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High prevalence of mental disorders and comorbidity in the Geneva Gay Men's Health Study

■ **Abstract** *Background* Several large surveys have suggested high prevalence of psychiatric disorders among gay men and other men who have sex with men. *Methods* In 2002, a comprehensive health survey was conducted among 571 gay men in Geneva, Switzerland, using probability-based time-space sampling. The Composite International Diagnostic Interview Short-Form (CIDI-SF) was used to assess 12-month prevalence of major depression, specific phobia, social phobia, alcohol dependence, and drug dependence. *Results* Nearly half (43.7%, 95% CI=39.0–48.4) of the sample fulfilled the criteria for at least one of the five DSM-IV disorders: 19.2% had major depression, 21.9% had specific and/or social phobia, and 16.7% had an alcohol and/or drug dependence disorder in the past 12 months. Over one quarter of the cases were comorbid with another kind of disorder, and 35.7% of cases consulted a health care professional in the past 12 months for mental health. Like cases, screen-positives for mood and/or anxiety disorders (24.7%) also reported significantly greater disability and lower quality of life. *Conclusions* Nearly two-thirds of this community sample of gay men was affected by psychiatric morbidity with new evidence for comorbidity, subthreshold disorders, and low levels of awareness of psychiatric disorders and their treatment. This population needs to be a priority in psychiatric epidemiology and mental public health.

■ **Key words** homosexuality – major depression – anxiety – substance use – comorbidity

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Introduction

The study of mental health in non-clinical populations has received a huge boost in the past decade thanks to the advent of standardized instruments to assess psychiatric disorders [13]. Using the Composite International Diagnostic Interview (CIDI), the European Study of the Epidemiology of Mental Disorders (ESEMeD) has provided population prevalences for over ten different disorders—e.g., 12-month prevalences of 2.8% (95% CI=2.3–3.3) for any mood disorder, 3.8% (95% CI=3.3–4.3) for any anxiety disorder, and 1.7% (95% CI=1.4–2.0) for any alcohol disorder [27] among men—in western Europe. Such data are essential for understanding the health burden associated with psychiatric disorders and identifying groups with elevated morbidity.

Psychiatric epidemiological studies among the general population in industrialized countries on three continents have repeatedly shown increased morbidity among women, urban residents, the unmarried/unpartnered, and the unemployed [27, 28]. The only large psychiatric epidemiological surveys to include any indicator of sexual orientation have been the US National Comorbidity Survey (NCS) [12] and the Netherlands Mental Health Survey and Incidence Study (NEMESIS) [22]. Two other US surveys have gathered

data on both sexual orientation and psychiatric disorders [6, 7]. The 12-month point prevalence for men with same-sex partners in these surveys ranges from 9.8 to 31.0% for major depression, 8.8 to 11.0% for specific phobia, 7.3 to 8.3% for social phobia, 6.1 to 12.9% for alcohol abuse, 8.9 to 12.1% for alcohol dependence, 1.2 to 10.7% for drug abuse, and 0 to 9.2% for drug dependence. Most of these prevalences are significantly higher than those found among heterosexual men. While these analyses have provided some solid indications of increased psychiatric morbidity among gay men, they have the following limitations: discrepancy between DSM-III-R and DSM-IV diagnostic criteria, different time frames for history of same-sex activity as proxy for sexual orientation, and fewer than 100 men who fulfill the same-sex criteria despite large samples.

With few exceptions [19], most of the other existing data on mental health among gay men come from HIV clinical studies [4], many of which are limited by small size, a focus on mood disorders, and instruments which measure non-specific psychological distress rather than criteria for clinical disorders. Against this backdrop, the Geneva Gay Men's Health Survey was conceived of as a comprehensive health survey—the first of its kind—conducted among a probability sample of gay men. Given the importance of mental health, a section on DSM-IV psychiatric disorders was included.

■ Aims of the study

This article presents a psychiatric epidemiological profile for five mood, anxiety, and alcohol/drug use disorders among a community sample of gay men in Geneva, Switzerland. The larger sample size permits analyses to go beyond 12-month prevalence estimates published to date to include comorbidity, onset, disability, and treatment of selected psychiatric disorders.

Materials and methods

■ Design and sample

The Geneva Gay Men's Health Survey was a cross-sectional venue-based probability survey, using time-space sampling developed by the Centers for Disease Control and Prevention (CDC) [16, 24]. All meeting points frequented by gay men in Geneva were enumerated for visits over a 1-week period in 2002, and target numbers of participants were set for each venue by an algorithm to reach an overall sample of 600. Venues were randomly selected in a first step, followed by random selection of time slots in a second step, and finally random selection of participants at the venue in a third step.

From September through December 2002, recruitment took place at 35 different meeting points—i.e., gay organization events, bars/cafes, discos/parties, sex clubs, saunas, parks/toilets, and Internet chatrooms. A total of 1153 eligible men—i.e., self-identified as gay and/or having sex with men—were invited to take part in the survey of whom 571 (50%) actually participated. The participation rates ranged from 15% in chatrooms to 86% in gay organization events. At the physical venues—i.e., excluding the chatrooms—the participation rate was 62%.

The endeavor was publicized as a general health survey among gay men, and not one focusing on mental health or HIV. Indeed, the survey instrument contained 550 questions, covering socio-demographics, subjective health status, physical health, mental health, substance use, psycho-social variables, health care, life domains, and socio-environmental stressors. Questions specific to sexual orientation were included in several of the aforementioned domains. Participants were given a unique code and asked to complete the first part of the questionnaire at a laptop onsite (for physical venues) and the second part at their leisure online.

Quantifiable venue frequentation data over the past 12 months were collected in order to examine potential biases related to recruitment. Splitting the combined frequency of all venues into quartiles, no significant differences were found for any of the study variables. According to informants, there are few self-identified gay men in Geneva who do not use any of the meeting points, thereby falling outside of the sampling scheme.

■ Assessment of 12-month diagnosis

Five disorders—i.e., major depression, specific phobia, social phobia, alcohol dependence, and drug dependence—were selected from the WHO Composite International Diagnostic Interview Short-Form (CIDI-SF) 12-month DSM-IV version 1.0 [15] which was conceived for inclusion in health interview surveys. Caseness is determined by standard algorithms [15], whereby a certain proportion of symptomatic criteria is met. Men who pass screen questions but do not fulfill diagnostic criteria are referred to as "screen-positive" or "subthreshold" in this article. Screen questions for mood and anxiety disorders address main symptom(s) and duration, whereas for substance use disorders, they merely indicate use.

Questions on self-reported history of depression and chronic anxiety were taken from the Swiss Health Survey, which also included additional questions on treatment. The CIDI-SF for major depression also includes questions on treatment. A general question on consulting any health professional for mental health was taken from the Canadian Community Health Survey, whereby the responses were adapted to yield both 12-month and lifetime percentages.

The question on current subjective health was taken from the European Health Interview Survey (EUROHIS) initiative by WHO Europe [3]. Temporary mental disability was measured by an instrument recommended by EUROHIS based on the OECD which covers restriction of daily activities in the past 2 weeks [3]. Quality of life was assessed using instruments recommended by EUROHIS [20]—i.e., MHI-5 (from MOS SF-36) for psychological distress and WHOQOL-BREF for global quality of life and the four domains of physical health, psychological health, social relationships, and environment.

■ Statistical analysis

Data analysis was performed by SPSS version 6.1.1 for the Power Macintosh (Gornichem, Netherlands). In general, nominal and ordinal variables were analyzed using contingency tables and the chi-square test. For normally distributed continuous variables such as age, the t-test was used. Odds ratios (OR) and 95% confidence intervals (CI) are presented without adjustments due to the lack of differences along socio-demographic variables. For analysis of continuous data with a dependent variable consisting of three categories, ANOVA with Tukey test to correct for multiple comparisons at $P<.05$ was used.

Results

■ Socio-demographic characteristics

Table 1 outlines the characteristics of the study population. When compared to the general male popu-

Table 1 Description of sample and demographic correlates of mental disorder* in the past 12 months, Geneva Gay Men's Health Survey, 2002

	Total sample		Any mental disorder*		
	n	%	%	OR	95% CI
Age					
Under 24	96	17.2	41.2	1.60	(0.58–4.40)
25–34	173	31.0	46.4	1.98	(0.76–5.14)
35–44	194	34.8	45.6	1.92	(0.75–4.94)
45–54	67	12.0	38.9	1.45	(0.51–4.13)
55 and above	28	5.0	30.4	1.00	–
Education					
Mandatory education	26	4.7	30.8	0.60	(0.18–2.03)
Apprenticeship	134	24.0	45.7	1.14	(0.69–1.89)
Gymnasium	43	7.7	53.1	1.54	(0.73–3.27)
Other prof. training	123	22.0	41.8	0.98	(0.59–1.61)
University	232	41.6	42.4	1.00	–
Employment status					
Paid employment	446	78.9	42.4	1.00	–
In school	49	8.7	50.0	1.35	(0.70–2.62)
Other situation	40	7.1	42.3	1.00	(0.44–2.23)
Unemployed	30	5.3	47.8	1.24	(0.53–2.90)
Income					
≤sFr 3000	133	31.3	46.6	1.15	(0.58–2.28)
sFr 3001–5000	95	22.4	51.6	1.40	(0.68–2.88)
sFr 5001–7000	100	23.5	38.8	0.83	(0.40–1.72)
sFr 7001–9000	53	12.5	32.1	0.62	(0.27–1.42)
≥sFr 9001	44	10.4	43.2	1.00	–
Urbanicity					
Rural	94	16.8	41.3	1.00	–
Small town	91	16.3	45.3	1.18	(0.60–2.31)
Mid-size urban	87	15.6	42.9	1.06	(0.54–2.10)
Large-size urban	286	51.3	43.8	1.11	(0.65–1.88)
Cohabitation					
Lives with partner	122	21.8	34.4	1.00	–
Lives with family	75	13.4	41.2	1.34	(0.66–2.69)
Lives with friends	40	7.2	44.0	1.50	(0.61–3.67)
Lives alone	321	57.5	47.4	1.72**	(1.05–2.80)
Relationship status					
In a relationship	226	40.1	34.7	1.00	–
Not in a relationship	337	59.9	49.8	1.87**	(1.25–2.79)
Venue frequentation					
1st quartile	143	25.5	39.8	1.00	–
2nd quartile	133	23.7	43.6	1.17	(0.68–2.01)
3rd quartile	143	25.5	45.1	1.24	(0.72–2.13)
4th quartile	142	25.3	45.6	1.27	(0.74–2.18)

* Major depression, specific phobia, social phobia, alcohol dependence, and/or drug dependence
** P<.05

Table 2 12-month prevalence of selected DSM-IV disorders, Geneva Gay Men's Health Survey, 2002

	% (SE)
Mood disorder	19.2 (1.7)
Major depression	19.2 (1.7)
Anxiety disorders	21.9 (2.0)
Specific phobia	12.6 (1.6)
Social phobia	13.5 (1.7)
Substance use disorders	16.7 (1.8)
Alcohol dependence	11.4 (1.5)
Drug dependence	7.3 (1.3)
Any disorder	43.7 (2.4)
Pure disorders	
Mood	10.0 (1.5)
Anxiety	12.6 (1.6)
Substance use	8.8 (1.4)
Comorbid disorders	12.4 (1.6)
Mood & anxiety	4.5 (1.0)
Mood & substance use	2.6 (0.8)
Anxiety & substance use	2.4 (0.7)
Mood & anxiety & substance use	2.9 (0.8)

NB: mood=major depression, anxiety=specific and/or social phobia, substance use=alcohol and/or drug dependence

with major depression actually self-reported "depression" and only 38.0% of men with specific and/or social phobia self-reported "chronic anxiety" in the past 12 months. Among those who fulfilled diagnostic criteria and self-reported their disorder, 77.1% had actually been medically diagnosed for major depression and 62.9% for an anxiety disorder.

In addition to the cases, 18.1% only screen positive for major depression, 14.0% for specific phobia, and 12.1% for social phobia. Overall, 34.4% (S.E. 2.3) fulfilled diagnostic criteria for major depression, specific phobia, and/or social phobia, with an additional 24.7% being subthreshold for at least one of those three disorders. Around one quarter of the latter also fulfilled diagnostic criteria for a substance dependence disorder.

■ Socio-demographic correlates of mental disorder

As can be seen in Table 1, most socio-demographic indicators were not significantly associated with the presence of mental disorder in the past 12 months. The only exceptions were increased risk for mental disorder among men who live alone (OR=1.72, 95% CI=1.05–2.80) and men not currently in a relationship (OR=1.87, 95% CI=1.25–2.79). Detailed examination reveals that men who live alone were twice as likely to have major depression (OR=2.10, 95% CI=1.15–3.82) and substance use dependence (OR=2.31, 95% CI=1.12–4.75), and men not currently in a relationship were twice as likely to report major depression (OR=2.37, 95% CI=1.07–5.87) and alcohol dependence (OR=1.97, 95% CI=1.02–3.78). Currently partnered men were less likely to have any disorder—and in particular major depression—regardless of whether they cohabitated with their partner or not.

lation resident in Switzerland, this sample of gay men had fewer men over 55 years, more men with a university-level education, more men living in a large-size urban city, fewer men cohabitating, and fewer men currently in a relationship.

■ Prevalence estimates and self-report

Nearly half (43.7%, 95% CI=39.0–48.4) of the participants sampled fulfilled the criteria for at least one of the five DSM-IV disorders covered in the health survey (Table 2). The most common condition was major depression (19.2%, 95% CI=16.0–22.4). Among those who fulfilled diagnostic criteria, 52.2% of men

Fig. 1 Age of onset for selected DSM-IV psychiatric disorders, Geneva Gay Men's Health Survey, 2002
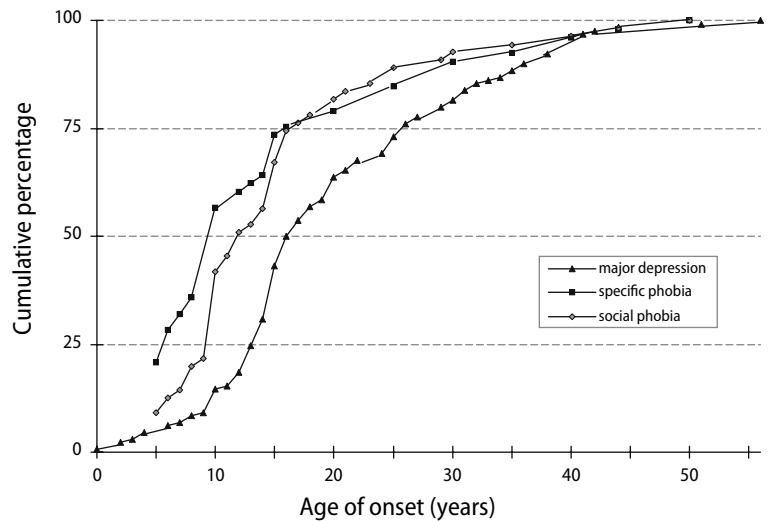
■ Age at onset

Figure 1 shows the cumulative distribution of age of onset for participants with a 12-month diagnosis of mood and anxiety disorders. Among the three conditions covered, most cases of specific phobia (25th percentile 6 years, median 10 years, 75th percentile 18 years) and social phobia (25th percentile 10 years, median 12 years, 75th percentile 17 years) had onset in childhood and adolescence, whereas most cases of major depression (25th percentile 14 years, median 16 years, 75th percentile 26 years) had onset during adolescence and early adulthood. For social phobia, there was a span of only 7 years between the 25th and 75th percentiles.

■ Comorbidity

Comorbidity between the three main categories—mood, anxiety, and substance use disorders—is shown in Table 2. In general, it can be noted for each category that roughly half the cases constituted a pure disorder for that category and the other half a condition comorbid with another category. Among study participants with any diagnosis, 71.6% had a diagnosis in one category only, and 28.4% had diagnoses in two or more categories. Overall, 12.4% [95% CI 9.3–15.5) exhibited psychiatric comorbidity, with the most common condition being comorbid mood and anxiety disorders (4.5%, 95% CI 2.5–6.5).

■ Disability and quality of life

Of the entire sample, 16.7% (S.E. 1.8) reported temporary disability due to a mental health problem in the past 2 weeks. The 2-week disability rate was around 20% of those with pure mood or pure anxiety disorders but twice that (42.3%) for those who manifested comorbid disorders in the past 12 months. The

mean number of disability days was 3.8 days (S.E. 0.5), without any significant differences by type of disorder.

The results for disability and quality of life are shown separately for mood and anxiety disorders on the one hand, and for alcohol and drug dependence disorders on the other in Table 3. While the lowest scores registered were for psychological health, cases also reported lower scores for physical health, social relationships, and their living environment. Men who were subthreshold for mood and/or anxiety disorders took an intermediate position in terms of health outcome, demonstrating significantly greater disability for all indicators than men who did not pass screening.

■ Health services utilization

In the entire sample, 23.6% of the participants reported having seen a health professional in the past 12 months about a mental health problem. However, among those fulfilling diagnostic criteria for a psychiatric disorder, only 35.7% consulted a health professional in the past 12 months for mental health, and 27.5% of all cases actually saw a mental health professional—i.e., psychiatrist, psychologist, and/or psychotherapist—in the past 12 months. Nearly half of the cases had never consulted any providers for mental health in their lifetime.

As evidenced in Table 4, consultation rates differ depending on the disorder profile, with the lowest rates found for pure substance disorder and the highest for pure mood and comorbid disorders. Men who were subthreshold for major depression, specific phobia, and/or social phobia were also significantly more likely to have consulted a health professional for a mental health problem in the past 12 months than men who did not pass screening for those disorders (24% vs. 10%, P<.00001).

Seemingly self-evident, cases who were aware of their disorder—i.e., self-reported—were five times

Table 3 Disability and health-related quality of life (QoL) by psychiatric conditions in the past 12 months, Geneva Gay Men's Health Survey, 2002

	CIDI-SF diagnostic (1)	CIDI-SF screen (2)	No screen (3)	Statistical significance
Major depression, specific phobia, or social phobia (n)	172	104	105	
Very good or good subjective health	83.5%	89.5%	97.1%	.001
Temporary disability due to mental health problem in the past 2 weeks	29.0%	17.3%	6.4%	<.00001
EUROHIS QoL score*	62.0	70.0	76.4	1<2<3
WHOQoL-BREF physical health*	66.1	75.3	82.3	1<2<3
WHOQoL-BREF psychological health*	55.7	67.5	74.8	1<2<3
SF-36 MHI-5 psychological health*	52.5	64.9	74.6	1<2<3
WHOQoL-BREF social relationships*	62.0	66.8	72.5	1<2<3
WHOQoL-BREF environment*	68.7	71.6	76.8	1,2<3
Alcohol or drug dependence (n)	100	255	71	
Very good or good subjective health	87.3%	91.3%	89.0%	.46
Temporary disability due to mental health problem in the past 2 weeks	36.6%	13.7%	10.0%	<.00001
EUROHIS QoL score	65.9	71.3	69.3	1<2
WHOQoL-BREF physical health*	70.1	76.5	74.9	1<2
WHOQoL-BREF psychological health*	60.8	68.0	66.2	1<2
SF-36 MHI-5 psychological health*	59.3	65.8	65.5	1<2
WHOQoL-BREF social relationships*	67.0	69.1	63.8	3<2
WHOQoL-BREF environment*	71.0	73.9	71.0	ns

* Comparison of mean quality of life (QoL) scores on a standardized scale from 0 to 100 for respondents who meet diagnostic criteria (Group 1), who screen positive without fulfilling diagnostic criteria (Group 2), and who screen negative (Group 3), where $P<.05$ using the Tukey test for multiple comparisons—e.g., "1<2<3" indicates that Group 3 is significantly greater than both Groups 1 and 2, and Group 2 is also significantly greater than Group 1

more likely to have sought treatment for their condition in the past 12 months: "depression" (OR=4.77, 95% CI=1.97–11.5) and "chronic anxiety" (OR=4.97, 95% CI=1.95–12.7). Specific data on treatment for substance use were not collected in the study.

Discussion

The present article presents a general overview of psychiatric epidemiology among a probability venue-based sample of gay men in Europe, using standardized instruments of the CIDI family. The results confirm high 12-month prevalence of DSM-IV disorders among gay men evidenced in previous surveys [6, 7, 12, 22]. Indeed, 43.7% (95% CI=39.0–48.4) fulfilled diagnostic criteria for at least one of five disorders examined. Although covering more

Table 4 Consultations with health professionals for mental health by type of psychiatric disorder* in the past 12 months, Geneva Gay Men's Health Survey, 2002

	Consultation with health professional		
	In past 12 months	Prior to past 12 months	Never
No disorder	14.8	18.6	66.7
Pure mood disorder	45.2	11.9	42.9
Pure anxiety disorder	29.4	19.6	51.0
Pure substance use disorder	18.9	27.0	54.1
Comorbid disorders	46.2	21.2	32.7

* Mood disorder: major depression; anxiety disorder: specific phobia, social phobia; substance use disorder: alcohol dependence, drug dependence; comorbid: across two or more of the disorder categories above

psychiatric conditions, 12-month prevalence for any DSM-IV disorders were considerably lower among the male general population in the ESEMeD (9.6%, 95% CI=9.1–10.1) [27] and in the German Health Interview and Examination Survey (GHS) (25.3%, S.E.=1.1) [14]. This remains the case even for age-group prevalences.

An additional 24.7% were subthreshold for major depression, specific phobia, and/or social phobia in the past 12 months yet reported significantly poorer health and quality of life and greater disability and services utilization than men who did not pass screening criteria. Lifetime prevalences are not assessed with the CIDI-SF, but given self-report rates of 39.8% (S.E. 2.3) for depression and 35.5% (S.E. 2.3) for chronic anxiety, these findings further underscore significant psychiatric morbidity. Clearly, gay men should be a priority in public mental health, and conversely, mental health should be a priority for organizations working with gay men.

Despite higher prevalences, the proportion of cases consulting a health professional for mental health reasons (one-third) is comparable to that found in general population studies [1, 14, 25]. However, among those who did consult, it appears that a greater proportion (77%) saw a mental health professional than found in western Europe (two-thirds) [25] or Australia (one-half) [1]. While we did not ask specifically about satisfaction with mental health professionals, satisfaction with health professionals is considerably lower than in the Swiss general population [29]. Therefore, the issue of gay-friendly and culturally competent care may very well also be pertinent for mental health services.

Distinctive features of psychopathology

While inconclusive, the study findings lend support to suggestions that mental disorders may develop and/or progress differently among gay men. Firstly, there is high comorbidity, which is generally associated with poor prognosis and treatment difficulty. With only five conditions, more than one quarter of cases in this study were comorbid across disorder categories compared to 15.5% among men in the ESEMeD [26]. Is increased comorbidity due to higher prevalences or different disease development?

Secondly, gay men with mental disorders appear to exhibit early onset. While the results concur that anxiety disorders set in at an earlier age than mood disorders, the median age at onset is much lower than that in the GHS—16 years in ESE vs. 31 years in GHS for mood disorders and 11 years in ESE vs. 18 years in GHS for anxiety disorders. This discrepancy may be due in part to the age structure of this sample; however, a birth cohort study yielded compelling evidence for higher OR for lifetime psychiatric disorders among gays, lesbians, and bisexuals aged 14–21 compared to heterosexual counterparts [11]. Studies on childhood gender non-conformity [8] show that being different or feeling that one is different happens in early childhood for many gay men and lesbians and may be accompanied by negative judgments [10], engendering noxious effects on mental health and psycho-social resources [2, 9]. In general, early onset is also associated with disease chronicity and greater treatment difficulty.

Finally, most socio-demographic indicators commonly associated with psychiatric disorder—i.e., age, urbanicity, employment status—were not statistically relevant in this sample of gay men. Cohabitation and relationship status—which in general population samples are also consistently related to psychiatric disorder—were correlated independently with psychiatric disorder. While lower rates of cohabitation and partnership may in part account for higher prevalences of psychiatric disorder among gay men, even partnered men exhibited high psychiatric morbidity.

Limitations

As with all studies among gay men, there are important methodological limitations to consider [5]. Cognizant of the difficulties in sampling a numerically small and heterogenous group whose behavior and/or identity are still stigmatized by society at large, the sampling basis consisted of meeting points in Geneva where gay men and other men who have sex with men meet one another for leisure, socializing, and sex. While probability permits a certain degree of representativity within the sampling scheme, these results cannot be generalized to gay men who fall outside it—i.e., men with no contact to any physical or virtual venues. A recent methodological paper confirmed that time-space sampling provided robust coverage of gay men resident in an urban area [21].

The actual rate of venue frequentation is a potential bias as frequent visitors have a higher probability of being recruited into the study. However, venue frequentation over the past 12 months—when quantified—did not distinguish significantly for any of the study variables, including the psychiatric disorders covered here. Physical and virtual venues have heightened importance in many gay communities as meeting points and safe spaces. Importantly, as seen in the response to the HIV/AIDS epidemic, they can serve as effective entry points for health intervention delivery.

Practical implications

The findings raise questions about the reasons and specific approaches to treatment and prevention of psychiatric disorders and mental health promotion among gay men. The relationship between psychiatry and homosexuality has not been easy [5], but the fact that such research takes place in a politicized context is not exclusive to either mental health as a subject area nor gay men as a target group. Identifying and understanding deficits are crucial in ensuring that adequate resources are invested where the need is greatest.

The accumulated evidence suggests strongly that sexual orientation should be ascertained in all large psychiatric epidemiological surveys. However, due to the small numbers of gay men in many such samples to date, such studies need to be supplemented by well-designed surveys in gay communities utilizing robust methods—e.g., probability sampling and diagnostic assessment of psychiatric disorders. In a population with such high mental morbidity, a full-length psychiatric epidemiological survey covering more conditions as well as lifetime prevalences would also benefit from the psychometric properties of the full CIDI, permitting more nuanced analyses across threshold levels.

Addressing the question of why greater psychiatric morbidity, other findings from the health survey reveal considerable morbidity and vulnerability in many other health domains [29] which point to the saliency of looking at multi-morbidity or syndemics to better understand the global and specific health issues of gay men [23]. But while attention to issues such as psycho-social resources and socio-environmental stressors may very well shed further light on this question [17, 18], indicators specific to sexual orientation may be particularly informative, as such variables are not collected in large national surveys. Future analyses with this dataset will explore these questions.

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