Jamaican ( $R^2=24.3\%$ ;  $p<0.001$ ) and Guyanese ( $R^2=16.6\%$ ;  $p<0.001$ ) participants. Among Jamaicans ( $R^2=18.1\%$ ;  $p<0.001$ ) and Guyanese ( $R^2=9.5\%$ ;  $p<0.001$ ) participants, stronger associations were found for social factors. SES ( $R^2=3.6$ ;  $p<0.05$ ) and race/ethnicity among Guyanese ( $R^2=3.5$ ;  $p<0.001$ ) also contributed significantly to alcohol abuse.

Table 4 shows that contributions of social and economic factors to drug abuse. Again, the contribution was different, with stronger association found for social factors among Jamaican ( $R^2=9.9$ ;  $p<0.01$ ) and Guyanese ( $R^2=16.9\%$ ;  $p<0.001$ ) participants than economic factors. Nonetheless, SES ( $R^2=6.4\%$ ;  $p<0.05$ ) and race/ethnicity ( $R^2=7.8\%$ ;  $p<0.001$ ) contributed significantly to the model among Guyanese. This was not the same for respondents from Jamaica.

With respect to the specific populations, table 5 shows that social and economic factors collectively provided an explanation of substance abuse among Jamaicans

**Table 3** Multivariate analysis predicting lifetime alcohol abuse

Characteristics	Jamaica		Guyana	
	R <sup>2</sup>	ΔR <sup>2</sup>	R <sup>2</sup>	ΔR <sup>2</sup>
Step 1				
Social factors	18.1***	–	9.5***	–
Step 2				
SES	24.3***	6.2	13.1***	3.6*
Step 3				
Race/ethnicity	–	–	16.6***	3.5***

\* $p<0.05$ ; \*\* $p<0.01$ ; \*\*\* $p<0.001$ .

**Table 4** Multivariate analysis predicting lifetime drug abuse

Characteristics	Jamaica		Guyana	
	R <sup>2</sup>	ΔR <sup>2</sup>	R <sup>2</sup>	ΔR <sup>2</sup>
Step 1				
Social factors	9.9**	–	16.9***	–
Step 2				
SES	19.7**	9.8	23.3***	6.4*
Step 3				
Race/ethnicity	–	–	31.1***	7.8***

\*p&lt;0.05; \*\*p&lt;0.01; \*\*\*p&lt;0.001.

**Table 5** Multivariate analysis predicting lifetime substance abuse

Characteristics	Jamaica		Guyana	
	R <sup>2</sup>	ΔR <sup>2</sup>	R <sup>2</sup>	ΔR <sup>2</sup>
Step 1				
Social factors	14.8***	–	12.2***	–
Step 2				
SES	20.4***	5.9	16.2***	4.0***
Step 3				
Race/ethnicity	–	–	18.8***	2.6***

\*p&lt;0.05; \*\*p&lt;0.01; \*\*\*p&lt;0.001.

**Table 6** Multivariate analysis predicting lifetime major depressive disorder

Characteristics	Jamaica		Guyana	
	R <sup>2</sup>	ΔR <sup>2</sup>	R <sup>2</sup>	ΔR <sup>2</sup>
Step 1				
Social factors	3.1**	–	1.3	–
Step 2				
SES	4.4	1.3	2.9	1.6
Step 3				
Race/ethnicity	–	–	3.3	0.4

\*p&lt;0.05; \*\*p&lt;0.01; \*\*\*p&lt;0.001.

(R<sup>2</sup>=20.4; p<0.001) and Guyanese (R<sup>2</sup>=16.2; p<0.001). However, a stronger link was found between social factors and substance disorders in Jamaica (R<sup>2</sup>=14.8; p<0.001) and Guyana (R<sup>2</sup>=12.2%; p<0.001). Socioeconomic factors also contributed significantly to substance abuse in Guyana (R<sup>2</sup>=4.0; p<0.001); this was not the case in Jamaica. Race/ethnicity was also a significant contributor among Guyanese (R<sup>2</sup>=2.6%; p<0.001) respondents.

As illustrated in table 6, social and economic factors provide little explanation of depressive symptoms among participants in both countries. In fact, only social factors contributed significantly in explaining major depression disorder in Jamaica (R<sup>2</sup>=3.1%; p<0.01). This relationship, however, was attenuated when other factors were added to the model. We did not examine the associations with mania due to sample size limitations.

## DISCUSSION

This study on rates and social and economic factors associated with mental health status using population-based

samples collected in Jamaica and Guyana found differences in mental health disorders between countries. Higher rates of mental conditions were generally found among Guyanese compared with Jamaicans. Prevalence rates were typically higher for mental disorders such as alcohol abuse, drug abuse, substance abuse and mania among Guyanese participants; Jamaicans had a greater prevalence rate of depression. Social and economic factors were associated with mental health conditions, but there were also noticeable differences in patterns between countries. For example, men as well as separated, divorced or widowed individuals of both genders were vulnerable to alcohol abuse, drug abuse, substance abuse and mania. While the disadvantaged socio-economic groups were generally susceptible to these conditions, the results were not consistent across populations. Race/ethnicity was also associated with specific mental health conditions in Guyana. For alcohol abuse, drug abuse and substance abuse in particular, higher rates were found among Indo-Guyanese and mixed Guyanese. These differences in rates may be reflective of access to social networks that are necessary for coping with social stressors. In Guyana, social and political tensions between African and Indian subgroups may be associated with higher rates of poor mental health. Research in race-related stress supports the link between interethnic tensions and poor mental health.<sup>50–52</sup> Given the relatively small total population in Guyana, long-standing racial divisions may lead to more fragmented and fragile social networks within ethnic communities. The gender differences in mental health found in this study may be due to the considerable gender divisions within Caribbean societies, and lower likelihood of men establishing and maintaining active social networks, compared with women.<sup>53</sup>

These results were supported in multivariate analyses that showed social and economic factors collectively contributing to mental disorders. Across countries, however, social factors (ie, age, gender, marital status) provided a stronger explanation of participants' mental health disorders. These relationships were particularly salient for alcohol abuse, drug abuse and substance abuse. This relationship was also evident for depression among Jamaican participants.

There are various limitations in using cross-sectional data; one of the biggest is that causal inferences cannot be drawn. Additionally, while data were collected across regions in Guyana, information was only obtained on individuals within the Kingston Metropolitan areas of Jamaica. Although this region comprised the majority of the country's population at the time of data collection, the study should only be generalisable to individuals within this area. Also, due to data constraints, we were unable to obtain information on other mental health conditions that have recently become of more concern in the Caribbean region (eg, anxiety, suicide). Sample size issues also prevented us from examining specific mental disorders (mania) in multivariate analysis.

Moreover, due to low sample sizes, some of the association found in this article should be interpreted cautiously.

Notwithstanding these limitations, to the best of our knowledge, this is the first cross-national comparative study to address the mental health of select Caribbean countries using probability sampling methods. With few exceptions, previous studies have mainly been based on clinical samples, limited to few mental disorders, or lacking structured clinical assessments. We used structured clinical measures based on DSM-IV to assess mental health conditions; measures that may provide more reliable estimates. Moreover, this study provides insight into differences in associations and patterns of health across the Caribbean regions; specifically on mental health conditions such as depression, substance use and mania which have been understudied in Caribbean countries.<sup>9</sup>

The study supports the need for greater attention and services for individuals with mental disorders, particularly in Guyana where higher rates of serious mental disorders were found. It is estimated that between 75 000 and 112 500 individuals require mental health services in Guyana.<sup>7</sup> Owing to excessive mental disorder rates, the government of Guyana has since paid greater attention to this problem in attempting to create safer mental health environments, and promoting programmes for law enforcement agencies to divert cases to public hospitals. Still, Guyana faces many challenges in addressing these problems because of a fragmented, poorly resourced and lack of an integrated healthcare system.<sup>7</sup>

In Jamaica, there are advances made in mental health policies for the care and protection of the mentally ill of adults, children and adolescents within the communities and at mental health facilities. Thus, consonant with international obligations, Jamaica establishes community-based mental health programmes and has exercised vigilance of individuals suffering from mental health conditions. Jamaica was also the first English-speaking country in the Caribbean to develop a national plan to reform the mental healthcare system.<sup>10</sup> This may provide an explanation for the difference in rates of mental health disorders between countries. Higher rates within Guyana may also be related to multi-ethnic differences with historical patterns of racial discord and discrimination in the country; this is much different from that in Jamaica, which has a predominantly black population. Guyana has experienced racial/ethnic tension and conflict between Indo-Guyanese and Afro-Guyanese.<sup>26</sup> Scholars have documented that there are mental health risks associated with the stressors of living within racially hostile environments.<sup>54 55</sup>

Even though there are more active measures being taken than ever before, Caribbean countries like Guyana and Jamaica are still contending with social and economic challenges in addressing mental health problems. In addition to the lack of resources and fewer treatment centres with qualified personnel, social stigmas about

mental health problems remain a barrier to persons seeking care. Stigma against the mentally ill is reported to be very pervasive, and is expressed by health professionals, the police and policymakers alike.<sup>7</sup>

**Contributors** KKL was the lead author. KKL, KPS, TVC and JSJ contributed to the conceptualisation and writing of this manuscript. NM conducted the analyses.

**Funding** The National Survey of American Life was funded by the National Institute of Mental Health (U01-MH57716), with supplemental support from the Office of Behavioral and Social Science Research at the National Institutes of Health, and the University of Michigan.

**Competing interests** None declared.

**Ethics approval** Human participants' protocol for the NSAL was obtained through the University of Michigan's institutional review board.

**Provenance and peer review** Not commissioned; externally peer reviewed.

**Data sharing statement** No additional data available.

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