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The South African Community Epidemiology Network on Drug Use (SACENDU): description, findings (1997–99) and policy implications

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ABSTRACT

Aims To (1) describe the South African Community Epidemiology Network on Drug Use (SACENDU), (2) describe trends and associated consequences of alcohol and other drug (AOD) use in South Africa for January 1997 to December 1999 and (3) outline selected policy implications identified by SACENDU participants.

Methods A descriptive epidemiological study of AOD indicators based on data gathered from multiple sources, including specialist treatment centres, trauma units and quantitative studies of target groups such as school students and arrestees. Networks were established in five sentinel sites to facilitate the collection, interpretation and dissemination of data.

Results Over time alcohol has been the most frequently reported primary substance of abuse across sites. Trauma and psychiatric data highlight the burden associated with alcohol abuse. Cannabis and Mandrax (methaqualone), alone or in combination, are the most frequently reported illicit drugs of abuse, generally comprising the largest proportions of drug-related arrests, drug-related psychiatric diagnoses and drug-positive trauma patients. From 1997 to 1999, a significant increase in indicators for cocaine/crack and heroin occurred in two sites. Ecstasy (MDMA) use, alone or in combination with other substances, is reported among young people.

Conclusions A broad range of globally abused substances is present in South Africa and the use and burden of illicit substances appears to be increasing. This points to the importance of ongoing monitoring of AOD trends. Through regular, systematic data collection the SACENDU project has made available more evidence-based information to direct AOD abuse policy and practice and has had an impact on research agendas.

KEYWORDS AOD use, consequences, epidemiology, South Africa, surveillance.

INTRODUCTION

In 1998, the United Nations called for drug demand reduction programmes to be based on regular assessment of the nature and magnitude of drug consumption and drug-related problems in the population (Commission on

Narcotic Drugs 1998). In March 2000, the need for a sound evidence base to facilitate effective responses to drug problems was acknowledged further by the Commission on Narcotic Drugs. In particular, multi-method and multi-source approaches to data collection were identified as being of value in the analysis of drug

use patterns and the consequences associated with drug use (Commission on Narcotic Drugs 2000).

Despite the acknowledged value of multi-source and multi-method data, many countries have relied on national surveys as the principal means of describing alcohol and other drug (AOD) use. Although national surveys have a number of advantages (e.g. generalizability of findings to the broader population), they typically have several methodological limitations (e.g. insensitivity to local patterns of AOD use). The use of data obtained from multiple sources and methods helps overcome many of the limitations associated with the use of a single research method (World Health Organization 2000).

AOD reporting systems which collect, collate and disseminate information from all available sources for a given area (usually a large urban centre) are known as aggregate systems. Aggregate systems typically include data from event registers, case reporting and case register systems (World Health Organization 2000). This city-level data may be combined with data from other cities, forming a multi-city system.

Community epidemiology surveillance networks are the most common form of the aggregate system. Network members consist of clinicians, researchers and policy makers who contribute to and evaluate information about drug use in specific geographic areas. Network meetings are scheduled regularly and provide a forum for the sharing, review, and analysis of epidemiological data (National Institute on Drug Abuse 1998). Local epidemiological networks address many of the difficulties associated with national surveys: they are cost-effective as they rely largely on existing resources; they limit the masking of location-specific differences; they use local data, increasing the likelihood of relating findings to specific denominator information; they help inform specific actions against AOD-related problems in local community settings; there are increased opportunities for checking data validity as data are gleaned from multiple sources; and the networks are sustainable, providing infrastructure for further research at a local level (Sloboda & Kozel 1999). These local networks are also valuable in developing countries, where national surveys are, at best, conducted infrequently. In South Africa, for example, the last national AOD survey that included all population groups was undertaken in 1985 (Rocha-Silva 1991). In such contexts, local epidemiological networks provide sustainable sources of information on AOD trends.

Despite the large number of AOD surveillance systems worldwide and the importance of disseminating data on AOD trends, there have been few published reports in peer-reviewed journals describing AOD surveillance systems. Notable exceptions are Hando *et al.*'s (1998) report on the Australian Illicit Drug Reporting System, Siegal *et al.*'s

(2000) brief report on the Ohio Substance Abuse Monitoring Network and Griffiths *et al.*'s (2000) report on drug information systems. This paper hopes to complement this literature by describing the South African Community Epidemiology Network on Drug Use (SACENDU) project and its application to the South African context. The paper will: (i) describe the SACENDU project; (ii) describe both the trends and the associated consequences of AOD use in South Africa between January 1997 and December 1999, and (iii) outline selected policy implications identified by the network members.

The South African Community Epidemiology Network on Drug Use

SACENDU was established in 1996 by the Medical Research Council of South Africa (MRC) and the University of Durban-Westville. SACENDU is a network of researchers, practitioners and policy-makers from five sentinel sites in South Africa. Three of the sites are large port cities {Cape Town, Durban and Port Elizabeth (PE)} and two are provinces (Gauteng, a largely urban province that includes the cities of Pretoria and Johannesburg; and Mpumalanga, a mostly rural province). These sites have a combined population of approximately 16 million people, which comprises 36% of the total South African population (Statistics South Africa 1998).

METHOD

In 1996, the SACENDU project was initiated in Cape Town and Durban. PE, Gauteng and Mpumalanga joined the network in 1997, 1998 and 1999, respectively. Networks of relevant stakeholders were established in each site. Data are gathered regularly from a variety of sources.

Specialist AOD treatment centre data

Treatment data are collected from more than 50 specialist AOD treatment centres, which include state-funded, private and non-government institutions. All AOD treatment centres, located within a given site, are requested to join the network. Participation within the network is voluntary. Nationally, data are collected from about two thirds of all AOD treatment centres, and from more than 80% of treatment centres in each site. The annual caseload across all five sites is approximately 10 000. Specialist AOD treatment centres tend to be more urban-based and access tends to be biased towards white, coloured and Asian South Africans; however, access to treatment for black/African South Africans is increasing. For example, in the second half of 1999, 42% of patients

receiving substance abuse treatment in Mpumalanga were black/African. A standardized one-page form is completed on each person treated by a given centre during a particular 6 month period. The form consists of forced-choice responses about the source of referral for treatment, biographical information, type of treatment received (inpatient and/or outpatient), the primary and secondary substances of abuse,¹ the mode of use and whether the person had received treatment prior to the current episode. Treatment centre staff regularly receive training in data collection procedures. To ensure data quality, completed forms are checked for missing information and possible miscodes, and feedback is given to staff to prevent the problem from re-occurring.

Substance-abuse-related admission/discharge diagnoses reported by acute psychiatric facilities

Since July 1997, the proportion of psychiatric admissions/discharges relating directly to substance abuse, together with the type of substances being abused, have been recorded in psychiatric hospitals in Cape Town and PE. From July 1999, institutions from Gauteng were included. Substance-abuse-related discharge diagnoses are made by trained psychiatrists and clinical psychologists, based on DSM-IV guidelines.

AOD-related trauma unit admission data collected via self-report measures and biological markers (breath alcohol measures and urine testing)

As part of an ongoing project, initiated in 1999, patients admitted to trauma units in state-funded hospitals in Cape Town ($n = 236$), PE ($n = 235$) and Durban ($n = 205$) were interviewed about their illicit drug use using a specially constructed questionnaire. The internationally validated CAGE questionnaire was used to assess problem drinking. In addition, a locally manufactured multi-drug screening kit was used to test the urine for the presence of various illicit drugs. The reliability of the kit was assessed by comparing cannabis results with conventional pharmacological assessments, and the kit was found to have a 95% reliability. Pharmacological wet analyses were also used to test for the presence of methaqualone. The Lion Alcolmeter S-D2, which had been validated in previous studies (Peden *et al.* 2000), was used for breath alcohol analyses.

Other studies

Representative studies of the AOD use behaviours of high school students were conducted in Cape Town in 1997

¹Responses to these two items are not forced-choice

($n = 2379$) (Flisher *et al.* 2002), Durban in 1998 ($n = 3030$) (Bhana *et al.* 1999) and Port Elizabeth in 1999 ($n = 2334$). Based on the methodology used by the IIS Arrestee Drug Abuse Monitoring (ADAM) Project, the three-metros arrestee study, monitoring the link between drug use and crime, was initiated in 1999. During phase 1 (August–September 1999) of the three-phase project, 967 consenting arrestees from three cities (Cape Town, Durban and Johannesburg) were interviewed about their AOD use and the EMIT test was used to screen urine samples for the presence of various drugs.

RESULTS

Monitoring of treatment demand at specialist treatment centres

Alcohol is the most common primary drug of abuse across all sites. The demand for treatment of alcohol abuse, as a proportion of the total demand for substance abuse treatment, ranged from 55% to 74% in Durban, Gauteng and Port Elizabeth from 1997 to 1999 and remained stable at 76% in Mpumalanga during 1999 (Table 1). In Cape Town, treatment demand for alcohol abuse decreased significantly from 82% to 50% ($\chi^2 = 661.05$; $df = 1$; $P < 0.001$) over the 3 year period.

Across sites, cannabis alone or cannabis smoked together with Mandrax (known as a 'white pipe') is the second most common primary substance of abuse. Mandrax is a synthetic sedative-hypnotic which acts as a central nervous system depressant. Although there have been no discernable trends in the treatment demand for cannabis abuse, marked geographic differences in the treatment demand for white pipe abuse have emerged, with treatment demand being consistently highest in Port Elizabeth (ranging from 20% to 30% of total admissions) and Cape Town (accounting for 20% of the total treatment demand in Cape Town for 1999), while over time accounting for no more than 5% of the total treatment demand in Gauteng. In Durban, treatment demand for white pipe-related problems decreased substantially in 1999, to less than 1% of the total treatment demand (Table 1).

From 1997 to 1999, treatment demand for cocaine (including crack cocaine) abuse, as a proportion of the total demand for substance abuse treatment, increased in all sites. The Mantel–Haenszel trend test revealed a significant increase in the proportion of patients reporting cocaine as their primary drug of abuse in Cape Town, from 3.6% to 8.9% ($\chi^2 = 81.82$; $df = 1$; $P < 0.001$), and in Gauteng, from 8.0% to 10.5% ($\chi^2 = 11.39$; $df = 1$; $P < 0.01$) (Table 1).

Since 1997, less than 1% of patients in Durban, Port Elizabeth and Mpumalanga had heroin as their primary drug of abuse. However, from 1997 to 1999, a significant

Table 1 Proportion of patients from specialist treatment centres by primary substance of abuse: January 1997 to December 1999 (% positive).

Area	Alcohol (%)	Cannabis (%)	White pipes ¹ (%)	Cocaine (%)	Heroin (%)	Ecstasy (%)	OTC ² (%)	n
Cape Town								
97-a	82	5	7	4	<1	<1	2	2105
97-b	78	6	9	4	<1	1	1	2162
98-a	74	5	10	6	2	<1	2	2301
98-b	64	9	14	8	2	<1	2	1361
99-a	56	9	20	8	4	1	2	1527
99-b	50	15	20	9	3	<1	2	1550
Durban								
97-a	69	9	7	1	<1	<1	1	601
97-b	62	21	6	3	1	1	3	817
98-a	61	16	11	9	3	3	2	817
98-b	69	20	6	1	0	0	<1	242
99-a	57	30	<1	6	1	1	1	682
99-b	65	23	<1	9	0	0	1	607
Port Elizabeth								
97-a	58	23 ³		<1	<1	<1	5	316
97-b	66	20		<1	<1	<1	3	416
98-a	74	22		0	0	<1	3	380
98-b	68	23		1	0	0	8	261
99-a	55	30		2	1	0	11	341
99-b	63	29		1	0	0	7	328
Gauteng								
98-a	69	11	5	8	<1	<1	4	2125
98-b	68	12	4	9	2	<1	4	2372
99-a	67	10	4	10	3	<1	4	2741
99-b	63	14	5	11	3	<1	3	2613
Mpumalanga								
99-a	76	13	1	3	<1	<1	3	325
99-b	76	15	2	2	<1	<1	1	376

¹Cannabis and Mandrax (methaqualone) use are not identified separately by treatment staff in Port Elizabeth, as these substances are largely used together at this site.

²Cannabis and Mandrax combination.

increase in the treatment demand for heroin abuse occurred in Cape Town (from 0.8% to 3.4%; $\chi^2 = 51.49$; $df = 1$; $P < 0.001$) and Gauteng (from 0.7% to 2.9%; $\chi^2 = 31.69$; $df = 1$; $P < 0.001$) (Table 1).

Across sites and over time, the proportion of patients in treatment reporting ecstasy (MDMA), LSD or speed (methamphetamine) as their primary drug of abuse has been limited. Since 1997, treatment demand for ecstasy as the primary drug of abuse has been stable, accounting for no more than 3% of the total demand for substance abuse treatment at any site (Table 1). Over time, more patients presented for the treatment of ecstasy-related problems than for problems related to the use of other club drugs. Club drugs are mainly reported as secondary drugs of abuse and are typically used in combination with other substances.

Although there is a demand for the treatment of over-the-counter (OTC) and prescription medicine abuse in all

sites, treatment demand has been consistently highest in Port Elizabeth. From 1997 to 1999, treatment demand for problems related to medicine use increased in Port Elizabeth, but decreased in Cape Town and stabilized in Durban and Gauteng (Table 1). Benzodiazepines and analgesics are the most common classes of medicines that are abused in South Africa.

Across sites and over time, the mean age of patients in treatment with alcohol as their primary substance of abuse ranged from 37 to 42 years. This is older than the mean age for other substances of abuse. The mean age of patients with cocaine as their primary substance of abuse ranged from 28 to 30 years. From 1997 to 1999, the mean age of patients in treatment for heroin abuse decreased in both Cape Town and Gauteng from 29 to 23 years.

Across sites and over time consistently more males than females reported alcohol, cannabis and white pipes

as their primary substances of abuse, with the proportion of females reporting alcohol and cannabis/Mandrax as their primary substance of abuse ranging from 15% to 23% and 4% to 18%, respectively. A higher proportion of females seek treatment for cocaine and heroin as their primary substance of abuse compared to other illicit drugs. Females comprise 20% to 25% of patients in treatment for cocaine and 25% to 40% of patients in treatment for heroin-related problems, respectively. Consistently more females than males have OTC/prescription medicine as their primary substance of abuse.

Heroin is mainly smoked in South Africa, although up to 45% of patients in Cape Town and up to 38% of patients in Gauteng with heroin as their primary substance of abuse reported some injection use in the second half of 1999.

Substance abuse surveillance by acute psychiatric facilities in Cape Town, Port Elizabeth and Gauteng

From 1997 to 1999, the admission/discharge diagnoses of patients treated in psychiatric inpatient units indicate that 5–26% of patients in Cape Town, 6–10% of patients in Port Elizabeth and 10–16% of patients in Gauteng had some form of alcohol-related disorder. Cannabis is the most common illicit drug of use in this population. From the second half of 1998, depending on the particular 6-month reporting period, 40–60% of psychiatric patients in Port Elizabeth reported the use of cannabis.

Sentinel surveillance of trauma and substance abuse in three cities (Cape Town, Durban and Port Elizabeth)

In 1999, 44–46% of trauma patients in state hospitals in Durban and Cape Town had positive breath alcohol concentration (BrAC) levels, with more than 34% of patients having a BrAC level greater than 0.05 g/100 ml (the legal limit for driving). In Port Elizabeth, 67% of trauma patients had BrAC levels over 0.05 g/100 ml. In addition, 42.7%, 32.7% and 34.4% of patients in Port Elizabeth ($n = 235$), Cape Town ($n = 236$) and Durban ($n = 205$), respectively, tested positive for cannabis and 13.2%, 22.0% and 11.5% of patients in Port Elizabeth, Cape Town and Durban, respectively, tested positive for Mandrax. Furthermore, 2.5% and 3.3% of trauma patients in Durban and Cape Town, respectively, tested positive for cocaine.

Selected findings from other sources

A representative survey of 38 state schools in Cape Town in 1997 found that 37% of males and 19% of females in grade 11 reported binge-drinking in the 2 weeks prior to the study. In a 1998 study of 39 schools in Durban, 53%

of males and 29% of females in grade 11 reported binge-drinking in the 2 weeks prior to the study. A survey of 32 state schools in Port Elizabeth in 1999 noted that 58% of male and 43% of female students reported binge-drinking in the 2 weeks prior to the study. In addition, a life-time prevalence for cannabis use of 4% for female and 11–16% for male grade 11 students in Cape Town and Durban was found. The life-time prevalence for Mandrax use was 0% to 2% for female and 4% to 6% for male grade 11 students in Cape Town and Durban. In Port Elizabeth a life-time prevalence of 12% for cannabis and 2% for Mandrax was reported. Furthermore, in Cape Town a life-time prevalence rate for the use of ecstasy of 4% for male and 3% for female grade 11 students was reported.

Phase 1 of the three-metros arrestee study revealed that 57.4%, 45.5% and 29.0% of arrestees in Cape Town ($n = 302$), Durban ($n = 241$) and Johannesburg ($n = 320$), respectively, tested positive for cannabis metabolites. In addition, 42.1%, 26.3% and 8.7% of arrestees in Cape Town, Durban and Johannesburg, respectively, tested positive for Mandrax metabolites. Across sites, the use of cannabis and Mandrax appears to be linked to property offences (with 66.7% of persons charged with housebreaking testing positive for cannabis and 54.7% testing positive for Mandrax) and violent crime (with 52.4% of people charged with murder testing positive for cannabis and 23.8% testing positive for Mandrax). In addition, 3.3%, 3.7% and 4.9% of arrestees in Cape Town, Durban and Johannesburg, respectively, tested positive for cocaine.

DISCUSSION

Since the start of surveillance in 1996, SACENDU has provided evidence about the types of substances used and abused, trends in AOD use and abuse, associated consequences of AOD use and patterns of supply and demand in South Africa. This information about trends in substance use and its associated consequences not only helps to address the paucity of knowledge about the epidemiology of substance use in South Africa, but is vital for guiding the formation and implementation of effective AOD demand reduction programmes.

Trends in AOD use, identified by SACENDU, demonstrate that alcohol is the most common primary substance of abuse in South Africa. This mirrors AOD use trends among black South Africans between 10 and 21 years of age and among black South Africans over 14 years of age (Rocha-Silva, de Miranda & Erasmus 1996). Across sites, the demand for treatment of AOD-related problems is consistently dominated by alcohol, with the exception of Cape Town. It is likely, however, that the decreasing demand for alcohol abuse treatment in

Cape Town is only partly a consequence of the closure of a large, exclusively alcohol, treatment centre at the end of 1998. Despite taking the closure of this treatment centre into consideration, the proportion of treatment demand for alcohol has continued to decrease since 1998. A possible explanation for this decreased demand is the proportional increase in treatment demand for other substances of abuse. It is, however, unlikely that the abuse of alcohol has decreased in the general population. This explanation appears to be confirmed by other demand indicators which indicate that alcohol misuse remains stable at a consistently high level in Cape Town. Across all sites, trauma and psychiatric data confirm the enormous costs of alcohol misuse to the economy, society and the individual. This is demonstrated further by school survey data which indicate a high level of harmful alcohol use among South African youth. The high rate of binge-drinking among young people is cause for concern given the significant associations found between binge-drinking, academic failure and high-risk sexual behaviour (Fisher *et al.* 2002). Although the national government has been slow to respond to these alarming data, the close relationship between SACENDU members and policy makers is being used to ensure that alcohol is kept high on the policy agenda.

Cannabis and the cannabis/Mandrax combination are the second and third most common primary drug of abuse in treatment settings. This tends to confirm findings among the general population of black South Africans over 14 years of age (Rocha-Silva 1991). Treatment data, however, provide a poor picture of use in the general population. Cannabis is used by all sectors of society as it is inexpensive and easy to procure. Possession of cannabis, while illegal, is enforced infrequently. Many sectors of South African society do not perceive cannabis to be a drug that gives rise to problems and the use of cannabis is therefore not seen as problematic and necessitating treatment. However, SACENDU's treatment demand, psychiatric, trauma unit and arrestee data reflect the potential cannabis misuse has to burden the health, social welfare and criminal justice systems of South Africa. Although the white pipe combination is used less widely, it is endemic to certain geographic regions, specifically the Eastern and Western Cape, where it is associated with the prevalent gang culture. This is confirmed by the consistently high treatment demand for problems associated with white pipe use in Port Elizabeth and Cape Town, as well as the high rates of Mandrax-positive arrestees and trauma patients in Cape Town, relative to other sites.

With South Africa's first democratic elections in 1994 and subsequent re-entry into the international community, South Africa has become, due to its geographic location, a convenient trans-shipment point for heroin

and cocaine. Since the last general population survey was conducted among black South Africans in 1985 (Rocha-Silva 1991), there have been major increases in the availability of both cocaine and heroin. The significant increases in treatment demand for heroin and cocaine abuse in the larger metropolitan areas of Cape Town and Gauteng since the start of AOD surveillance indicate that these are emerging problem drugs of abuse for South Africa. The preferred route of heroin administration among South African users remains smoking. However, up to 45% of heroin users in treatment in Cape Town and Gauteng report some injection drug use. It is thus important for SACENDU to continue to monitor modes of heroin administration, especially as some Asian countries have reported rapid shifts from smoking heroin to injection use, particularly in response to decreased purity levels of street heroin (Asian Multi-City Epidemiology Work Group 1999). In addition, policy makers need to consider the consequences of increased rates of injection drug use, which include the spread of infectious diseases (such as HIV, hepatitis B and C) through direct and indirect sharing of injection equipment. An injection drug use epidemic in South Africa will provide an additional major HIV transmission route, placing a considerable burden on a health care system already under strain from a population HIV/AIDS prevalence rate of more than 10% (Department of Health Directorate 2001).

In addition to providing information on trends in AOD use and abuse, SACENDU has been instrumental in building research capacity, stimulating AOD-related research in new or under-researched areas (e.g. trauma patients, arrestees, sex-workers and street children), thus providing new data that can be used to inform policy and planning decisions and providing opportunities for AOD-related research funding. More specifically, SACENDU has made a number of suggestions for South African substance abuse policy that include increasing the number of AOD treatment options, especially among marginalized groups; providing substance abuse practitioners with specific treatment protocols for specific drugs of abuse; developing protocols for the identification, management and treatment of patients in general hospitals, primary health-care settings, trauma units as well as arrestees with substance abuse problems; and developing age-appropriate AOD prevention programmes.

Although SACENDU has achieved many of its objectives, the data sources relied upon are not without their limitations. Ensuring participation by all treatment centres during each phase of data collection is, in some instances, difficult, as data collection is dependent mainly on the enthusiasm of individuals who receive no remuneration for their efforts. Data collection is currently largely descriptive and to date there has been little attempt to use SACENDU data for analytical research

such as monitoring and evaluating the impact of AOD interventions. Treatment centre data may, moreover, reflect admission policies, differential access to services based on socio-economic status and the limited availability of treatment services for marginalized groups rather than potential substance abuse treatment demand. This raises questions about the validity of treatment demand indicators. However, the use of contextual information gathered at the network meetings helps ensure the validity of data interpretation, the examination of data trends over lengthy time periods helps reduce potential biases emerging from the influence of extraneous factors, and the use of multiple data sources provides evidence of convergent validity through confirmatory findings from multiple data sources. For example, the finding that treatment demand for alcohol abuse had decreased significantly in Cape Town from 1998 was explained only partly in terms of the closure of a large alcohol only treatment centre rather than a real reduction in treatment demand. This explanation was based on feedback from network members as well as confirmatory findings from psychiatric, trauma and school studies which did not show a sharp decline in alcohol use indicators for Cape Town. Nevertheless, as data on alcohol and drug use trends for the general population are not available in South Africa, it remains difficult to determine the extent to which findings reported by SACENDU can be extrapolated to the general population. In order to improve the reliability and validity of SACENDU's trend data in the future, it is imperative that a national survey is conducted on AOD use among the general population.

CONCLUSION

Despite South Africa's geographical distance from North America, Europe and Asia and previous social and political isolation, findings by SACENDU show that a broad range of globally abused substances is present in South Africa. Although idiosyncrasies remain in the South African drug markets (such as the use of white pipes as one of the primary drugs of choice), the profile of drug use in South Africa has shifted dramatically since the transition to democracy, with cocaine powder, crack cocaine, club drugs and heroin emerging onto South African drug markets. Unlike Europe, Asia and North America, heroin and cocaine are not South Africa's main problem drugs of abuse and the prevalence of cocaine and heroin use is substantially lower than for the rest of the world. Nevertheless, the use of these illicit substances appears to be increasing and given the negative health and social consequences associated with cocaine and heroin abuse, the use of these drugs requires careful monitoring by SACENDU in the future.

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