ICAP International Center for Alcohol Policies
Analysis. Balance. Partnership.

GLOBAL ACTIONS ON HARMFUL DRINKING

MONOGRAPH

Producers, sellers, and drinkers

Studies of noncommercial alcohol in nine countries

The International Center for Alcohol Policies (ICAP; www.icap.org) is a not-for-profit organization supported by major international producers of beverage alcohol. Established in 1995, ICAP's mission is to promote understanding of the role of alcohol in society and to help reduce harmful drinking worldwide. ICAP's efforts to foster dialogue and partnerships in the alcohol policy field are shaped by its commitment to pragmatic and feasible solutions to reducing harm that can be tailored to local and cultural considerations and needs. ICAP has been recognized by the United Nations Economic and Social Council (UN ECOSOC) as a non-governmental organization in Special Consultative Status.

International Center for Alcohol Policies (ICAP)
1519 New Hampshire Avenue, NW
Washington, DC 20036 USA
Phone: +1.202.986.1159
Fax: +1.202.986.2080
www.icap.org

Global Actions on Harmful Drinking is a consortium of initiatives dedicated to helping reduce the harmful use of alcohol. This work is the result of a collective commitment made by the chief executives of major international beverage alcohol producers to make a significant effort to address harmful drinking through a combination of global and local actions, with an emphasis on low- and middle-income countries.

The Global Actions on Harmful Drinking initiatives are being coordinated by ICAP.

For more information about Global Actions on Harmful Drinking, please visit www.global-actions.org or e-mail info@global-actions.org

Suggested citation for this publication is as follows:

International Center for Alcohol Policies (ICAP) (Ed.). (2012). *Producers, sellers, and drinkers: Studies of noncommercial alcohol in nine countries* [Monograph]. Washington, DC: Author.

Contents

Introduction 3

Belarus 7

Botswana 13

Brazil 19

China 25

India 33

Kenya 39

Mexico 45

Russia 49

Sri Lanka 55

Introduction

A significant proportion of all alcohol consumed globally is not reflected in official statistics, such as production, trade, and sales figures. These beverages fall into the general category referred to here as "noncommercial" alcohol. The term was chosen in order to differentiate these beverages from alcohol drinks that are produced legally according to set standards, are regulated, and are sold commercially and legally (Adelekan, Razvodovsky, & Liyanage, 2008). "Noncommercial alcohol" also differs from what the World Health Organization (WHO, 2011) has termed "unrecorded alcohol," which also includes legal commercial beverages that are traded across borders through import exemptions and duty-free sales, as well as smuggling, tourist consumption, and beverages with an alcohol content below that used in legal definitions of products.

Noncommercial alcohol includes traditional home-produced drinks produced legally or illegally for home consumption or limited local trade. The array of such beverages is wide and colorful, and their quality, while variable, is generally high. Their production is often seasonal and coincides with the harvesting and availability of particular agricultural products. As a result, these beverages reflect the raw materials that are present in particular regions, such as grains, corn, tubers, stone fruits, grapes, sugarcane, date palm, and agave, among others.

Also included in the definition of noncommercial alcohol are unregistered alcohol beverages produced illegally in large volume, usually falling into generic categories such as "vodka" or "whiskey," and sometimes associated with organized crime. These may include counterfeit beverages, often of low quality, which are packaged to resemble legal beverages, often imported ones. Finally, noncommercial alcohol includes consumption of surrogate alcohol, typically derived from nonpotable medicinal or industrial liquids containing ethanol or other types of alcohol such as methanol or isopropanol. These types of liquids are associated with negative health outcomes and can result in poisoning and even death.

Noncommercial alcohol is available in some form in virtually every country where alcohol beverages are consumed. Its production and consumption are closely linked with discrete social, cultural, and economic issues. Yet despite the wide prevalence of noncommercial alcohol, there is a dearth of information about it (Macdonald, Wells, & Giesbrecht, 1999; Haworth & Simpson, 2004; McKee, Adany, & Leon, 2012). Official statistics are difficult to obtain, given its unrecorded nature. What data are available are generally estimates and, as such, unreliable. The complexity of the topic means that little empirical research is available. WHO (2004, 2011) estimates that unrecorded alcohol accounts for nearly 30% of all alcohol consumed globally, at least two-thirds of all alcohol on the Indian subcontinent, and over 90% of all alcohol in East Africa. There is, therefore, an urgent need to fill this gap in our understanding of the noncommercial alcohol sector.

"Noncommercial alcohol" includes traditional drinks produced for home consumption or limited local trade, unregistered and counterfeit products, and nonpotable surrogate alcohol.

Global Actions on Harmful Drinking

In 2009, the chief executives of several major international alcohol beverage producers and organizations[1] agreed to launch Global Actions on Harmful Drinking, a set of initiatives intended to help reduce harmful drinking in a number of low- and middle-income countries. Among the initiatives was a major international research program to examine and describe the noncommercial alcohol market in nine countries: Belarus, Botswana, Brazil, China, India, Kenya, Mexico, Russia, and Sri Lanka. These countries were selected primarily because of the high prevalence of local alcohol on the market, but also because of their geographic diversity.

In May 2009 the International Center for Alcohol Policies (ICAP) organized a meeting attended by international experts on alcohol issues and research methodologies.[2] One of their most important objectives was to produce the necessary elements to be included in a comprehensive, feasible methodology that would be valid across cultures. Smaller working groups met during the course of 2009 to further refine the methodology and scope of the project and to help identify research partners.

Project parameters

The objective of the Global Actions research project on noncommercial alcohol was to measure the nature and extent of unrecorded alcohol production and consumption in each country. For data collection, investigators were advised to use instruments such as consumer diaries (the most commonly used method), a rapid situation assessment, and population-based cross-sectional surveys. It was recommended that sample groups be drawn from both rural and urban settings, include at least 200–250 respondents representative of the general population, and address a few subpopulations of interest (e.g., individuals in treatment for alcohol problems, indigent persons, or young people). Where local facilities were available and capable of conducting chemical analysis of samples, it was recommended that they follow AMPHORA Project methodology (see Lachenmeier et al., 2011) and include an assessment of a fixed set of potentially risky compounds.

Implementation

Local research teams in each of the nine countries sought to examine the production, sale, consumption patterns, and implications of the noncommercial alcohol sector. Following a pilot phase in which the methodology was tested in each country and the instrument adapted to meet local requirements and conditions, the teams conducted surveys in urban and rural areas on the nature of the noncommercial alcohol market, examining its producers, sellers, and consumers. Given the scope of the market, data gathering was confined to specific areas in each country, except in Botswana and Sri Lanka, where research teams were able to interview consumers across the entire country.

This monograph presents an overview of these investigations. Each chapter, authored by the teams that conducted the research, lays out the broad context in each country, provides a description of the methodology followed, and discusses the key findings. The reports from the four countries where investigators were able to include a chemical analysis component provide information on alcohol content, composition, and the presence of contaminants in a sample of beverages collected during the research.

Findings

In very general terms, the studies revealed that a typical consumer of noncommercial alcohol is male, over 30 years of age, resides in a rural area, and has limited financial resources. In several countries, a large number of consumers have a low level of education and work as unskilled laborers.

According to consumers, the most consistent reasons for consuming noncommercial

1 The sponsors are Anheuser-Busch InBev, Bacardi, Beam Inc., Brown-Forman Corporation, Constellation, Diageo, Heineken, Molson Coors Brewing Company, Pernod Ricard, SABMiller, UB Group, Brewers Association of Japan, and Japan Spirits & Liqueurs Makers Association. See http://www.global-actions.org/ for more information on Global Actions.

2 The experts were Moruf Adelekan, Royal Blackburn Hospital, United Kingdom; Vivek Benegal, National Institute of Mental Health and Neurosciences (NIMHANS), India; Dirk Lachenmeier, Chemisches und Veterinäruntersuchungsamt Karlsruhe, Germany; Uditha Liyanage, Postgraduate Institute of Management, Sri Lanka; Dusan Nolimal, independent consultant, Slovenia; Yury Razvodovsky, Grodno Medical University, Belarus; and Jürgen Rehm (in advisory capacity), Centre for Addiction and Mental Health, Canada.

alcohol instead of commercial beverages are price and availability. In rural areas of some countries, legal commercial products tend to be scarce or unaffordable to many consumers. Most study sites revealed the presence of local noncommercial alcohol production using easily obtained ingredients, such as local grains and fruits. Products were distilled, brewed, or fermented depending on the country and the local culture. In China, a country that has a long tradition of noncommercial alcohol production, the investigators focused exclusively on distilled spirits in three provinces but noted that hundreds of different noncommercial products exist across the country.

In all country studies, noncommercial alcohol was found to be significantly cheaper than commercial alcohol. About half of the respondents in Botswana, for example, reported earning less than BWP 300 pula (USD $40) a month, while two-thirds of respondents in Kenya reported earning less than KES 4,000 shillings ($47.60) a month. While price is an important factor behind noncommercial alcohol consumption, it is not the only factor, as mentioned in several studies. Respondents in Russia cited low price and "to enjoy company" as motives for consumption. Taste and sociability were also mentioned in China and Brazil.

Tradition and beverage quality were also cited as reasons for consuming noncommercial beverages. In Botswana, consumers and community leaders described both the sorghum/millet-based beer *bojalwa jwa Setswana* and the fruit-based wine *khadi* as "traditional," "wholesome," and "socially acceptable," but *bojalwa jwa Setswana* was regarded as the primary traditional drink and enjoyed wider public acceptance, especially during traditional feasts. Investigators in India note that noncommercial beverages are assimilated into the culture and tradition of the region of Sikkim and are consumed by men and women from all socioeconomic levels, particularly during festivals, religious occasions, and family celebrations.

Since there is often a perception that noncommercial alcohol may be associated with questionable quality, it was interesting to learn the perspectives of producers and sellers about their trade. Some of the small-scale producers interviewed, such as those in Kenya, used unsophisticated production methods and were engaged in production because they were poor and needed to earn a living. In Sri Lanka, some said they would leave the business if other work could be secured. Producers in most countries were aware of the potential harm that is associated with toxic products. Several producers in various countries indicated that they were not willing to risk their reputations by making products that were low quality or that made consumers ill.

A similar attitude was observed among sellers. In Russia, for example, sellers of noncommercial alcohol were generally of lower socioeconomic status. In many cases they knew the producers of the products they were selling and were not inclined to sell toxic or bad batches. While it may be unlikely that a seller or a producer would admit to purposely adulterating a beverage, they are largely poor and their need for an income is paramount. Therefore, it is equally unlikely that they would purposely make or sell beverages that could harm potential repeat customers.

Health outcomes

There is a widespread perception that informal, noncommercial alcohol carries with it higher risks for negative health outcomes than do commercially produced beverages. This view is often derived from stories in the media about large-scale poisonings and harm. However, prior reports from chemical analyses of beverage samples from the informal sector in a number of countries suggest that while bad batches do exist and overall quality may be lower, there is no conclusive scientific evidence that noncommercial alcohol is more toxic than commercial beverages (Lachenmeier & Rehm, 2009; Haworth & Simpson, 2004). The exception to this is surrogate alcohol, which is not intended for human consumption and often contains toxic compounds. The chemical analyses undertaken for this project in five countries support this conclusion. The analyses generally demonstrated that most of the products were safe, with a few exceptions. Some samples from Russia, for example, contained excessive levels of acetaldehyde, while in Kenya some showed traces of lead and elevated copper levels. Some of the samples analyzed in Brazil showed the presence of microbes and other biologically active ingredients.

It appears that the main drivers for health outcomes are the pattern of consumption and the general health status of the consumer. We have mentioned that noncommercial alcohol beverages are generally

consumed by those at the bottom of the socioeconomic scale because of price and availability. According to several country reports, many of these consumers also demonstrated symptoms of alcohol dependence. In Sri Lanka, where the illicit distilled beverage *kasippu* is popular, 70% of consumers reported they sometimes or often drink alone, typically at the point of sale. In India, the study identified high rates—over 80% in some sites—of problem drinking among participants, as identified by the CAGE questionnaire. In the Belarus study, over half of the 51 alcohol-dependent men interviewed consumed the homemade vodka *samogon*. Similar rates were reported in Russia, where about half of high-risk consumers drank *samogon* and alcohol surrogates in addition to commercial alcohol. In Botswana, it was suggested that more than half of noncommercial alcohol consumers drank regularly, and daily if possible. More than half of these respondents reported that their most recent drinking episode lasted four hours or longer.

Policy considerations

Alcohol policies that address the informal market vary among the nine countries studied, and the challenges to implementing them are formidable. In countries such as China, Botswana, and Kenya, traditional noncommercial beverages are legal within certain contexts and their production and sale may be regulated to some degree by local authorities. Russia and Belarus have national regulations governing the sale and production of noncommercial alcohol. The case of Belarus suggests that with proper enforcement, reductions in consumption of noncommercial alcohol can be achieved. It is unclear whether such regulations also have an impact on problematic consumption patterns. In other countries, regulations may be on the books but enforcement is either weak or obstructed by corruption, as is noted in the country study on Mexico.

In the Sri Lanka report the investigators point to a series of steps that could stem the consumption of *kasippu,* including tightening and enforcing legislation, providing better employment opportunities, changing people's attitudes toward noncommercial alcohol products, conducting workshops with community leaders on the local alcohol situation, and lowering the price of commercial alcohol so that it would become a viable option for lower-income consumers.

Finding ways of integrating at least some parts of noncommercial production into the formal sector is another policy option. In the study from Brazil, for example, key informants noted that there is no incentive for small producers to cooperate with the formal sector for the production and sale of cachaça. The report recommended that public health authorities determine new strategies, such as tax incentives, to encourage producers to register their activities formally. The investigators note that this could lead to improvements in both employment conditions and beverage quality.

Conclusion

While the studies undertaken under Global Actions are limited in scope and much work remains to be done in filling the gaps around noncommercial alcohol, the methodology employed seems to have been a useful way forward in capturing at least a part of the noncommercial alcohol market in each of the nine countries. Most authors noted the need for further research in order to better understand the dynamics of the informal market and thereby address policy and public health implications.

References

Adelekan, M., Razvodovsky, Y. E., & Liyanage, U. (2008). *Noncommercial alcohol in three regions* (ICAP Reviews 3). Washington, DC: International Center for Alcohol Policies.

Haworth, A., & Simpson, R. (Eds.). (2004). *Moonshine markets: Issues in unrecorded alcohol beverage production and consumption*. New York: Brunner-Routledge.

Lachenmeier, D. W., & Rehm, J. (2009). Unrecorded alcohol: A threat to public health? *Addiction*, *104*(6), 875–877.

Lachenmeier, D. W., Schoeberl, K., Kanteres, F., Kuballa, T., Sohnius, E. M., Rehm, J., et al. (2011). Is contaminated unrecorded alcohol a health problem in the European Union? A review of existing and methodological outline for future studies. *Addiction*, *106* (Suppl. 1), 20–30.

Macdonald, S., Wells, S., & Giesbrecht, N. (1999). Unrecorded alcohol consumption in Ontario, Canada: Estimation procedures and research implications. *Drug and Alcohol Review*, *18*, 21–29.

McKee, M., Adany, R., & Leon, D. A. (2012). Illegally produced alcohol. *BMJ*, *344*, e1146.

World Health Organization (WHO). (2004). *Global status report on alcohol 2004*. Geneva: Author.

World Health Organization (WHO). (2011). *Global status report on alcohol and health*. Geneva: Author.

Belarus

Summary of research from the Grodno region

Yury E. Razvodovsky
Grodno State Medical University[1]

Context

Despite some reduction in the level of alcohol-related problems observed in the past few years, the alcohol situation in Belarus remains complex. According to experts' estimates 20% of all deaths (22.6% of deaths among men and 14.3% of deaths among women) and 29.7% of deaths among those of working age are from causes indirectly related to alcohol. Over the past decades, mortality from all causes, as well as alcohol-related mortality, has fluctuated significantly. Mortality declined sharply during the anti-alcohol campaign of 1985–1988, then rose abruptly during the 1990s, stemming mainly from cardiovascular, external, and alcohol-related causes. The results of ARIMA time series analysis indicate that alcohol consumption is significantly associated with mortality rates. An increase of 1 liter per capita in the level of alcohol sales is accompanied by increases in the mortality level for deaths associated with the following causes: cardiovascular (3.1%), external (5.5%), trauma and accidents (6.2%), murders (4.8%), suicides (2.6%), acute alcohol poisoning (11.1%), cirrhosis of the liver (6.1%), pancreatitis (6.2%), and alcoholism and alcohol psychoses (18%). The level of mortality from various causes is more closely associated with per capita sales of vodka than with the total level of alcohol sales.

A screening study performed among residents of the city of Grodno indicates that alcohol is consumed two times or more per week by 21.8% of men and 3.8% of women, and that 3.5% of men and 1.3% of women consume alcohol daily. More than five standard doses per day are consumed by 64% of men and 18% of women, while 20% of men and 2.1% of women drink more than 10 standard doses daily (more than 300 ml of vodka). Of particular concern is that a significant part of the population consumes alcohol in doses exceeding the threshold level, which is associated with a high risk for the development of alcohol-related problems. Moreover, the results of screening indicate that approximately 30% of men and 4% of women already have signs of alcohol dependence.

The consumption of undocumented alcohol in Belarus is a serious medical and social problem. It is estimated that undocumented alcohol accounts for up to 50% of the level of official sales. The main source of undocumented alcohol is *samogon* (homemade vodka). *Samogon* is produced both in homes and in remotely located mini-factories that sell to others. Another important source of undocumented alcohol is the unrecorded production by licensed companies. Many households also make homemade wine by fermenting the juice of various fruits and berries. However, this type of noncommercial alcohol does not make up a significant share in the structure of undocumented alcohol consumption.

***Samogon* is produced both in homes and in remotely located mini-factories that sell to others. The quality of this homemade vodka differs depending on whether it is manufactured for one's own use or for sale.**

1 Author affiliation included for purposes of information only.

Alcohol policy in Belarus

In Belarus, a great deal of attention is paid at the state level to prevention of alcohol-related problems. At the end of the 1990s, multiple measures were adopted to strengthen government control of the alcohol market. In particular, 1998's Law No. 193-3, *On State Regulation of the Production and Sale of Alcohol Products,* defined the procedure for licensing the production, wholesale and retail trade, and import and export of alcohol. It also stipulated the establishment of quotas for the production, export, and import of alcohol products, as well as state regulation of alcohol prices.

Several other pieces of legislation were adopted to regulate the alcohol market, including labeling policies, authenticity controls, and licensing stipulations. In addition to these legislative acts, the Council of Ministers adopted two state programs to reduce alcohol beverage consumption by the republic's population, thereby reducing the incidence of alcoholism and the levels of disability and mortality related to alcohol abuse.

The main legal act regulating the sale of noncommercial alcohol in Belarus is the Administrative Code, which prohibits importing, transporting, or storing more than 10 liters of alcohol beverages not labeled with the required excise stamps, or more than 30 liters of alcohol beverages without documents confirming their legality—with the exception of those manufactured by individuals solely for their own consumption. It also prohibits the production, processing, storage, transporting, or sale of more than 5 liters of ethyl alcohol, regardless of volume. In addition, the sale of alcohol beverages by individuals, including those they produce, involves a fine and confiscation of the beverages sold. The Administrative Code also prohibits the manufacture or acquisition by individuals of hard liquor (*samogon*) and homebrew (*braga*), as well as the storage of equipment for their manufacture.

Main types of noncommercial alcohol in Belarus

Noncommercial alcohol in Belarus includes *samogon*, counterfeit vodka, industrial alcohol, alcohol-containing medicinal preparations, and cologne.

Samogon is a hard liquor that is produced in homemade stills through fermentation of grain, sugar, and other products. Not only is it difficult to produce distilled alcohol beverages at home that are high quality and safe for health without the use of complex and costly industrial equipment, but the quality of *samogon* differs depending on whether it is manufactured for one's own use or for sale. In the manufacture of *samogon* intended for sale, various substances are often used that increase the effects of ethanol (e.g., tobacco leaf, asbestos sheeting, chicken manure, car tires).

The most widespread production of *samogon* occurred in the 1990s when the government in essence lost control of the alcohol market. During this time, stills for production of unregistered alcohol could be freely obtained and used without any consequences. However, in recent years the media have frequently reported seizures of *samogon* and *samogon* equipment from residents in rural areas, where *samogon* production is more common. According to the Ministry of Internal Affairs, during 2006 the police seized 20,931 liters of *samogon*, 304,499 liters of homebrew, and 41,828 liters of alcohol-containing liquid in the Grodno region. In 2009, the police seized 6,396 liters of *samogon*, 165,679 liters of homebrew, and 19,963 liters of alcohol-containing liquid.

The nature of *samogon* distilling in Belarus has become substantially different in recent years compared to the 1980s. Previously, a large portion of *samogon* was produced at home for one's own needs; in recent years its main source has been mini-factories situated in hard-to-reach places, such as wooded areas. In 2009, 1.8 million liters of alcohol-containing liquid were seized in Belarus from illegal sales, and over 2,000 mini-factories producing *samogon* were shut down.

Counterfeit vodka is produced by diluting food-grade and industrial alcohol, in large part imported from Russia. The main sources of industrial alcohol are the so-called dual-use alcohol-containing liquids (household chemicals, disinfectants, window washing solvents) with 70–96% ethyl alcohol content by volume. After neutralizing chemical additives by a makeshift method, industrial alcohol is diluted with water, bottled, and then sold. The price of

A mini-factory with *samogon* stills.

surrogate alcohol is one and one half times cheaper than state vodka, accounting for its popularity among individuals who abuse alcohol. Some counterfeit vodka is sold on the underground market, with the remainder sold in state stores and even restaurants.

Alcohol-containing medicinal preparations, most often used as nonpotable alcohol, include tincture of hawthorn and tincture of motherwort. These preparations can be obtained without a prescription at practically any drugstore and contain at least 65% alcohol by volume. Tincture of hawthorn is sold in 100 ml bottles for 2,040 rubles (about USD $0.67), in 50 ml bottles for 1,400 rubles (about $0.47), and in 25 ml bottles for 1,290 rubles (about $0.43). Tincture of motherwort is sold in 50 ml bottles for 1,390 rubles (about $0.47).

Currently, cologne is rarely used as a source of drinking alcohol, but it can be obtained at all city kiosks. An 85 ml bottle of cologne with 50–60% alcohol by volume costs 2,600 rubles (about $0.87). This is approximately what 0.5 liters of fruit wine cost. Therefore, the majority of consumers of noncommercial alcohol prefer wine. Nevertheless, cologne use still takes place among "heavy" drinkers.

Description of the study

The goal of this pilot study was to analyze the status of noncommercial alcohol in the Grodno region. A semi-structured interview consisting of more than 30 questions was conducted with participants from the following groups: homeless individuals (23), patients under treatment in the Substance Abuse Department of the Grodno Regional Psychiatric Clinic (51), and urban (187) and rural (50) residents among the general population. The questions concerned the type of alcohol beverage consumed, the method of consuming alcohol and its surrogates, and health problems arising from the consumption of alcohol, with emphasis on the consumption of noncommercial alcohol.

Findings

Of the 23 homeless individuals interviewed, more than half periodically consume *samogon*, which they obtain from acquaintances. Almost all periodically use tincture of hawthorn and tincture of motherwort, which they buy at drugstores and usually ingest on an empty stomach. Medical preparations containing alcohol are used because they are regarded as a "pure medicinal product." Until recently, the majority of homeless respondents regularly used industrial alcohol, obtained at underground sales outlets. Most of these respondents experienced

health problems after using industrial alcohol, including malaise, severe hangover, and loss of vision. All homeless respondents have acquaintances who have died from industrial alcohol poisoning, which has made many of them afraid to use it.

The 51 alcohol-dependent men interviewed have been under treatment in the Substance Abuse Department of the Grodno Regional Psychiatric Clinic. *Samogon* is consumed by 51% of these patients, and approximately 10% use surrogates (medicinal preparations containing alcohol and industrial alcohol). The conviction that *samogon* is a chemically purer product than state vodka is the main motive for its consumption, although about 30% of patients experienced symptoms of poisoning after consuming it. The inexpensive price of *samogon* is the second most important motive for its consumption, no doubt because of the low income level of a significant number of patients. Approximately half of the patients buy counterfeit vodka on the underground market, and more than 70% of those who bought counterfeit vodka in a store noticed symptoms of poisoning after consuming it. Thus, the sale of counterfeits through the official trade network discredits the quality of licensed alcohol and reinforces the conviction of consumers that *samogon* is a chemically purer product than state vodka.

Interviews also were conducted with 32 men and 18 women who live in rural areas. The average alcohol consumption per year (in terms of absolute alcohol) was 26.5 liters for men and 6.8 liters for women. The high level of alcohol-related problems among men is associated with the high prevalence of *samogon*, which is consumed by 60% of men and 20.1% of women, with 13.4% of men consuming it two to three times a week. The affordability of *samogon* is the main reason for its popularity since about half of rural men report having a low income level. One fifth of the men consume in excess of one bottle of vodka during a binge, which significantly increases the risk of acute alcohol-related problems. More than 60% of rural men and about one third of the women have signs of alcohol dependence (withdrawal syndrome). Surrogates are used by 11.1% of men and 6.6% of women, with 7.4% of men using them two to three times a week. Because of the scarcity of legal vodka, more than one third of rural men and women had to buy counterfeit vodka in a store.

Approximately half of the 113 men and one tenth of the 74 women interviewed who live in the city of Grodno acknowledged the occurrence of withdrawal symptoms. The majority of urban men prefer hard liquor, while women mainly consume dry wine. More than a third of men consume *samogon*. In contrast to rural men, the majority of urban men are guided in their selection of an alcohol beverage by the criterion of quality, perhaps explained by their higher income level. Surrogates are used by 10.7% of men and 1.6% of women, and 1.8% of

Alcohol-containing medicinal preparations.

men use them daily. More than 40% of urban men and one fourth of urban women bought counterfeit vodka in a store, which indicates the relevance of the problem of noncommercial alcohol. The average alcohol consumption per year was 10.3 liters for men and 3 liters for women.

Indirect estimation of consumption of noncommercial alcohol in Belarus

Using the incidence of alcoholic psychoses, the level of undocumented alcohol consumption was assessed in Belarus from 1980 to 2009. This consumption varied significantly: it declined sharply in the mid-'80s, then increased sharply in the second half of the '80s and the first half of the '90s, after which it gradually began to decline. In the second half of the '90s, the level of undocumented alcohol consumption was comparable to the level of documented beverage sales, amounting to 50–55% of total alcohol consumption. After reaching its peak in 1997, the level of undocumented alcohol consumption declined gradually, which was associated with the increase in state control over the alcohol market. From 2005 to 2008, the level of undocumented alcohol consumption decreased by 2.4 times (from 7.0 to 2.9 liters). Obviously, the cause for this sharp decline was an increase in measures to combat *samogon* production and the illegal sale of other alcohol-containing liquids. According to estimates, in 2009 the level of undocumented alcohol consumption was 3.4 liters per person (28.3% of official sales or 22.1% of total consumption).

The data obtained from interviews and indirect estimation indicates that noncommercial alcohol continues to account for a significant portion of total alcohol consumption in Belarus. The main types of noncommercial alcohol used are *samogon*, counterfeit vodka, and medicinal preparations that contain alcohol and industrial alcohol. Noncommercial alcohol is most popular among the homeless, patients of substance abuse clinics, and rural residents. Its affordability is the main reason for its popularity. The prevalence of the consumption of *samogon* is explained to a large degree by the conviction of people that it is a higher-quality product than state vodka. The illegal sale of counterfeit vodka through the state trade network helps to strengthen this conviction. The experience of Belarus with alcohol policy indicates that a decrease in state control over the alcohol market is accompanied by an increase in the level of noncommercial alcohol consumption, and vice versa: tightening control leads to a reduction in its consumption.

Additional reading

Razvodovsky, Y. E. (2008). *Индикаторы алкогольных проблем в Беларуси* [*Indicators of alcohol problems in Belarus*]. Grodno: Medical University Press.

Razvodovsky, Y. E. (2008). Noncommercial alcohol in Central and Eastern Europe. In M. Adelekan, Y. E. Razvodovsky, & U. Liyanage (Eds.), *Noncommercial alcohol in three regions* (ICAP Reviews 3, pp. 17–23). Washington, DC: International Center for Alcohol Policies.

Razvodovsky, Y. E. (2009). Финансовая доступность алкоголя и уровень его продажи в Беларуси [The affordability and sale of alcohol in Belarus]. *Вопросы организации и информатизации здравоохранения*, (4), 63–69.

Razvodovsky, Y. E. (2010). Unrecorded alcohol consumption: Quantitative methods of estimation. *Alcoholism*, *46*(1), 15–24.

Razvodovsky, Y. E. (2011, April). Потребление суррогатов алкоголя городским населением [Consumption of alcohol surrogates by urban population]. Proceedings of the international conference *Medico-social ecology of personality: Current state of art and perspectives*, Minsk, Belarus.

Razvodovsky, Y. E. (2011). Consumption of noncommercial alcohol among alcohol abuse clinic patients. *Alcoholism*, *47*(1), 3-10.

Razvodovsky, Y. E. (2011). Алкогольная политика в Республике Беларусь на современном этапе [Current alcohol policy in the Republic of Belarus]. *Вопросы организации и информатизации здравоохранения*, (3), 38–45. Available in English in *ICAP Periodic Review on Drinking and Culture*, *7*, 3–9. http://www.icap.org/LinkClick.aspx?fileticket=5RJaM6RQgqs%3d&tabid=77

Razvodovsky, Y. E. (2012). Экономическая доступность и обьемы реализации алкоголя в Республике Беларуси [Alcohol affordability and consumption levels in the Republic of Belarus]. *Вопросы наркологии*, (1), 30–40. Abstract available in English in *ICAP Periodic Review on Drinking and Culture*, *7*, 20.

Razvodovsky, Y. E. (2012). *Некоммерческий алкоголь в Беларуси: медицинские и социальные аспекты* [*Noncommercial alcohol in Belarus: medical and social aspects*]. Saarbrucken: Lambert Academic Publishing (LAP).

Razvodovsky, Y. E., & Dukorsky, V. V. (2012, April). Медико-социальные корреляты потребления суррогатов алкоголя [Medico-social correlates of consumption alcohol surrogates]. Proceedings of the international conference *Medico-social ecology of personality: Current state of art and perspectives*, Minsk, Belarus.

Botswana

Summary of nationwide research

Alexander von Rudloff
Emang Professional Services[1]

Lucky Mogkatlhe and Godisang Mookodi
University of Botswana

Context

Botswana, a middle-income country, has for many years had the fastest growing economy in Africa because of the presence of some of the world's most productive diamond mines. Fiscal management has generally been good and the country enjoys a relatively high level of infrastructural development and services, though many Batswana still live in poverty.

Botswana's commercial alcohol industry is well established, with local clear beer production reported at some 600,000 hectoliters per year, and local and imported beverages accounting for a vibrant alcohol trade. Some 130,000 hectoliters of traditional-style sorghum/maize opaque beer are produced annually and sold commercially under the name Chibuku. The World Health Organization's *Global Status Report on Alcohol 2011* estimated that total alcohol consumption in Botswana among those 15 years and over was 7.96 liters pure alcohol per capita per year, including 3 liters from unrecorded sources.

The principal locally made noncommercial products in Botswana are home-brewed opaque beers, such as the sorghum- or millet-based *bojalwa jwa Setswana.* Other noncommercial beverages include *khadi* (a wine produced from berries, fruits, roots, and/or honey) and various home-brewed or home-distilled beverages made from grains, fruits, berries, honey, roots, palm sap, and other ingredients. The production and consumption of traditional sorghum- or millet-based beer is integral to many Tswana celebrations and rituals and is central to weddings, harvest festivals, and events in honor of ancestors, and *bojalwa jwa Setswana* is regarded with deep affection by many Batswana.

In some settings, both urban and rural, a significant number of women, and a small number of men, engage in the production and sale of noncommercial alcohol beverages as their main business activity and as a means of supporting their families. Homesteads where noncommercial alcohol is produced and sold are known as shebeens or informal taverns.

Recently, various additives such as tobacco, cannabis, battery acid, and methyl alcohol have been found in some of the brews, particularly those favored by remote area

Many shebeens are expected to close since new regulations came into effect in 2012.

Seretse root used for *khadi*.

1 Author affiliation included for purposes of information only.

dwellers that include the San, or Bushmen, with occasional reports of poisoning that have sometimes resulted in death. *Khadi,* though widely consumed and usually benign in nature since it is a naturally fermented wine, has earned a mixed reputation, largely due to a variety of toxic additives employed by a minority of producers.

New regulations to affect the noncommercial alcohol landscape

Regulations affecting the production and sale of noncommercial alcohol were implemented in December 2011, and regulations prohibiting the sale of Chibuku from residential premises were implemented in July 2012 (after the study discussed below had concluded). Although Chibuku is a commercial beverage, it has traditionally been sold in the same settings as noncommercial alcohol. Before the 2012 regulations came into effect, some 80% to 85% of the output of Botswana Breweries Limited (BBL), the producer of Chibuku, was sold in informal taverns and shebeens operating from residential premises, which were exempted from licensing provisions of the 2004 Liquor Act.

The withdrawal of this exemption will undoubtedly have a major impact on BBL, as well as on shebeen operators. The presumption is that many shebeens will close, while others are likely to increase noncommercial alcohol production to fill the market gap created by the removal of Chibuku from its traditional setting. Chibuku will still be available, but only through licensed premises that are far less prevalent than shebeens, and it is likely that many Chibuku drinkers may be driven to noncommercial alcohol. Those who rely on the shebeen trade for their livelihood will consequently face a number of challenges. Many shebeens operate in households headed by a single female whose only source of income is from the informal alcohol trade. There have been efforts in the national parliament to suspend the new regulations on the grounds that the laws discriminate against Chibuku and are impoverishing people who depend on its sale to earn a living.

It is also widely anticipated that the latest moves to curb alcohol consumption will drive the noncommercial alcohol trade underground and introduce a criminal element into the industry. The production

Sorghum mash after cooking for traditional beer production.

and sale of *sekhokho* (a sorghum-based spirit also known as Bobirwa gin), which is banned in most of the country, appears to have already been driven underground.

Another significant government initiative to curb alcohol consumption is the 40% levy on commercial beverages that became effective in December 2010. The government's stated intention is to use levy revenues to support social programs. The Levy on Alcoholic Beverages Fund is earmarked to promote projects and activities designed to combat and minimize the effects of alcohol misuse. These measures include conducting education campaigns for the public and for schools, advocating alcohol-free youth activities, supporting rehabilitation of alcohol-dependent persons, monitoring and limiting alcohol advertising in sports activities, and taking measures to curb drink driving. Although the government has increased educational and awareness programs about the risks of alcohol consumption, it remains to be seen how effectively the revenues from the fund will be employed to implement its stated aims.

Under the new regulations the types of noncommercial alcohol that may legally be produced and sold, and the hours of sales, are determined by local chiefs and often differ from one locality to the next. Many shebeens already adhere to local regulations and sell only during permitted trading hours, although many others continue to sell noncommercial alcohol outside of the prescribed hours of operation.

The press has reported arrests of unlicensed Chibuku retailers less than two weeks after the laws came into effect. However, it is not yet evident how effective or vigorous the enforcement of the new regulations will be over time, given the logistical challenges associated with enforcing the regulations across such a large and sparsely populated country.

Study methodology

Information on the production, quality, sale, and consumption, and effects of noncommercial alcohol has long been inadequate because the beverages are largely outside government control. To gain a better picture of the noncommercial alcohol situation in the country, we conducted a national study of production and consumption in 10 urban and 10 rural locations throughout Botswana in early 2012, using qualitative and quantitative components.

- Qualitative research sought to obtain a comprehensive overview of the noncommercial alcohol situation in each study site. Information was gathered on general drinking patterns and related outcomes, the characteristics of producers and consumers, the public perception of various beverages and their consumers, and the harms and benefits associated with the noncommercial alcohol market. The qualitative component began with a desk-based review of contextual issues, including collecting general background information, conducting key informant interviews, and reviewing and updating contextual issues to augment the findings of a 2010 pilot study.[2] This was followed by a rapid situation assessment involving 43 key informant interviews (conducted with community leaders, tribal authorities, law enforcement officials, and health and social welfare personnel) and 15 focus group discussions (conducted with 135 respondents including community members as well as noncommercial alcohol producers and vendors).
- The quantitative component concentrated on individual drinking habits and sought to ascertain the types and volumes ingested as well as the personal, domestic, social, and health consequences of consuming these products. This component involved 1,171 structured questionnaire-based interviews of noncommercial alcohol consumers, all of whom were at least 18 years of age and were patrons of shebeens or other sites where noncommercial alcohol is sold. The sample was nearly equally split between urban and rural sites. Consumers 35 years of age or older made up 58% of those surveyed, and men accounted for 75% of the sample. Data analysis was conducted by a statistician using SPSS software.

2 Findings from the pilot study, conducted in Mogobane and in the Nkoyaphire district of Gabarone, can be found at http://www.global-actions.org/LinkClick.aspx?fileticket=Rs%2fCEGrNEN8%3d&tabid=525

A still for producing *sekhokho*, or Bobirwa gin.

An urban shebeen in the Francistown area.

Findings

The qualitative and quantitative research revealed some general trends with regard to perceptions of beverages and consumers, consumption patterns of noncommercial alcohol, and related social and individual outcomes.

Beverage preferences

According to the focus groups and key informant interviews, although both *khadi* and *bojalwa jwa Setswana* were seen by study participants as "traditional," "wholesome," and "socially acceptable" drinks, *bojalwa jwa Setswana* clearly was regarded as the primary traditional drink and enjoyed wider public acceptance, especially as an essential ingredient of traditional feasts. This belief was backed by the questionnaire results, which indicated that *bojalwa jwa Setswana* was consumed by 82% of study participants at least once in the previous four weeks. A distinct perceptual divide was observed between traditional brews that were regarded as "wholesome" and "part of our culture," such as *bojalwa jwa Setswana* and *khadi*, and those regarded as potentially dangerous and less socially acceptable, including *sekhokho* and various adulterated brews that have appeared on the market only recently.

It was apparent that economic factors were central to the choice of beverage, with consumers often buying traditional brews as a last resort when they cannot afford other drinks. Certain status was attached to persons who drank only commercial alcohol drinks. Some older consumers, however, expressed a preference for traditional beer, which they believe to be more nutritious. Moreover, a number of respondents cited the cultural role of traditional beer as a reason that most people enjoy it, even if they express a preference for commercial drinks.

Consumption trends

Of all consumers surveyed, 92% reported drinking noncommercial beverages in the previous month, 82% in the previous seven days, and 61% on the previous day. This suggests that more than half of all consumers of noncommercial alcohol drank regularly, and daily if possible. More than half of all respondents reported that their most recent drinking episode lasted four hours or longer.

The data indicate that a large number of consumers drink without any self-control when alcohol is available. Some drink at every available opportunity and continue drinking until they lose consciousness or run out of cash, credit, or the brew.

The volume of noncommercial alcohol consumed during a typical drinking occasion was difficult to gauge. Noncommercial alcohol is typically shared among consumers by passing around a container, making individual measurement impossible, and the alcohol by volume varies among beverage types and individual brews. Based on the

average strength of each type of beverage and consumers' estimates of their own consumption, it was calculated that the 1,069 consumers who drank noncommercial alcohol in the four weeks prior to being surveyed reported drinking an average of 167 ml of pure alcohol in their last drinking occasion, of which 104 ml came from commercial beverages and 63 ml came from noncommercial beverages. These figures are higher than expected and must be considered in light of the methodological limitations noted above. It is also suspected that some consumers exaggerated their consumption, particularly of commercial beverages, to impress the interviewers and any fellow drinkers who may have been near enough to overhear their claims.

Noncommercial beverages are less expensive than commercial products and are generally associated with consumers of low socioeconomic status. More than half of the consumers surveyed reported earning less than BWP 300 pula (USD $40) per month. Most of these consumers prefer to socialize with peers of similarly low socioeconomic status, probably feeling out of place at bars frequented by working people with greater disposable income and more sophisticated tastes. It would appear that many regard the shebeen as a preferred setting for alcohol consumption and social interaction, with a perception of superior coziness at shebeens in comparison to Chibuku depots and bars, both of which are also perceived to be more dangerous than shebeens.

Mayonnaise jars used for selling *khadi*.

On the other hand, 76% of participants reported consuming commercial alcohol as well as noncommercial alcohol within the last four weeks. The most widely consumed commercial beverage is Chibuku, which was consumed in the last four weeks by 91% of those surveyed. Respondents aged 18 to 25 reported consuming the most commercial alcohol and the least noncommercial alcohol per capita, while respondents aged 26 to 45 consumed the most noncommercial alcohol per capita. Some consumers frequent bars and consume commercial drinks at the beginning of the month and then migrate to shebeens for cheaper, noncommercial alternatives as cash resources dwindle.

The amount of money spent on noncommercial alcohol correlated with the income level of the consumer, with some low-income individuals reporting no expenditure at all and therefore relying on the generosity of others. The highest spenders were those 18 to 25 years old, who reported spending an average of 67 pula ($8.75) per drinking occasion, followed by those 26 to 35 years old, who spent 38 pula ($4.96). Respondents 56 years of age or older spent 19 pula ($2.48) per drinking occasion—less than a third of what the youngest adults paid. One in four respondents with no income reported consuming more than 30 pula ($3.92) worth of alcohol the last time they drank, which suggests that some of these consumers may be given noncommercial alcohol in lieu of payment for odd jobs rendered.

Health and social consequences

Thirty-four percent of questionnaire respondents admitted that drinking has led them to engage in risky sexual activities. Within this group, 31% indicated that drinking may lead to transactional sex, 28% indicated that it reduces responsibility, and 18% believed that it enhances the libido.

Among all questionnaire respondents, 31% felt that alcohol was detrimental to their health. Study participants cited an array of health problems associated with consuming alcohol, including general health deterioration (reported by 57% of those who acknowledged health consequences), mental problems (10%), headache (7%), nonadherence to HIV treatment regimens (5%), and erectile dysfunction (4%). Consumers from the two highest income brackets were

more likely to report that alcohol has been detrimental to their health and has contributed to casual sexual relationships.

Asocial and disruptive behavior was generally associated with commercial beverages and bars, and less so with shebeens. Chibuku was seen as having the worst social impact, while *bojalwa jwa Setswana* and *khadi* were not generally regarded as contributing to negative outcomes.

Unlike in licensed bars, children are often present in shebeens, where they are consequently at risk of a number of potentially harmful health and social outcomes. Children of shebeen operators, children of neighbors, and those sent to the shebeens on errands may be vulnerable because their parents are heavy drinkers or are preoccupied with running the shebeen. Problems facing these children may include interference with their education, lack of sleep, exposure to inappropriate behavior, psychic trauma from witnessing disputes and violent conduct, and vulnerability to sexual abuse. Children associated with shebeens are also likely to begin drinking at an early age because of the constant availability of alcohol and poor supervision. It is notable that there appear to be many apologists for this interaction between children and noncommercial alcohol, including some who feel that the hardships these children can experience are merely part of growing up.

Conclusion

Noncommercial alcohol is deeply rooted in the culture and lifestyle of many Batswana. Production, sale and consumption of noncommercial beverages are widely accepted as features of normal life. Strong feelings about alcohol in general and noncommercial beverages in particular are also prevalent, with abolitionists, moderates, and supporters across all segments of society engaged in vigorous debate about the way to reduce alcohol-related harm. Although noncommercial alcohol is chiefly associated with those at the bottom of the socioeconomic ladder, who appear to constitute the majority of noncommercial alcohol consumers, the phenomenon is not confined to this demographic.

The situation facing both the formal and informal segments of the alcohol industry in Botswana is extremely dynamic, with a series of recent changes affecting pricing and availability of beverage alcohol occurring within a short period of time. It is unclear, however, how strictly the new laws will be enforced, how effective they will be at reducing alcohol-related harm, and what effects they may have on shebeen operators and other individuals involved in the noncommercial alcohol trade. Future research will need to examine such questions in detail.

Brazil

Study of research from the states of São Paulo and Minas Gerais

Elisaldo Carlini, Julino A. R. Soares Neto, and Giuseppina Negri
Centro Brasileiro de Informações sobre Drogas Psicotrópicas (CEBRID)[1]

Context

Public health problems resulting from the improper consumption of alcohol beverages are a serious cause for concern in many countries, and Brazil is no exception. Epidemiological surveys conducted in Brazil in the last decade show that 10% to 15% of all persons aged 12 to 65 meet criteria for alcohol dependence, with the proportion of men 3 to 4 times greater than that of women (Carlini et al., 2006, 2010; Galduróz & Caetano, 2004; Laranjeira, Pinsky, Zaleski, & Caetano, 2007). According to Nappo and Galduróz (1996), examinations at the Legal Medical Institutes of various Brazilian cities revealed the presence of alcohol in the blood of 15.2% of people who died from nonnatural causes such as traffic crashes and firearms. From 2006 to 2010, 34,573 deaths in Brazil were caused by the consumption of alcohol beverages, representing 84.9% of all deaths caused by licit or illicit psychoactive substances (Confederação Nacional de Municípios [CNM], 2012). According to this study, the state with the highest rate of alcohol-related deaths in this period was Minas Gerais, with 0.082 deaths for every 1,000 inhabitants.

Commercial beverages, especially beer, account for most of the alcohol beverages consumed in Brazil. However, the formal beverage alcohol market coexists with an increasingly important noncommercial market. According to a study conducted from 1993 to 1999 on the authenticity of commercially sold beverages in Brazil, 391 of the 608 samples sent by police for analysis were counterfeit—with whiskeys accounting for 70% of counterfeits—and two samples exhibited methanol content above the legal limit (Nagato, Duran, Caruso, Barsotti, & Badolato, 2001). A study conducted by Fundação Getúlio Vargas (FGV, 2008) estimated that the proportion of all alcohol beverages consumed in Brazil that are produced informally is 20.3%, which amounts to 2.1 liters of pure alcohol per person per year.

Current data reveal that cachaça, a spirit made from sugarcane, is the distilled beverage most consumed by Brazilians (8.0 liters per person per year), and many cachaça producers have begun investing heavily in quality control and marketing to make their product more appealing to the international market. Production of cachaça in Brazil amounts to 1.5 billion liters per year (Mutton & Mutton, 2010). According to estimates by the Ministry of Agriculture, there are approximately 30,000 to 40,000 stills in Brazil, of which 95.5% are thought to be clandestine, contributing 10% to 20% of total cachaça production. These stills are characterized by small production and are dispersed throughout the country due to the ease of purchasing the raw materials, low initial investment in production, and the high taxation on registered products (Martinelli, Spers, & Costa, 2001). A study conducted by Almeida (2007) in the city of Abaíra, Bahia, showed that only 34 of 500

80.5% of consumers in the state of São Paulo reported that they have consumed noncommercial beverages, primarily cachaça and homemade beverages.

1 Author affiliation included for purposes of information only.

Cláudia M. A. Carlini, Ricardo Tabach, and Mônica Gorgulho are also acknowledged as collaborators.

stills in the city were regulated, meaning that 93.2% were clandestine.

Although the informal alcohol market is significant in Brazil, there has thus far been only limited research on the subject, especially on related aspects such as counterfeiting, tax evasion, and methanol poisoning. Greater research on the health, social, and economic impacts of noncommercial beverages in the country is needed.

Description of the study

Our research on unregistered alcohol beverages was divided into two stages: a study in two municipalities of the state of São Paulo (SP) in 2010,[2] followed by a study in the state of Minas Gerais (MG) in 2011 and 2012. These studies utilized methods and techniques that included semi-structured interviews with consumers and producers, chemical analysis of alcohol beverages, and requests for institutional data.

In the state of São Paulo, interviews were conducted in the municipalities of São Paulo and Diadema. Research in the state of Minas Gerais took place in five municipalities, all of which were known to produce cachaça. In Minas Gerais, 41.5% of interviews took place during festivals such as Micareta, Carnaval, Rodeio, and Festa da Cachaça, and the responses obtained during festivals were collected for comparison with responses gathered in the same municipalities outside of festival periods, since during the festivals the municipalities undergo various changes in their routine.

In both states, the interviewees were selected at random in public places and were at least 18 years of age. All interviews were conducted using questionnaires, with specific questions on unregistered beverages addressed only to participants who stated during the interview that they have consumed these beverages or were familiar with them.

For easier comprehension on the part of the questionnaire respondents, unregistered beverages were broken down into three categories.

- **Homemade beverages** are generally made by family recipe from a mixture of fruit, spirits (usually cachaça), and sugar and produced for one's own consumption or to be sold on a small scale. Serving homemade beverages is commonly associated with hospitality.
- **Cachaça from a still** (*cachaça de alambique*), considered an artisanal product and Brazil's most traditional beverage, has a high alcohol content and is produced in stills from a fermented mash of *garapa*, or sugarcane juice. It is often sold on a small and medium scale at a low price. Unregistered cachaças are popularly known as *cachaça da roça* ("country cachaça") or *cachaça de barril* ("barrel cachaça").
- **Counterfeit beverages** are mostly informally produced and sometimes adulterated beverages sold in the bottles of high-priced commercial products such as whiskey, which is why these beverages are popularly called "whiskey from Paraguay."

We also analyzed 2,808 news items, published from June 2011 to March 2012, that dealt with alcohol, drugs, or related policies in Brazil. Qualitative information gathered through this analysis helped inform our discussion and conclusions below.

Key findings

Interviews

Interviews were conducted with 430 adults in the state of São Paulo and 564 in the state of Minas Gerais. Participants in the study were mostly male, Catholic, between the ages of 18 and 30, and had a high school or university education.

A large majority of participants (60.1% in MG, 96.3% in SP) declared that they consume beverage alcohol. The beverage type most frequently consumed was beer, followed by wine. Cachaça was the third most commonly consumed beverage in MG and the fourth in SP. It was expected that the consumption of cachaça would be greater, owing to the ease of access, low price, and tradition.

2 A summary of the first stage of research, including information gathered from interviews with vendors and producers, can be found at http://www.global-actions.org/LinkClick.aspx?fileticket=sFMVZDPNOaE%3d&tabid=526

During the field observations it was noted that there were extremely few places or stalls selling cachaça at the festivals in Minas Gerais. The reason cited by one vendor is that "cachaça is very cheap and leaves the person drunk very fast, and so I don't sell much," and that "cachaça is for drinking at home, not at festivals."

Most participants (77.7% in MG, 96.5% in SP) stated that they were familiar with unregistered alcohol beverages. The unregistered beverages that respondents were most familiar with were cachaça from a still (49.7% in MG) and homemade beverages (83.5% in SP).

A surprisingly high proportion of respondents (56.6% in MG, 80.5% in SP) stated they have consumed unregistered beverages. Among this group of consumers, cachaça from a still was the most consumed type of unregistered beverage for 54.8% in MG and 34.8% in SP, while homemade beverages were the type most consumed by 24.0% in MG and 38.4% in SP. It is also interesting to note that among those participants who have consumed unregistered beverages, 19.8% in MG and 26.8% in SP stated that they know they have consumed counterfeit beverages.

The low price of unregistered beverages was a key factor in their consumption, with 40.7% of study participants in Minas Gerais and 35.7% in São Paulo indicating that price was a factor in choosing to drink unregistered alcohol. Many consumers of unregistered alcohol (37.2% in MG, 35.1% in SP) mentioned the availability of these beverages, which are found at festivals and in formal establishments such as bars, restaurants, and night clubs.

Given the high rate of consumption of unregistered beverages, it was surprising to find that a large majority of participants also stated that the effects of these beverages on health are negative, potentially causing dependence and problems to the heart, liver, or digestive tract. Participants also emphasized the social, psychological, and economic problems related to the consumption of unregistered beverages. We may suppose that this apparent paradox between health behaviors and attitudes is related to the perception of risk, which can be defined as a social construct, and is

A sample of unregistered alcohol beverages collected during the study. The label of the bottle on the right states that inverting the bottle will turn the woman into a princess ("this will happen after drinking").

therefore a domain for educational action (see De Seta, 2006). However, it should be noted that many respondents may have had trouble distinguishing between registered and unregistered beverages when discussing these matters.

Results obtained from interviews conducted in Minas Gerais during the festival period were compared with results outside the festival period. Small differences were observed in the proportion of participants who consume any beverage alcohol (63.2% during festivals and 57.9% outside the festival period) and the proportion who have consumed counterfeit beverages (24.4% during festivals and 17.3% outside the festival period). However, we believe that the data show few differences between responses collected during festival and nonfestival periods.

Chemical analysis

Of the 65 samples of noncommercial beverages collected in the municipalities of São Paulo and Diadema, 61 were obtained from consumers or vendors who were interviewed; the rest were obtained from producers. In Minas Gerais, 87 samples were collected at bars, parties, and from street vendors. The samples were chosen based on criteria that indicated informal production, such as low cost and absence of a label and sanitary seals. Most samples were of cachaça (51 samples in SP, 63 in MG); the others were all of other spirits except for one sample of wine. All samples were analyzed at the Central Analítica da Universidade de São Paulo using methodology based on AMPHORA guidelines (Lachenmeier et al., 2011).

The results obtained from analysis through gas chromatography with a flame ionization detector (GC/FID) showed that methanol was detected in 24 of 54 analyzed samples from SP and 25 of 87 analyzed samples from MG; however, in all but one sample (wine from SP), the concentration of methanol did not exceed the legal limit of 200 ppm. This same test also showed that nearly all samples contained higher-chain alcohols but in concentrations below the legal limit of 40 ppm.

The alcohol by volume (ABV) of the samples was determined through the use of infrared spectroscopy. Whereas legal cachaça typically has an ABV of 38% to 48%, only 27 of 51 tested samples in SP contained at least 38% ABV, and 12 contained less than 20% ABV. In MG, 30 of 63 cachaça samples analyzed contained less than 25% ABV.

The concentration of ethyl carbamate was qualitatively estimated using infrared spectroscopy, and in many samples there were high concentrations of substances that are indicators of ethyl carbamate. In MG, 85 of 87 samples were found to contain cyanide ions, and thus ethyl carbamate. In both states the contamination of beverages with ethyl carbamate is worrying, given the toxicity of this substance, which is tolerated by law up to only 150 ppb.

Despite legal restrictions on the use of copper in stills, 11 cachaça samples from SP and 15 samples from MG were found to contain copper above the legal limit of 5 ppm, with some samples exhibiting copper levels as high as 26 or 27 ppm.

Clipping

Of 2,704 news items on substance use collected from newspapers and magazines between June 2011 and March 2012, 24.4% contained news on alcohol beverages in general and 0.3% discussed unregistered alcohol. An additional 104 items on unregistered alcohol were collected from the Internet. Almost all electronic and print articles on unregistered beverages mentioned seizures by police or unusual content (e.g., urine in beverages or production at a funeral home).

Institutional data

Three private institutions responded to our request for data on unregistered alcohol: AmBev (Companhia de Bebidas das Américas), ABRABE (Associação Brasileira de Bebidas), and AMPAQ (Associação Mineira de Produtores de Cachaça de Qualidade).[3] Data from these institutions indicate that the problems associated with the production and sale of unregistered beverages occur in three different contexts.

3 Analysis of AmBev data was conducted by the Fundação Getúlio Vargas. Analysis of ABRABE data was conducted by the Escritório Guimarães Boanova.

- **Crimes against the economic system** involve evasion of taxes on the production, distribution, and retail sale of alcohol beverages, as well as theft of shipments. It is necessary to analyze the factors that facilitate and encourage this type of activity and to ascertain whether criminals are migrating to this activity from other, more severe types of crime.
- **Crimes against public health** chiefly involve the adulteration and counterfeiting of beverages. It is estimated that of 181 police operations conducted in Brazil between 2005 and 2010 to seize illicit beverages, 54% took place in the states of São Paulo, Minas Gerais, Rio de Janeiro, or Espírito Santo. These operations resulted in the seizure of 745,782 liters of beverages, with an annual average of 149,156 liters. According to ABRABE data, whiskeys, cachaças, tequilas, and vodkas accounted for 57% of these seizures.
- **Subsistence production** is attributed to small producers, located especially in rural areas, who lack the technical support and financial structure to afford the taxation on cachaça production and who engage in limited local commerce. Enforcement of laws against this activity is difficult. According to AMPAQ, the main cause of unregistered alcohol production in Brazil appears to be the excessive taxation on cachaça and the lack of incentives to cooperate with the formal system for the production and sale of cachaça. We recommend that public authorities determine new strategies, such as tax incentives, to include small producers in the formal production chain, which would thus improve beverage quality as well as employment conditions.

Conclusions

The overall data analysis shows the need for further interdisciplinary studies, as well as improved availability and integration of institutional data, to better understand the problem of unregistered beverages. Although many people perceive there are various health and socioeconomic disadvantages associated with unregistered beverages, consumption of these beverages is prevalent nonetheless (though it should again be noted that some study participants had difficulty distinguishing between registered and unregistered beverages). Thus, we conclude that future actions to promote public health in relation to registered and unregistered alcohol beverages should consider primarily access to information, cultural values, and income level.

Access to scientific information about unregistered alcohol can have benefits for regulatory agencies and other governmental institutions. In this context we also emphasize that journalists could report this information to the public in a more complete fashion, taking into consideration the particularities of these beverages and how such information may help promote public health.

In addition, there is a need for public policies that draw upon this integrated understanding of the social, health, and economic aspects of unregistered alcohol, in order to tackle problems related to technical assistance and law enforcement, to encourage small producers to formalize production, and to promote more interaction among all alcohol beverage sectors. While this is not an easy mission, it could be approached in part by training a specialized technical facility to deal with only the problem of unregistered beverages.

References

Almeida, R. O. (2007). A festa do "Vale Encantado"… ou o X festival da cachaça de Abaíra: Dimensões espetacular, interativa e educativa. *Candombá Revista Virtual*, *3*(1), 45–69.

Carlini, E. A., et al. (2006). *II Survey domiciliar sobre o uso de drogas psicotrópicas no Brasil: Estudo envolvendo as 108 maiores cidades do país-2005*. São Paulo: Centro Brasileiro de Informação sobre Drogas Psicotrópicas (CEBRID) and Universidade Federal de São Paulo (UNIFESP).

Carlini, E. A., et al. (2010). *VI Levantamento nacional sobre o consumo de drogas psicotrópicas entre estudantes do ensino fundamental e médio das redes pública e privada de ensino nas 27 capitais brasileiras.* São Paulo: Centro Brasileiro de Informação sobre Drogas Psicotrópicas (CEBRID) and Universidade Federal de São Paulo (UNIFESP).

Confederação Nacional de Municípios (CNM). (2012). *Mortes causadas pelo uso de substâncias psicotrópicas no Brasil*. Brasília: Author.

De Seta, M. H. (Org.). (2006). *Gestão e Vigilância Sanitária: modos atuais de pensar e fazer*. Rio de Janeiro: Editora Fiocruz.

Fundação Getúlio Vargas (FGV). (2008). *Estimativa de informalidade no segmento de bebidas alcoólicas no Brasil*. Rio de Janeiro: FGV Projetos/AMBEV.

Galduróz, J. C., & Caetano, R. (2004). Epidemiologia do uso de álcool no Brasil. *Revista Brasileira de Psiquiatria*, *26*(Suppl. 1), 3-6.

Lachenmeier, D. W., Schoeberl, K., Kanteres, F., Kuballa, T., Sohnius, E. M., Rehm, J., et al. (2011). Is contaminated unrecorded alcohol a health problem in the European Union? A review of existing and methodological outline for future studies. *Addiction*, *106*(Suppl. 1), 20–30.

Laranjeira, R., Pinsky, I., Zaleski, M., & Caetano, R. (2007). *I Levantamento nacional sobre os padrões de consumo de alcohol na popula***ção** *brasileira*. Brasília: Secretaria Nacional Antidrogas.

Martinelli, D. P., Spers, E. E., & Costa, A. F. (2001) Ypióca: Introduzindo uma bebida genuinamente brasileira no mercado global. In M. F. Neves & R. Fava Scare (Eds.), *Marketing & exportação* (pp. 272–303). São Paulo: Atlas.

Mutton, M. J. R., & Mutton, M. A. (2010). Aguardente de Cana. In W. G. Venturini Filho (Ed.), *Bebidas alcoólicas: Ciência e tecnologia* (pp. 485–524). São Paulo: Ed. Blucher.

Nagato, L. A. F., Duran, M. C., Caruso, M. S. F., Barsotti, R. C. F., & Badolato, E. S. G. (2001). Monitoramento da autenticidade de amostras de bebidas alcoólicas enviadas ao Instituto Adolfo Lutz em São Paulo. *Ciência e Tecnologia de Alimentos*, *21*(1), 39–42.

Nappo, S. A., & Galduróz, J. C. F. (1996). *Psychotropic drug-related deaths in São Paulo City, Brazil*. Paper presented at the 10th World Congress of Psychiatry, Madrid.

China

Summary of a three-year study of noncommercial alcohol production, sale, and consumption in three provinces

Ian M. Newman
Nebraska Prevention Center for Alcohol and Drug Abuse
University of Nebraska–Lincoln[1]

Ling Qian
Chinese Center for Health Education, Health News and Communication Center
China Ministry of Health

This paper summarizes the results of a three-year study of family- or village-produced alcohol in rural China. The first phase focused on describing the production methods used to manufacture distilled spirits. The second phase involved interviews with 259 village residents, including 11 alcohol makers, 9 sellers, and 21 considered village leaders. The third phase involved the chemical analysis of samples of the noncommercial alcohols sold in the villages where the interviews were conducted, in rural Hubei Province. The fourth phase involved interviews with a random sample of approximately 1,000 rural residents in each of three different provinces in China: Anhui, Hebei, and Hubei.

Context

To begin, we discuss the context of China's alcohol culture and the local environments in which noncommercial alcohols are produced.

History

Archaeological evidence suggests that alcohol has been produced and consumed in China for at least 17,000 years (Winchester, 2008, Appendix 1). First there was grain-based beer, then around 5000 BCE there was grape wine (McGovern, 2003, p. 314). The process of distillation was developed, first by freezing (300 CE) and then by heating (16th century; Temple, 1986).

No doubt throughout this time the Chinese have appreciated the many benefits of beverage alcohols and at the same time cursed some of the outcomes. Certainly the effects of the early barley beers with low alcohol by volume (ABV) differed from those of the later rice and fruit wines, and of the spirits that followed the development of distillation. Nevertheless, production and use has persisted, and alcohol in different forms has become an important part of dietary, religious, medical, social, and rite-of-passage customs. Strategies to reduce the harmful patterns of use evolved along with alcohol-making. Modern descendants of these original indigenous alcohols are still available today in China mostly in the form of fermented rice and other grains, fruit wines, and distilled spirits.

What should it be called?

The World Health Organization (1999) has estimated that 30% of the alcohol consumed in China is "unrecorded." Unrecorded alcohols included smuggled beverages, cross-border sales, and surrogate alcohol and cosmetics that are drunk. Because

In China, production is not illegal, and the product and the makers are respected members of their communities. Making, selling, buying, or drinking noncommercial alcohol are considered normal, unremarkable behaviors.

1 Author affiliation included for purposes of information only.

We acknowledge the contributions of the following people without whom this study would not have been possible: Wen Xiong, Ma Qiao Hospital in Xianning, Hubei; Guangming Mi, Department of Social Medicine and Health Education, Hebei University; Xuefeng Zhong, Health Education Institute of Anhui Province; Ping Yin, Department of Epidemiology and Statistics, School of Public Health, Huazhong University of Science and Technology, Wuhan; Yanyu Feng, China Center for Health Education; and Ganrong Xu, School of Biotechnology, Jiangnan University, Wuxi.

noncommercial alcohol in China is not illegal, it is likely that most of the unrecorded alcohol is, in fact, what we are calling "noncommercial."

Chinese traditional spirits are inaccurately referred to as "noncommercial" alcohols, a word that implies they are unrecorded, untaxed, and unregulated. In China this is only partly correct. Home-produced alcohol that is consumed only by the family members is certainly "noncommercial" in the usual sense, but such alcohol represents a very small percentage of the unrecorded alcohol drunk in China. Most of the alcohol made in small-scale distilleries is sold or traded, which makes it "commercial." It is untaxed in terms of production per liter, but in most places the maker must procure a business license and also, in most cases, a health certificate of some type. This indicates officials have ensured local standards of production are met. This type of alcohol is, therefore, regulated. This type of alcohol is "unrecorded" in terms of reporting production amounts to a central authority, but every maker we interviewed knew his production and maintained records of some type. Because this is the traditional alcohol of the community, we think it could more accurately be called "indigenous alcohol."

Alcohol culture

In China, production is not illegal, and the product and the makers are respected members of their communities. Making, selling, buying, or drinking noncommercial alcohol are considered normal, unremarkable behaviors.

In rural communities alcohol production is part of a social network that ensures the safety of the product. The maker knows his customers and they respect him for his skills. They trust him to provide an inexpensive and safe product. Alcohol makers supply sellers who have a similar relationship with their customers in these small rural communities. To the extent that the supply chain grows beyond these close interpersonal contacts, it loses the controls imposed by the social bonds. When this occurs, makers or sellers could be tempted by the prospect of more profit to modify their product. Modifications could range from adding water to increase volume, to adding chemicals and other products to increase perceived benefits.

Alcohol production can make up a significant portion of a family's income. Not only is there a profit from the sale of the alcohol, but also from the byproduct of production, the used grain, which serves as excellent animal feed.

Consuming indigenous alcohol is preferred by older rural men. As this population declines it is possible that noncommercial alcohol production will also decline, negating the need for additional regulations.

Policy implications

If indigenous alcohol were taxed, it would be a source of revenue for the government. However, increasing the price will likely reduce demand, as price advantage is one of the major reasons for purchase cited by consumers. Some provinces have passed laws designed to regulate indigenous alcohol production, but it is unclear what their effect will be.

To the extent that some production facilities have become so large that they depend on distribution networks beyond personal contacts, the government likely has a responsibility to begin to regulate more carefully. This regulation could involve labeling, recording, and taxing. However, to supervise or regulate even these larger facilities would be daunting given their number. A different option for reducing risks could be limiting production and reinforcing the social networks associated with production and sale to reinforce the traditional controls placed on individuals' business actions by social bonds.

Introduction to the study

China is a vast and diverse country producing many types of commercial and noncommercial alcohol. As this was one of the first attempts to examine noncommercial alcohol it was decided to look closely only at distilled spirits.

Phase 1: The production of distilled spirits

From a practical perspective in these rural settings there can be few variations in the equipment or the procedures followed to produce distilled spirits from grain. A pot or kettle is needed to heat the grain, and space is required to lay out the grain to cool and to mix in the yeast. Next, containers are needed to hold the grain during fermentation, and then the same pot or kettle is used to heat the fermented grain to distill the alcohol. A source of cold water is needed to facilitate the distillation. The alcohol produced is then held in ceramic jars or plastic bottles and is sold directly to customers from these containers. Typically, the alcohol produced in the study sites is made from rice, sorghum, buckwheat, or corn. The availability of grain and the local taste, texture, and odor preferences dictate the types of alcohol produced, and vary from region to region.

Facilities and equipment for distilling alcohol from grain can be found in the back rooms of small shops or behind farmhouses near pens holding the animals that will consume the spent grains left over from the alcohol production. In the countryside or the villages, larger operations can be found in separate buildings resembling small factories. Direct sales occur from each of these locations. Customers typically bring their own containers into which the makers ladle the desired amount. Larger facilities, however, also sell their products through other small shops or restaurants or through local salesmen who may sell from small motorized vehicles.

The larger facilities typically display a business license and a production license, which are signs of periodic visits and inspections from the appropriate local authorities. In some locations these visits and observations are cursory, in others they are quite extensive and may even involve the analysis of samples of the alcohol produced.

We found that the alcohol content of these beverages ranges from 40% to 60% ABV. Prices depend on the strength of the alcohol (ABV), the grain used to make the alcohol, and the age of the alcohol. In these villages, alcohol made from sorghum sells for CNY 3 to 6 renminbi per jin, alcohol from buckwheat sells for 8 to 10 renminbi, alcohol from rice sells for 3 to 10 renminbi. (Output of noncommercial alcohol is measured by weight. One jin is equal to 10 liangs, or about 500 grams. One renminbi is equivalent to approximately USD $0.15.)

Specialty alcohols are produced on site or made at home. For example, one alcohol maker produces alcohol from glutinous rice (sweet sticky rice) and another adds osmanthus to his alcohol. At home many things—including local flowers, herbs, animal parts, insects, and reptile blood—may be added to the noncommercial alcohol, usually for medicinal purposes.

The critical variable affecting the quantity of distilled alcohol that can be produced is the size of the kettle (pot still) that is used to heat the grain before fermentation and then to reheat the fermented grain during distillation. Kettles ranged from 3 to 7 feet in diameter and from 3 to 6 feet in depth. The quality of the alcohol was attributed to the skill of the producer and to the quality of the yeast used in the production process. In some cases the yeast was purchased on the open market, while in others the alcohol makers produced their own yeast, usually following a family recipe.

Seller ladling alcohol into a customer's container from a ceramic jug. Other jugs in the background hold alcohol of different types and strengths.

In addition to these stationary manufacturing sites there are itinerant alcohol makers who travel from village to village contracting their services to local families. Itinerant distillers make sufficient alcohol for the family to last through the winter till the next harvest season. These itinerant alcohol makers carry their own kettles and typically work beside streams, which supply the water for pre-soaking the grain, heating the grain, and the cooling required for distillation. Alcohol produced this way is most likely to be truly noncommercial as it is produced only for the contracting family and is not sold or traded to others. The only commercial aspect of the activity is the payment to the alcohol maker.

Phase 2: Interviews with makers, sellers, community leaders, and consumers

All interviews took place in rural Hubei Province and were conducted by one of 10 local medical workers specially trained to conduct face-to-face interviews with community members. Eleven alcohol makers, 9 alcohol sellers, and 21 community leaders were interviewed. In addition, 218 community members were interviewed—158 individually and 60 in small groups. All 259 individuals interviewed answered a common set of questions about their alcohol consumption. Alcohol makers, sellers, and key informants answered additional questions. The objective of the survey was to generate a local view of noncommercial alcohol and the way it was consumed.

Alcohol makers

The alcohol producers we interviewed, all whom were men, told us that alcohol making was typically a family operation with assistance from one's wife and children. Occasionally others were hired to assist. None of the 11 alcohol producers we interviewed had any technical training in alcohol production. All had learned their craft from a parent or relative or by working for an established alcohol maker.

Annual production quantities ranged from 137 kg to more than 50 tons. Estimates of ABV were derived from reading a hydrometer or by a traditional *jiuhua* method that involved blowing down the side of a reed that was touching the top of the alcohol to create bubbles on the top of the beverage. The strength of the beverage is indicated by how quickly the bubbles dissipate.

All the alcohol makers were proud of their reputation and said they wouldn't do anything to their product that would harm their reputation. They described the social bond with their customers as an added value to their work, beyond any profit.

Alcohol sellers

Nine alcohol sellers were interviewed in their shops, which in some cases were also manufacturing sites. Four of the sellers were female and four had been in business for over 10 years. Sellers were generally ignorant of how alcohol was produced. They determined the quality of the products they sold by tasting and smelling and from feedback from their customers.

Like the producers, the sellers were concerned about their own reputation, which they sought to protect by selling only quality products. Typically the sellers knew the alcohol producers personally, but in one case a seller offered noncommercial alcohol that had been made in another province, supposedly because the product had a good reputation.

Community leaders

Twenty-one community leaders were interviewed to gain a better understanding of how noncommercial alcohol was viewed by different segments of the community. Key informant surveys are new in China and are treated with some degree of suspicion. In our case we interviewed only physicians, teachers, and local community officials. The local community officials held elected/appointed positions resulting from the developing democratization process in rural communities, and they had local decision-making responsibilities. The physicians interviewed were aware of local production sites, their location, and the types of alcohol produced. Teachers were less aware. Local community officials had the most detailed knowledge of local production, sites, and sales and how noncommercial distilled alcohol was produced and why it was popular with local residents.

Testing alcohol for ABV with hydrometer.

In response to questions about problems caused by noncommercial alcohol, physicians described medical consequences resulting from fights and overdoses. Teachers were concerned about possible problems related to excessive student drinking at holiday times. None of the community leaders identified any problems associated with alcohol. Collectively they described noncommercial alcohol consumers as older, rural, and mostly male. They said noncommercial alcohol was favored because it was traditional, often considered purer than commercial products, and cheaper. The taste was preferable to that of commercial products. Noncommercial alcohol was a popular choice for special events such as weddings and festivals, most likely because of its price. There was no hint of anything negative associated with the character of alcohol makers. There was a hint of suspicion about sellers who, it was believed, could be tempted to modify their product in the interest of making a profit.

Consumers

The sample of all 259 individuals consisted mostly of farmers and those involved in farm-related employment. The sample was 75.3% male. Seventy percent had no more than a primary or junior high school education. Of the males, 89.7% classified themselves as drinkers, as did 50.0% of the females.

Most consumers interviewed reported drinking more than one type of alcohol, but the preference among males was for noncommercial rice spirits (71.4%) and beer (56.6.%). Among females, the preference was for beer (75.0%) and noncommercial rice spirits (37.5%). In the hot summer months when farmers are busy in the fields, beer is preferred over spirits. These interviews were conducted in a rice-growing region, where most of the available noncommercial alcohol is made from rice.

Regarding consumption frequency, 82.9% of the male drinkers and 50.0% of the female drinkers reported having their last drink "today or yesterday," and 90.3% of the male drinkers and 62.5% of the female drinkers had drunk alcohol within the last week. Drinking alcohol was a common occurrence. Among the noncommercial alcohol drinkers, 22.0% reported drinking with breakfast, 80.0% with lunch, and 94.8% with dinner. Drinking occurred at home (84.4%) and with friends and relatives (47.4%). Drinking alone was not uncommon (58.9%).[2]

At the last occasion where noncommercial alcohol was drunk, 10.7% of the males and 42.1% of the females reported drinking no more than 2 liangs, a typical single serving (1 liang is approximately 50 g, or 1 jigger). An additional 64.5% of the males and 52.4% of the females consumed 3–4 liangs.

In this sample 28.0% of the male drinkers reported they had been drunk, but none of the women. Answers to a separate question indicated that 28.6% of the men and none of the women had on some occasion felt sick

2 In the United States these drinking practices could be seen as suggesting an alcohol problem. In China drinking alcohol is traditionally not viewed as a stigmatized behavior. Alcohol is considered a nutritional component of meals, an aid to health, a valued gift, and proof of courteous hospitality. As an unremarkable behavior, drinking is often underreported, especially by females. Because of the difference in how alcohol is viewed, we caution readers from alcohol-stigmatizing cultures not to view alcohol behaviors in other societies through their own ethnocentric lens. That is not to say there are no problems with alcohol. It does say that the typical Western "warning signs" of alcohol problems need to be used with caution when applied to another, very different society.

after drinking—nearly the same result for self-reported drunkenness and nausea.

Respondents identified reasons for drinking as "seeking a good mood" (48.5%), "dealing with a bad mood" (32.4%), "socializing with friends" (29.4%), and "overcoming tiredness" (14.7%). Reasons for drinking were not related to the type of alcohol drunk. When asked about the role alcohol played in their lives, consumers said it helped allay tiredness (42.9%), was good for health in small amounts (17.4%), was helpful with sleep (17.0%), and helped make friends (11.6%). In response to a separate question, 82.2% said moderate drinking was good for health and 52.9% said excessive drinking was bad for health. Another 79.5% said that drinking improves the atmosphere in social settings.

Phase 3: Chemical analysis

Thirty-six samples were collected from 9 manufacturers and 9 sellers during phase 1 interviews with makers and sellers of alcohol. The alcohols were made from unhusked rice (61%), sorghum (11%), buckwheat (14%), glutinous rice (6%), or a combination of grains and other materials (8%).

The makers and sellers we interviewed estimated their product ABV to range from 45% to 55%. The laboratory analysis showed ABVs ranged from 38.7% to 56.2%, with a mean of 49.5% and a standard deviation (SD) of 3.36. The mean methanol content was 4.73 mg/L, $SD = 2.17$. The mean for acetaldehyde was 109.27 mg/L, $SD = 76.56$. There was no evidence of extreme measures of harmful substances in any of the samples analyzed.

Phase 4: Survey in three provinces

Based on the phase 2 interviews with 259 villagers in rural Hubei, a more extensive questionnaire was developed by a panel of Chinese and American experts. This questionnaire was designed to provide a more detailed view of noncommercial alcohol consumption among a more diverse population. The questionnaire was pilot-tested and refined, and then used in interviews of 3,268 persons in rural areas of the provinces of Anhui (1,070), Hebei (1,088), and Hubei (1,110). In each province, representative rural communities were selected by persons knowledgeable of provincial demographics. Local community leaders were contacted and recruited to support the project, and local individuals and students in epidemiology and public health from major provincial universities gathered the data. The sample design called for approximately two-thirds of those interviewed to be males and one-third to be females; in reality the sample was 82.0% male. Of all participants, 91.9% were married, 61.9% were aged 45 and above, and 76.9% had no more than a junior high school education.

Drinking behaviors

One hundred percent of male and female respondents had consumed alcohol in the last year. Daily drinking among males was consistent across all three provinces (Anhui 35.5%, Hebei 34.5%, Hubei 35.3%). Among females the rates were less consistent (Anhui 11.5%, Hebei 16.9%, Hubei 5.0%). Drinking frequency in all three provinces is presented in Table 1.

Table 1. Frequency of drinking among all respondents.

Frequency of drinking	males	females
daily	35.1%	11.8%
3 to 6 times per week	29.8%	11.6%
2 times per week or less	35.1%	76.7%

In a question that allowed multiple choices, respondents were asked to report the type(s) of alcohol they "usually" consumed. The leading responses among males were noncommercial alcohol (55.7%) and beer (33.5%), and among females commercial spirits (49.2%), beer (39.4%), and noncommercial alcohol (39.0%).

Noncommercial alcohol

Information about beverage preferences is presented in Table 2.

Table 2. Alcohol beverage preferences by province and gender.

	First choice of beverage	Second choice of beverage
Anhui		
males	commercial spirits (58.0%)	noncommercial alcohol (25.9%)
females	commercial spirits (38.9%)	grape wine (20.1%)
Hebei		
males	commercial spirits (63.6%)	beer (18.4%)
females	commercial spirits (42.1%)	beer (35.6%)
Hubei		
males	noncommercial alcohol (48.0%)	commercial spirits (21.8%)
females	noncommercial alcohol (52.2%)	grape wine (15.7%)

Perhaps the most significant finding in this survey was that noncommercial alcohol consumption varied greatly from province to province. Among males, 51.0% in Anhui reported noncommercial alcohol as the beverage type they drink most often, compared to 32.5% in Hebei and 81.0% in Hubei. Among females, 36.1% in Anhui most often drink noncommercial alcohol, compared to 21.0% in Hebei and 63.9% in Hubei. It is worth noting that the original study of 259 residents was conducted in Hubei Province. According to this survey, noncommercial alcohol was consumed more widely and more liberally in Hubei than in the other two provinces.

Noncommercial alcohol drinkers were asked to estimate what proportion of their total drinking was accounted for by noncommercial alcohol. This estimate was to include noncommercial alcohols mixed with other products for medicinal purposes. The majority of males in Anhui (57.9%) and Hubei (67.6%) reported that at least half of the alcohol they consumed was noncommercial; only 26.8% of the males in Hebei reported the same. Approximately one-third of the females in Anhui and Hebei reported that at least half of the alcohol they consumed was noncommercial, but in Hubei the percentage was 46.8%.

Alcohol by volume in noncommercial alcohols was found to range from 40% to 60%. The majority of noncommercial alcohol consumers (males 80.3%, females 79.1%) indicated that they drank high-ABV noncommercial beverages.

Not only did the percentage of persons drinking noncommercial alcohol differ across the provinces, but so did consumers' estimates of the average amount they consumed on their drinking occasions over the last year. Males in Anhui estimated they consumed 2.5 liangs per drinking occasion in the last year, males in Hebei 2.6 liangs, and males in Hubei 3.1 liangs. Females in Anhui estimated they consumed 1.6 liangs, in Hebei 1.3 liangs, and in Hubei 2.2 liangs. When asked to make the same estimate but referencing only their last drinking occasion, all groups of respondents gave identical figures except Hubei females (2.9 liangs).

Reasons cited for choosing noncommercial alcohol included cost (35.9%), taste (27.1%), because it was provided by the host (10.9%), ease of access (7.5%), belief that it was good for health (6.7%), and quality (5.9%).

Adulteration is a risk associated with noncommercial alcohol. From time to time the press reports poisonings resulting from a producer or seller adding chemicals to their product. It is difficult to assess how widespread this practice is. This survey asked respondents whether they had heard of anybody getting sick or dying from noncommercial alcohol and found that 35.4% of the males and 32.9% of the females said they had heard of such an incident. When asked if they personally knew somebody who had gotten sick or died from drinking noncommercial alcohol, 14.7% of the males and 14.3% of the females said they did.

Generalizability

This study found significant differences across three Chinese provinces in noncommercial alcohol consumption. Therefore, based on this study, it will be very difficult to estimate, with any degree of certainty, the levels of noncommercial alcohol consumption in all of China's 17 provinces, four autonomous regions, four municipalities, and two special administrative regions.

Furthermore, this project examined only distilled spirits. No effort was made to explore noncommercial grape wines found in western China, the rice wines common in central and southern China, or any other alcohol products that are unique to smaller regions and minority populations.

Not frequently mentioned in discussions of noncommercial alcohol is the minimum ABV that would define a food or beverage as "alcohol-containing." For example, in some regions fermented rice porridge with a low ABV is commonly consumed at meals by family members of all ages. Is this fermented rice porridge considered alcohol? Is there a threshold ABV? Because food or beverages like this are commonly consumed in China, this question may have more relevance in the discussion of noncommercial alcohol in China than in other countries where noncommercial alcohols are illegal and/or usually have high ABVs.

What is clear from our study is that the strategies promoted in the West to reduce alcohol-related problems may not be as effective in societies where commercial and noncommercial alcohol play a different role in family and community life.

References

McGovern, P. E. (2003). *Ancient wine: The search for the origins of viniculture.* Princeton, NJ: Princeton University Press.

Temple, R. (1986). *The genius of China: 3,000 years of science, discovery and invention*. New York: Simon and Schuster.

Winchester, S. (2008). *The man who loved China*. New York: HarperCollins.

World Health Organization (WHO). (1999). *Global status report on alcohol* (WHO/HSC/SAB 99.11). Geneva: Author.

Interviewing villagers about noncommercial alcohol consumption.

India

Summary of research from Sikkim, Assam, and West Bengal

Amit Chakrabarti
Sikkim Manipal Institute of Medical Sciences[1]

B. B. Rai
Voluntary Health Association of Sikkim

Samiran Panda
National Institute of Cholera and Enteric Diseases

Context

Experts estimate annual alcohol consumption in India to be 0.57 liters pure alcohol per capita for recorded products and 2.04 liters for unrecorded products, according to 2005 figures (World Health Organization [WHO], 2011). The country is one of the largest alcohol producers in the world, contributing almost two-thirds of the alcohol produced in Southeast Asia. There is no state monopoly, and a license is required for the production and sale of alcohol. In India an alcohol content of 4% by volume qualifies a drink as an alcohol beverage. The minimum legal age for buying and consuming alcohol ranges from 18 to 25 across states, but age-restriction laws are seldom enforced.

Alcohol remains an important source of taxation revenue in India. Annual revenues of INR 216 billion rupees (USD $3.9 billion), however, are more than offset by losses of 244 billion rupees from adverse consequences of alcohol consumption (Gururaj, Girish, & Benegal, 2006). India has banned all alcohol advertising and has mandated that the labels of all alcohol beverages display the health hazards of drinking. Alcohol consumption in public places, including the workplace, is also banned. Industry associations in India have estimated that 15% to 20% of absenteeism and 40% of work-related accidents can be attributed to alcohol consumption (Saxena, 1997).

India has a rich tradition of noncommercial alcohol consumption and production. A popular licensed variant of noncommercial alcohol known as country liquor is distilled from cheap, locally available raw material such as sugarcane, rice, palm, coconut, or cheap grains, and contains 25% to 45% alcohol by volume. Common varieties of country liquor available across different parts of India include arrack (from paddy or wheat), *desi sharab*, and *tari*. Country liquor is subject to excise duties but at lower rates than those for commercial beverages.

Because licensed alcohol beverages are considerably more expensive, illicit liquor is popular among people at lower socioeconomic levels. In many parts of India, the production and marketing of unrecorded alcohol is carried out as a cottage industry. Palm wine and toddy, a sweet drink from coconut palm with an alcohol content of 4% to 6%, are popular in Southern India. Also common in various areas of the country are rice beers such as *hadia* and *chang* and a rice wine called *apong*. Jackfruit wine has an alcohol content of 7% to 8%, while *mahua*, distilled from flowers of the mahwa tree, has an alcohol content ranging from 20% to 40%. *Zu* and *Rohi*, brewed in the northeast, have an alcohol content of 10% to 20%.

Illicit liquor is mostly produced clandestinely in small batches with raw materials similar to those used for licensed country liquor. However, the products are frequently adulterated. With no legal quality-control checks in place, alcohol content of illicit products can be as high as 56%. Industrial

In parts of Assam and Sikkim, noncommercial alcohol production is a source of livelihood for many women, as they are often the ones who carry the finished product to local markets.

1 Author affiliation included for purposes of information only.

methylated spirit is a common adulterant, which can cause sporadic incidents of mass poisoning that can result in death or irreversible eye damage. In addition, noncommercial alcohol is frequently laced with so-called "white" tablets, which are most likely hypnotics such as diazepam.

Description of the study

A study to assess the nature and extent of noncommercial alcohol consumption and production in India was conducted in two rural and two urban sites in Sikkim, two rural sites in Assam, and two urban areas in West Bengal. Assam and Sikkim, in the northeastern part of the country, and West Bengal, in the east, are states with distinct cultural characteristics as well as their own traditional alcohol beverages. Unofficial estimates and key-informant observations suggested that the sites selected for study have high rates of noncommercial alcohol consumption and production.

Across all sites, a total of 1,207 subjects responded to a generic questionnaire to measure sociodemographics and alcohol consumption, the CAGE questionnaire to assess alcohol dependence, and the SF-36 questionnaire to measure quality of life.[2] In addition, 1,137 participants kept a 30-day diary to record alcohol consumption and the context in which drinking took place.

Most study participants were men. Women accounted for 30% of participants in rural Sikkim and rural Assam and 16% in urban Sikkim. Women participants were also consumers of noncommercial alcohol, particularly in rural Assam and Sikkim. There is increased social acceptance of drinking by women, and women's drinking patterns are generally similar to men's. Many women have access to noncommercial alcohol because they prepare it at home. In parts of Assam and Sikkim, noncommercial alcohol production is a source of livelihood for many women, as they are often the ones who carry the finished product to local markets.

2 The CAGE questionnaire consists of four questions and is used to screen individuals for alcohol dependence. A score of 2 or more is considered an indicator of problem drinking.

The 36-item Short-Form health survey (SF-36) measures patient-reported physical and mental health and overall quality of life.

Distillation at a community festival in Dimoria area, Assam. The bottom container contains rice, the middle is for distillation, and the top contains water.

Findings

Noncommercial beverage preferences

In rural Sikkim, the two most popular noncommercial drinks, each preferred by about 45% of the population surveyed, are *jaanr* (a drink with a low alcohol content made from fermented corn, millet, or rice) and *chang* (a low-alcohol-content beer made from fermented boiled rice). Both *jaanr* and *chang* can be prepared at home. In urban Sikkim, *raksi*, a distillate with a high alcohol content that cannot be produced at home, is the most popular beverage (preferred by about 60% of respondents), followed by *jaanr* (preferred by about 20%). *Raksi* is manufactured in urban production facilities and made available through local resellers.

In urban West Bengal the most common noncommercial alcohol drink is *hadia* (a rice beer similar to *chang*), followed by *bangla* and *chullu* (distillates of a type of low-grade molasses that is often used as cattle feed). The alcohol content of *bangla* and *chullu* is 40% to 50%, similar to that of *raksi*. Consumption of commercial beverages such as beer, brandy, and rum is almost nonexistent in rural Sikkim and urban West Bengal, and takes place among only a minority of participants in urban Sikkim. Almost all participants in rural Assam drink *chulai*, or *photika*—a distilled form of *laopani,* a homebrew made just after rice is fermented. *Chulai* is mostly sold commercially, while *laopani* is used for domestic consumption.

In West Bengal, which is culturally and ethnically distinct from Assam and Sikkim, there are strong socioeconomic divisions among drinkers. Alcohol consumers in the upper socioeconomic group prefer commercial beverages, the tribal people of the area prefer *hadia*, and those who earn their livelihood from heavy labor tend to consume *bangla* and *chullu*. No similar class division in beverage preferences was observed in Sikkim, where noncommercial beverages are consumed by people from all socioeconomic levels, particularly during festivals, on religious occasions, and during family celebrations. This is possibly related to stronger assimilation of noncommercial beverages into the culture and tradition of Sikkim.

Noncommercial alcohol in urban West Bengal is produced and procured mostly in the *basti* (slum) areas. Most production areas are clandestine and not easily accessible. However, availability has now become so widespread that noncommercial alcohol can be obtained at almost any place in a given neighborhood, particularly areas populated by lower socioeconomic groups. Noncommercial beverages are frequently sold camouflaged in soft drink bottles. The alcohol is made mostly from rice, molasses, or millet, and often the rice comes from the public distribution system.

Questionnaire results

According to the questionnaire on alcohol consumption and sociodemographics, the mean age for first drinking alcohol ranged from 20 years (rural Sikkim) to 24 years (urban West Bengal), although the lowest reported ages were 8 and 10 years in Sikkim and Assam, respectively. The mean lowest age for initiating regular consumption of alcohol was 22 years (rural Sikkim), although the lowest reported ages for regular consumption were 9, 10, and 13 years in urban and rural Sikkim and Assam, respectively. The highest mean number of drinking days in a 30-day period was recorded in rural Assam (23 days).

As expected given the lower socioeconomic status of noncommercial alcohol consumers, many participants across all study sites were illiterate (27.3%) and most had dropped out of school before completing 10 years of education (59.3%). Average monthly earnings of participants ranged from INR 3,578 rupees (USD $65) in rural Sikkim to 6,041 rupees ($109) in urban Sikkim. Average monthly expenditure on alcohol consumption ranged from 436 rupees ($7.87) in rural Assam to 976 rupees ($17.62) in urban West Bengal. Average daily expenditure on alcohol ranged from 16 rupees ($0.30) in rural Assam and 25 rupees ($0.50) in rural Sikkim to 35 rupees ($0.60) in both urban Sikkim and West Bengal. These amounts are significantly less than would be required to consume legal alcohol on a daily basis.

Drinking patterns

The study identified significant problem drinking among the participants and underlined the need for public health

A vending place in Siliguri area, West Bengal.

measures to control harmful drinking. A high percentage of participants in all sites had scores of 2 or more on the four-question CAGE questionnaire: 86% in rural Sikkim, 66% in urban Sikkim, 81% in rural Assam, and 99% in urban West Bengal. According to the 30-day diaries, participants from all sites consumed noncommercial alcohol almost daily, including on weekends. An especially high rate of daily consumption was observed among participants from West Bengal, where almost 90% drank daily.

Daily quantity of alcohol consumed was measured in number of bottles, with one bottle containing 750 to 1,000 ml. Average daily consumption in rural Sikkim and urban West Bengal was approximately 1 bottle per day per participant. There were no differences observed between weekdays and weekends in the amount consumed. Consumption was approximately 1.75 bottles per day per participant in urban Sikkim. Participants from rural Assam recorded the lowest daily consumption—approximately 0.75 bottles per participant.

Contexts of drinking

Most participants had their first drink of the day by 9:00 or 10:00 a.m. Daily drinking ended at approximately 6:00 p.m. in all sites in Sikkim and Assam, and at approximately 8:00 p.m. in West Bengal, which is more urban. Absence of late-night drinking can be attributed to the professions of participants, which mandate an early start to workdays: a large percentage of participants from rural Sikkim (65%) and Assam (29.3%) were engaged in agriculture, while many participants from urban Sikkim (46.7%) and urban West Bengal (45%) were laborers.

According to the diaries, about 90% of participants from rural Sikkim preferred to drink in bars and homes. Participants in urban Sikkim also drank in bars, homes, and neighborhoods, but about 20% also drank in facilities where the beverages were produced. In contrast, 75% of participants from rural Assam, where there are a limited number of bars, drank almost exclusively in production facilities. Most noncommercial alcohol available in Sikkim is produced in rural areas, where many households produce their own beverages and sometimes sell them outside the family. Consumption of noncommercial alcohol is also more rooted in the culture of rural Sikkim, which is another indicator of more home-based noncommercial alcohol consumption.

Bars in rural areas serve noncommercial alcohol more frequently than do bars in urban areas. Almost all participants from urban West Bengal reported consuming noncommercial alcohol in the neighborhoods and at production facilities and secret locations. Noncommercial alcohol is not available in the licensed bars of West Bengal, which serve only more expensive liquor that is unaffordable for the population surveyed. There is little home-based consumption reported because production and consumption of noncommercial alcohol is not part of the culture in urban West Bengal.

About 80% of participants in rural Sikkim reported drinking with their family members, friends, and neighbors. Although most participants in urban Sikkim also drank with their family, friends, and neighbors, approximately 30% drank alone. In urban West Bengal, most participants drank with friends or alone, not with their families. In Assam most drank with friends and neighbors; however, there was almost no drinking within the family.

Participants in rural Sikkim reported that they almost always consume noncommercial alcohol on special occasions and during festivals, while most participants from urban Sikkim said they drink even when there is no specific occasion involved. Participants from urban West Bengal and rural Assam identified socializing with friends as the most common reason for drinking noncommercial alcohol.

Quality of life

Almost all study participants indicated that they felt no adverse effects of noncommercial alcohol. This suggests that consumption of noncommercial alcohol is integrated into their lives, whether by culture or by habit. In addition, 85% of all participants said that their current overall health was good. However, 26% of all participants said that their overall health was worse than it had been during the previous year, a figure that was higher (50%) among participants in urban West Bengal.

Participants from rural Assam and urban West Bengal commented that drinking had some beneficial effects, such as inducing relaxation, relieving body aches and fatigue, and improving sleep. However, there were significant differences between these two sites in participants' quality of life. In measures of overall emotional and physical health, rural Assam participants reported the best quality of life of all study participants, with about 60% saying that they had experienced no psychological problems (depression or anxiety) or physical limitations in the past month. In contrast, only 15% of participants in West Bengal reported that they had experienced no physical or emotional limitations.

Almost 20% of study participants had a history of migration, a social stressor that may play a role in alcohol consumption behavior. Also noteworthy is that approximately 64% of all survey participants reported that one or both parents currently consume alcohol. In addition, 60% of all participants indicated that at least one sibling currently consumes alcohol, and 92% indicated that at least one of their friends currently consumes alcohol. This is a significant finding, given that family, friends, and peers influence drinking behavior.

Chemical analysis

Chemical analysis was performed on 35 samples of noncommercial alcohol products collected from four study sites in Sikkim and two in West Bengal. The samples contained moderate ethanol content ranging from 20% to 27% by volume; by contrast, commercial spirits such as gin, rum, whiskey, and vodka usually contain at least 40% alcohol. The pH of the samples analyzed was generally comparable to that of legal alcohol beverages.

Methanol concentrations in all samples—even for distilled beverages such as *raksi, bangla*, and *chullu*, which are known to sometimes be adulterated—ranged from 0.32% to 0.57% v/v, which is lower than the maximum tolerable concentration of 2% v/v. The low methanol content is not surprising because these beverages are mostly made at home or for neighborhood consumption.

Almost all samples of *jaanr* from Sikkim contained copper, as did almost half of all other noncommercial samples collected. This was most likely caused by contamination from metal vessels used in production. The content of lead and zinc was insignificant. All samples tested positive for biologically active substances, most likely agricultural or plant products used in production.

References

Gururaj, G., Girish, N., & Benegal, V. (2006). *Burden and socio-economic impact of alcohol use: The Bangalore study.* New Delhi: World Health Organization Regional Office for South-East Asia.

National Workshop on Alcohol Policy (1997). *Summary and recommendations: Health perspectives*. New Delhi: All India Institute of Medical Sciences.

Saxena, S. (1997, January 14). *Memorandum to World Health Organization*. Geneva.

World Health Organization (WHO). (2011). *Global Information System on Alcohol and Health (GISAH)*. Retrieved from http://www.who.int/substance_abuse/activities/gisah/en/index.html

Kenya

Summary of research from Kibwezi and Kangemi

David Ndetei
University of Nairobi/Africa Mental Health Foundation[1]

Anne Mbwayo, Victoria Mutiso, and Lincoln Khasakhala
Africa Mental Health Foundation

Context

Traditional drinks, which include home-brews and home-distilled beverages, account for an estimated 74% of the total alcohol consumption in Kenya (Odalo, 2007). The different tribes of Kenya have always had a traditional brew, made in various ways, including from sorghum and millet, sugar cane and honey, and even from the palm trees in Kenya's coastal region. There is great variation in drinking practices among African societies, and within one society different contexts might be associated with different cultures of drinking. For example, in some cultures alcohol is consumed at specific times by people (mainly men) who have attained a particular age or status (Willis, 2006).

Although the manufacture, sale, and consumption of such beverages are not reflected in official government statistics, they represent an important part of local economies. Whether in urban or rural areas, nonregistered beverages are now very largely commercial: drink is made to sell. For example, in rural Africa many women engage in the production and sale of traditional beverages as their main commercial activity and as a means of supporting their families. Moreover, since these products are untaxed and can use low-cost ingredients and production methods, they tend to be cheaper (volume for volume) than their commercial counterparts. Although the products are sometimes illegal and police raids are carried out, producers, distributors, and sellers often buy their way out (Obot, 2006).

Many noncommercial alcohol beverages are produced in Kenya, including the distilled beverage *changaa* and the brews *busaa*, *muratina* (*karubu*), and *miti ni dawa*. The consumption of noncommercial alcohol is highest among the poor, who cannot afford to participate regularly in the "national" culture of bottled beer, much less the elite world of whiskey and clubs. Instead they drink cheap, locally made beers or spirits from the informal sector, many of them produced in innovative ways with novel ingredients (Willis, 2006). Because some of these beverages are produced illegally in hidden, unhygienic conditions, they are not always inspected for consumer safety. To maximize profits, many producers or distributors add certain chemicals to enhance the brew's potency, and some people have lost their sight or their lives after consuming these beverages (Odalo, 2007). Despite hygiene and safety issues, these drinks continue to be consumed because they are the only beverage alcohol that many people can afford.

The Alcoholic Drinks Control Act of 2010 legalized the production and sale of *changaa* under certain conditions, including passing inspection by a government body, adhering to standards of production and packaging, and restricting sales to certain hours. However, many producers and sellers do not comply with the law, and low-quality and adulterated beverages continue to be sold.

Two-thirds of consumers interviewed reported earning less than KES 4,000 shillings (USD $47.60) per month.

1 Author affiliation included for purposes of information only.

Description of the study

To learn more about the nature and extent of noncommercial alcohol in Kenya, we collected data from two sites: the urban site of Kangemi, an informal settlement in the western part of Nairobi, and the rural site of Kibwezi Division, in Kibwezi District, located 180 kilometers east of Nairobi. A later phase of the research was conducted across the larger Kibwezi District. The study had the following objectives:

- to examine the patterns of production, sale, and consumption;
- to analyze the composition of noncommercial alcohol products;
- to examine the views and attitudes of stakeholders regarding the production, sale, and consumption of noncommercial alcohol;
- to establish whether the people who consume noncommercial alcohol suffer from any mental or physical alcohol-related problems.

The study included the application of a diary method to gather patterns, types, and amount of noncommercial alcohol consumed by the sample population over the course of 30 days; interviews with producers and sellers to analyze the types of alcohol being produced, sold, and distributed; and chemical analysis of samples of noncommercial alcohol beverages purchased from producers and sellers. Interviews with key informants (government administrators, religious leaders, and law enforcers) were conducted to gather additional contextual information on noncommercial alcohol in each study site.

Complete setup of the distillation process for *changaa* production.

Findings

Consumers

Men made up 81% of the 320 consumers interviewed in the initial phase of the study. Most of the consumers interviewed are casual laborers, and a few in Kibwezi work on farms. The majority have only a primary-school education (8 years of basic schooling), and most have very low income. In the sample of consumers from across the Kibwezi District, two-thirds reported earning less than KES 4,000 shillings (USD $47.60) per month.

More than half of the consumers reported having their first drink by the time they were 20 years old. One in six consumers began drinking by age 15.

Most of the alcohol beverages consumed by the sample are noncommercial. In rural Kibwezi the consumption of *muratina* (*karubu*) is most common, followed by *changaa, busaa,* and *miti ni dawa*. In urban Kangemi, consumption of *busaa* and *changaa* is most common, followed by *muratina* and *miti ni dawa.* Consuming more than one type of alcohol drink is common, especially in Kangemi, with *changaa* being consumed in addition to other drinks. *Changaa* is classified as a spirit and therefore is the choice of those who want to get drunk quickly. *Busaa* is described as food-drink (*chakula-kinyanji*), because it looks like porridge and is rather satisfying. Mixing noncommercial drinks with commercial ones is not common, but it occasionally occurs among the few individuals who have a relatively high income.

The time of day when consumers start drinking varies. Most consumers in Kibwezi reported that they begin drinking in the afternoon. Due to differences in serving sizes and product strength, the volume of

pure alcohol consumed per capita could not be assessed within the scope of this study.

In the sample of consumers from across Kibwezi, 76.5% reported that they drink with their friends. Daily drinking was reported by 84% of consumers across Kibwezi. Many consumers from both sites use other substances besides alcohol, mainly tobacco, followed by *khat* (*miraa*) and cannabis (*bhangi*), with very few using cocaine and sedatives.

In Kibwezi, alcohol is mainly consumed in the home of the brewer or the seller, which is referred to as a den. The dens sell *muratina* (*karubu*) or *busaa*, depending on their specialty. Licensed bars in Kibwezi usually sell commercial alcohol in the front section and noncommercial alcohol in the back. This trend was not reported in Kangemi.

In Kangemi, *changaa* is sold from houses that give no indication alcohol is for sale there. Individuals drinking noncommercial beverages sold in these houses could pass as normal visitors. One knows that *changaa* is sold there only through introduction by other consumers, which helps unlicensed sellers avoid arrest. *Busaa* is brewed in Kangemi in places consumers call clubs. These clubs also sell *changaa*, but not openly. The selling of *busaa* and *muratina* is not viewed to be as bad as selling *changaa*.

Among the positive effects reported were reduction of stress, ease in talking with others, meeting and making new friends, sleeping well, getting the energy to work, reducing pain, relaxing after a hard day's work, finding happiness, getting a good feeling, and providing a way of socializing and forgetting one's problems.

Half of all consumers showed signs of a major depressive disorder, according to the MINI Plus neuropsychiatric interview. Only 22.8% of consumers from the initial phase said that the alcohol they consumed had a negative effect on them. These negative effects involved family problems, mentioned by 41.0% of those reporting problems, and medical problems, noted by 9.5%. Other problems included involvement in physical fights, being arrested by the police, uncontrollable bowel movements, and sleeping in ditches.

Sellers

All of the 8 urban and 9 rural sellers interviewed for the initial phase were women, who sell primarily because they are poor and need money for basic necessities. Some

A drinking den. *Muratina* is stored in the large container at far left. A sieve for straining the beverage is on top of the red cup.

Water harvesting and storage at the home of a *changaa* brewer.

also mentioned being unable to do heavy work because of health problems. They primarily sell *changaa*, which is produced outside their local area and must be brought in through a chain of distributors. Two sell *busaa*, one sells *miti ni dawa*, and one sells *muratina*. The *muratina* and *busaa* sellers interviewed produce those beverages themselves.

When asked how they ensure that they sell quality products, sellers said that they use clean containers for storage and serving. Others said that they always taste the drinks before they buy them, so that if the product does not meet their standard, they do not buy it. Still others said that they buy from only a few trusted people, since customers are aware of drinks that have caused death. Sellers also argued that if they sold bad drinks, they would lose their customers and their livelihood. For them it is serious business. The second phase of the study, covering the larger Kibwezi District, found that the 11 sellers and distributors interviewed earned an average of 27,628 shillings ($330) during the month of the study.

Products are stored in 20-liter plastic containers. These containers could be bought specifically for alcohol production or they could be bought secondhand, especially from hotels or other institutions. Smaller quantities of noncommercial beverages for sale are stored in plastic bottles that previously contained water or juice.

Sellers described their clients as people from within the area who want to get drunk quickly without spending much. The clientele includes builders and other casual laborers, *matatu* (minibus) and taxi drivers, touts, jobless youth, village elders, housewives, retired civil servants, and teachers.

Producers

All 21 producers interviewed in Kangemi and Kibwezi Division said they produce alcohol because they are poor and need money for basic expenses, including their children's education. Other reasons given are that noncommercial alcohol is easy to produce and there is demand for it. The 17 producers interviewed across Kibwezi District were found to earn an average of 32,502 shillings ($387) per month.

The producers mainly produce *busaa*, *muratina* (*karubu*), and *miti ni dawa*. In Kibwezi Division, 11 producers make *muratina,* the area's traditional beer, and 3 produce *busaa.* In Kangemi, *muratina* and *busaa* are produced in equal proportion among the 7 producers interviewed. Both are traditional drinks in different communities, but because

in cosmopolitan Kangemi all tribes are represented, all types of alcohol drinks are produced to meet their varying preferences. Very few people produce *miti ni dawa*, which is perceived as being a medicinal drink.

The equipment used is simple. It includes *sufurias* (metal pots) or drums when there is need for boiling, plastic containers when the fermenting procedure does not require heating, a big sheet of metal for drying the fermented sorghum, a wooden stick for stirring, and a plastic sieve. Production of the different alcohol beverages is described below.

- In *muratina* production, the muratina fruit is put in containers to which water is added. Sugar and honey are then added to hasten the fermentation process. This mixture is left near the fire for five to seven days before it becomes ready for consumption.
- *Busaa* is made from flour of maize and sorghum that has started to ferment, to which sugar is added to increase fermentation.
- *Miti ni dawa* production involves boiling various parts of trees or shrubs said to be medicinal and then adding honey and sugar.

High standards are reportedly achieved by using the required ingredients, such as honey for *muratina* and *miti ni dawa*. Producers said that they follow the necessary procedures and use clean equipment.

The yeast-based beverage *pombe maziwa* ("alcohol milk") and a package of some of its ingredients.

Those using cereals said they do not use spoiled ingredients. Producers also said that they avoid contamination of the finished product by ensuring that all containers are sealed. Alcohol produced is stored mainly in plastic containers, though some producers use drums. Producers sell their alcohol in small quantities to neighborhood people and visitors to the area who consume at the brewing sites, called dens or clubs.

Key informants

Key informants interviewed agreed that the consumption of noncommercial alcohol is widespread among low- and middle-income earners, youth and the middle-aged, and males and females. They noted that consumption takes place daily and at any time of the day. Noncommercial beverages are favored because commercial beverages are too expensive for the majority of consumers.

The principal reason for the production of noncommercial alcohol is to earn a living, as the unemployment rate is high and most people are poor and must find a way to meet their daily needs. The modes of production and the places of consumption are not hygienic, especially in urban Kangemi. Producers and sellers tend to be women, while men go out to look for casual jobs.

Many informants interviewed feel that the youth have become addicted to alcohol and that an increase in sexual immorality accompanies the consumption of alcohol. It was noted that those seeking treatment for alcohol problems can go to a rehabilitation center at the urban site. However, there is no such center in the rural site, so people must go to the hospital if they feel unwell.

Chemical analysis

Eleven beverage samples from the study sites were collected for chemical analysis. In Kibwezi, two samples contained traces of lead and one sample had copper content well above the recommended limit. Methanol was not detected in any of the samples.

The three *changaa* samples ranged in ethanol content from 15.3% to 20.5% alcohol by volume. Samples of *busaa*, *muratina*, and *miti ni dawa* ranged from 3.9% to 5.4% alcohol by volume.

Conclusion

The study confirmed that poverty is a significant factor in the noncommercial alcohol market in Kenya. All producers and sellers reported that they engage in the trade because there is demand for the product and they need a source of income. Most consumers have very low income and choose noncommercial beverages because they cannot afford commercial ones. These consumers face numerous physical and mental health risks from the daily consumption of beverages often produced in unsanitary conditions as well as from using other substances and having poor access to healthcare. Despite the government's efforts to legalize *changaa* and improve product safety, many producers do not wish to spend the time and money to obtain a license for production, so consumers continue to be at risk of drinking low-quality beverages.

References

Ndetei, D. M., Khasakhala, L. I., Ongecha-Owuor, F. A., Kuria, M. W., Mutiso, V., & Kokonya, D. A. (2009). Prevalence of substance abuse among patients in general medical facilities in Kenya. *Journal of Substance Abuse*, *30*(1), 182–190.

Obot, I. S. (2006). Alcohol use and related problems in sub-Saharan Africa. *African Journal of Drug and Alcohol Studies*, *5*(1), 17–26.

Odalo, B. (2007, March 7). They are blind and want justice over killer brew. *Daily Nation*.

Willis, J. (2006). Drinking crisis? Change and continuity in cultures of drinking in sub-Saharan Africa. *African Journal of Drug and Alcohol Studies*, 5(1), 1–15.

Mexico

Summary of research from the municipalities of Chimalhuacán and Chalco

Juan Manuel Gordillo
Global Mind Mexico[1]

Context

Estimates based on national surveys suggest that annual alcohol consumption per adult in Mexico is 4.6 liters pure alcohol from commercial sources and at least 1 liter from unregistered sources. Distilled beverages are the largest contributor to the noncommercial alcohol market. For every two distilled drinks in the formal market, it is estimated that approximately one is consumed in the unregistered market. Studies have estimated that distilled beverages account for 30% to 40% of the noncommercial alcohol market in Mexico, a market that also includes prepared beverages and raw alcohol generally reserved for pharmaceutical and industrial use (Medina-Mora, Robles, Gordillo, & Villatoro, 2011).

Studies have shown that producers of noncommercial alcohol include large-scale established companies and small-scale home distillers. The former dispense surpluses or special orders, while the latter supply local markets with products that are generally assumed to be homemade. In some regions of the country, noncommercial alcohol may account for more than half of all alcohol consumed.

Among the alcohol beverages long popular in Mexico are fermented beverages, especially pulque, which is made from the juice of a specific variety of agave. Its production can be traced to pre-Colombian times, when it was linked to ceremonial festivities. Although the pulque market was undermined by the boom in beer production from 1925 to 1935, it remains especially strong in Mexico's rural high plain.

The importation of stills from Spain and the Philippines in the 16th century led to the appearance of mezcals, agave distillates that continue to be the choice of many spirits consumers and are in some cases part of the noncommercial alcohol market. In the mid-17th century, the production of distilled "mezcal wine," a precursor of tequila, was allowed in the state of Jalisco under conditions of obtaining a license and paying special taxes. Elsewhere in the Mexico the production of distilled beverages remained banned, which led to underground production and sale.

Another product that developed on the legal fringes was aguardiente ("firewater"), produced from sugarcane. Aguardiente was in high demand by the growing populace and was prominent in an underground economy that eluded governmental provisions and taxation. In the mid-18th century, the tension between illegal production and the directives of the Spanish Crown led to the creation of a special court for banned beverages. The number-one sanctioned product was aguardiente, whose proliferation reflected a constant demand for affordable alcohol products. Government officials were among those most interested in preserving the aguardiente trade, either because they owned raw materials or production facilities or because they were paid to look the other

The typical consumer of unregistered alcohol products is a male under 35 years of age who works informally, earns less than $105 a week, and is not inclined to drink beverages with low alcohol content, including legal beverages such as beer.

1 Author affiliation included for purposes of information only.

way. Religious festivities also encouraged the production and consumption of alcohol beverages. In addition, there was consensus that people who were drunk when they broke the law should not be sanctioned in the same way as those who intentionally committed a crime.

The production of aguardiente was legalized near the end of the 18th century, and the subsequent reduction in price drove a rise in consumption. The Mexican Revolution in the first quarter of the 20th century plunged the country into an economic recession that affected agriculture and the national beverage alcohol industry. An official national anti-alcoholism campaign began in 1929 to regulate and tax the production and sale of alcohol beverages, but the alcohol black market continued to thrive in an era of economic and political instability.

During the 1920s, as demand for illicit alcohol grew in the United States in response to Prohibition, large alcohol producers and distributors flourished in Mexico along the northern border, in the ports, and in maritime customs. The black market, linked to organized crime, encouraged smuggling to the United States and illegal consumption in cantinas, brothels, and casinos.

Industrialization and protectionism in the middle of the 20th century favored domestic production. The informal market for alcohol, especially distillates, continued to prosper, spurred by tradition and the growth of a large marginalized population in the lower socioeconomic strata. Conditions were favorable for the rise of informal-alcohol markets that targeted the large consumer population in urban areas.

Taking measure of the market

To arrive at more definitive measures of the current noncommercial alcohol market, this study gathered data on the production, distribution, and consumption of noncommercial alcohol using household and individual questionnaires, interviews, focus groups, and personal diaries. The study also included in-depth interviews with experts in the noncommercial alcohol market and chemical analysis of beverage samples collected in the process of field research.

The study areas selected were the municipalities of Chimalhuacán and Chalco in the Metropolitan Area of the Valley of Mexico (ZMVM).[2] The choice of study sites was based on information provided by the National Addictions Survey (Instituto Nacional de Salud Pública, 2008), which described the State of Mexico and the ZMVM as the most populous areas in the country and the country's largest market for alcohol. The study areas themselves are not known to produce unregistered beverages, which instead are commonly brought in from states in the central and southern portions of the country, especially Jalisco and Oaxaca. There is also evidence that noncommercial alcohol from the country's eastern zone has penetrated the ZMVM, and that illegal activities are tolerated by officials responsible for overseeing unregistered alcohol production, distribution, and consumption. The urban character of the chosen study sites served to complement a preliminary study that took place in 2010 in Amatitán, Jalisco, which has a semi-rural environment (Gordillo, 2011).

Findings

Questionnaires and interviews

According to questionnaires and interviews, one-third of the surveyed population initiates consumption of alcohol between 14 and 17 years of age. Heads of household highly influence their families' consumption patterns. Study statistics confirm that children of habitual drinkers are more likely than children of nondrinkers to be frequent drinkers.

The typical consumer of unregistered alcohol products, such as pulque, pure alcohol, and aguardiente, is a male under 35 years of age who works informally (e.g., as a street vendor), earns less than $105 a week, and has living conditions consistent with a low socioeconomic level. He is not inclined to drink beverages with low alcohol content, including legal beverages such as beer. He drinks more often in a month than a typical consumer who drinks primarily commercial beverages, and he prefers to drink alone, whether in the street or at home. By

2 The ZMVM (Zona Metropolitana del Valle de México) includes Mexico City (the Federal District) and parts of the State of Mexico, one of 31 states in the country.

contrast, consumers of commercial beverages, who made up the majority of the study sample, prefer beer and tequila, which they usually consume in social circles of friends and coworkers and in family surroundings.

Prices of commercial and noncommercial alcohol beverages vary widely. According to respondents, some noncommercial spirits are sold for as little as USD $0.71 a bottle. The lowest reported price for tequila was $1.42 per bottle, probably for an unregistered product. Aguardiente had an average price of $1.78 per bottle.

Beverage product safety appears to have little influence on consumers' decision to purchase unregistered alcohol. Seven out of ten people interviewed believe that alcohol products sold in bulk or in plastic containers are no less safe than commercial products. Chemical analysis revealed that 18 of the 20 samples collected during the study met national safety standards for alcohol beverages. The mean alcohol content by volume of these samples was 30.93%.

The study found that noncommercial alcohol accounts for 20% of all alcohol consumed in the study sites, a finding similar to the results of an earlier study in the state of Jalisco, where 23% of all alcohol consumed was found to be unrecorded (Gordillo, 2011). Beer makes up 63% of the total alcohol market in Chimalhuacán and Chalco, and the remaining 17% is accounted for by other commercial beverages.

It is estimated that noncommercial beverages account for 45% of all distilled beverages sold. One-third of these noncommercial distillates are labeled "tequila," 23% are pure alcohol, 16% are aguardiente, 9% are mezcal, and products such as brandy, wine, vodka, rum, and whiskey account for the remainder.

Consumer diaries

The 28-day consumption diaries kept by some study participants described the context in which drinking took place, which included aspects of daily events (e.g., whether a normal day, holiday, or a day when a celebration of some kind occurred), characteristics of the beverages consumed, the environment in which alcohol was consumed, and the effects of consumption. The consumption of noncommercial beverages was observed in 11% of the 644 consumption occasions recorded in the diaries, and the prices of the beverages consumed varied widely.

The data from the diaries corroborate information from the individual surveys showing that weekends have the highest concentration of alcohol consumption, especially for beer and tequila. Approximately 60% of all consumption in a typical week takes place from Friday to Sunday. According to data from the questionnaires, 83% of those surveyed believe that celebrations including civic and religious holidays are suitable occasions to consume an alcohol beverage. The diaries confirmed that on special occasions consumers were more likely to drink higher-priced beverages such as tequila, whiskey, and brandy.

Consumers are well acquainted with the distribution channels for noncommercial alcohol, which commonly include merchants, acquaintances, relatives, and friends who sell products made in regions recognized for their traditional beverages. There are also market channels offering both registered alcohol and traditional products. Points of sale include homes, shops, restaurants, bars, and cantinas.

According to the diaries, the decision to purchase unregistered alcohol is related to the number of people accompanying the drinker at the time of purchase, the reason for drinking, the price of the beverage, and the type of location at which consumption will take place. Men made 95.8% of unregistered alcohol purchases.

The study results pointed to two main categories of noncommercial alcohol consumers. One group of consumers tends to drink alone to improve their mood, forget their problems, or become intoxicated. A larger group tends to drink socially, usually in semi-urban locations.

Conclusions

Among the reasons for a thriving noncommercial alcohol industry in Mexico are government corruption and a history of laxity in implementing governmental regulations, which allow producers of unregistered

alcohol to operate freely and without sanctions. In addition, there is growing social tolerance for the consumption of unregistered alcohol, due in large part to the availability and low price of such products and also because of the growing spread of poverty in the country. Because low-income consumers can typically afford only low-priced noncommercial alcohol, we anticipate that as long as there is no improvement in the economic situation of these individuals, their options for alcohol beverages will remain limited.

The freedom with which the unregistered alcohol market operates has been strengthened by changing social norms and by a political crisis that prevents the creation of investigative and oversight bodies to effect legal compliance. Furthermore, there is little impetus for local governments to investigate illegal alcohol production since the bulk of municipal government income comes directly from the federal budget. Producers weigh the cost of legal alcohol compliance versus the cost of illegal production and conclude that tax evasion is viable because of the scant likelihood of being audited. Legislative efforts to change the supervisory and taxation trends of activities such as alcohol sales have been very specific and sometimes ineffective. At the end of 2007 the Tax Coordination Law was amended to allow states to levy a 4.5% tax on the sale of wines and spirits, but few states have moved to establish this power.

It is well known that the noncommercial alcohol market contains fermented and distilled beverages that emulate popular commercial products, such as tequila and mezcal, by using labels that deceive the consumer. The volume of unregistered beverages consumed could be reduced if authorities eradicated deceptive labeling practices and enforced restrictions on illegal beverage production.

Although consumers in Mexico believe that the quality of noncommercial alcohol approximates that of registered alcohol, chemical analysis in this study revealed that 10% of noncommercial samples did not meet national safety standards. Government communication on the safety of noncommercial alcohol is limited and could be strengthened to raise consumer awareness of the hazards of consumption.

References

Gordillo, J. (2011). *Noncommercial alcohol in Mexico: A case study from Amatitán*. Washington, DC: International Center for Alcohol Policies. Retrieved from http://www.global-actions.org/LinkClick.aspx?fileticket=dHCmyQOy9vw%3d&tabid=294

Instituto Nacional de Salud Pública. (2008). *Encuesta Nacional de Adicciones 2008.* Mexico City: Author.

Medina-Mora, M. E., Robles, R., Gordillo, J. M., & Villatoro, J. (2011). *Estimaciones de consumo de alcohol no regulado en México: Implicaciones para una política pública integral.* Mexico City: Instituto Nacional de Psiquiatría.

Molinar Palma, P. (2003). Valle de Chalco Solidaridad: reflexiones sobre las nuevas formas de asentamientos urbanos. *Clío, Nueva Época*, *2*(29), 103–118.

Russia

Summary of research from Moscow, Kaluga, and Yaroslavl Oblasts

A. V. Volkov
Yaroslavl Oblast Substance Abuse Clinic[1]

V. N. Kholdin
Klin Substance Abuse Clinic

I. A. Gorbatchev
Kaluga Oblast Substance Abuse Clinic

M. A. Zinovjeva
Yaroslavl Oblast Substance Abuse Clinic

B. P. Tselinskiy, V. V. Rozhanets, K. V. Vyshinsky, and A. J. Kolgashkin
National Research Center on Addictions, Moscow

Noncommercial alcohol beverages, which are untaxed and unrecorded, account for a significant portion of all alcohol beverages consumed in Russia, particularly in small towns and rural areas. There is limited information on the production, quality, and patterns of consumption of such beverages, and consequently it is very difficult to propose and implement effective measures to counter noncommercial alcohol consumption. The present study analyzes the situation in three regions of Central Russia: Moscow, Kaluga, and Yaroslavl Oblasts.

Context

In 1914, in response to brewing social unrest, the government of the Russian Empire banned the sale of distilled beverages. However, the population began to consume alcohol surrogates (intoxicating substances not meant for drinking), and home production of distilled spirits, broadly referred to as *samogon* (moonshine), flourished.

From the first years of its existence, the Soviet government paid a great deal of attention to eradicating alcohol misuse. The December 19, 1919, resolution of the Council of People's Commissars (CPC), *On the Interdiction on the Territory of the RSFSR of the Manufacture and Sale of Alcohol, Hard Alcoholic Beverages*, stipulated penalties for making, selling, and purchasing *samogon*. However, despite the measures taken, *samogon* remained the most widespread alcohol beverage in a country devastated by civil war. As a result, in 1924 the government introduced a monopoly for the production of alcohol beverages, and the sale of vodka with 40% alcohol by volume was expanded. In 1927 the government introduced a system of measures to combat alcohol misuse, including a ban on the sale of alcohol beverages to minors and intoxicated persons. Public organizations became active in local committees to fight harmful drinking.

In the post–World War II period, the problem of alcohol misuse became particularly acute and exacerbated the plight of the country. Internal affairs agencies and the relevant departments of health were tasked with controlling alcoholism. Medical departments of sobriety, drug abuse offices, and treatment centers were organized. Administrative law established liability for intoxication and appearing in a drunken state in public places and institutions, as well as criminal liability for involving minors in drunkenness. In 1972, the criminal penalty for the manufacture, sale, and possession of informally produced spirits was increased. Mandatory treatment and occupational re-education of alcohol-dependent individuals in occupational therapy rehabilitation centers were also introduced. Measures aimed at improving the effectiveness of disciplinary, administrative, and criminal penalties for violations related to drunkenness and alcoholism were established.

About half of all respondents receiving treatment in a substance abuse clinic were consumers of *samogon* and alcohol surrogates in addition to commercial alcohol.

1 Author affiliation included for purposes of information only.

The last time an attempt was made to introduce a system of strict administrative bans on the consumption of alcohol in Russia was in 1985. Strictly speaking, these measures were not a "dry law." Many distilleries were dismantled, unique vineyards were destroyed, and restrictions were introduced on the time and the amount of alcohol that could be sold, but there was not a complete ban on trade in alcohol beverages. The measures sharply reduced state budget revenues and the popularity of perestroika but had a questionable impact on public health. The reduction in the consumption of commercially produced beverages was made up for by the consumption of *samogon* and alcohol surrogates, containing ethanol (e.g., industrial alcohol, cologne, and medicinal products). At the end of the 1980s, the restrictions had to be lifted.

In the 1990s, a large quantity of low-grade distilled beverages, including substandard and low-quality counterfeit products packaged as legitimate commercial products, appeared on the Russian market, which overflowed with domestic and foreign pseudo-vodkas, *samogon*, and other alcohol. As a result of this market change and the difficult economic and social transitions of the decade, the problem of alcohol dependence became even more acute. More than 2.5 million people were registered in medical and preventive treatment facilities, but the actual number of patients with alcoholism was significantly higher—about 10 million, or approximately 7% of the country's total population. According to some estimates, approximately 30,000 people, most of them consumers of alcohol surrogates, died of alcohol poisoning each year during the 1990s.

The adverse situation of the spread of informally produced alcohol necessitated the adoption in 1995 of Federal Law No. 171-FZ, *On State Regulation of the Production and Circulation of Ethyl Alcohol, Alcohol and Alcohol-Containing Products*, which remains in effect in Russia. In addition to restricting when, where, and how licensed alcohol products can be sold, the law prohibits the use of ethanol from nonfood raw materials in beverage alcohol production.

A law in effect since 2001 allows the home production of alcohol for personal consumption but maintains a ban on the sale of home-produced alcohol. The Code of Administrative Offenses of the Russian Federation (KoAP RF) provides liability for the production and sale of ethyl alcohol, alcohol, or alcohol-containing products that do not meet the requirements of state standards, sanitary rules, and hygienic norms. Individuals who violate the law are subject to an administrative fine of RUB 4,000 to 5,000 rubles (USD $125 to $155) and confiscation of illicit alcohol products and the equipment used in production; legal entities face a fine of 100,000 to 200,000 rubles ($3,100 to $6,200) as well as confiscation of products and equipment. Similar penalties are imposed on a number of other offenses, including supply or retail sale of alcohol products without proper shipping documents and customs forms, sale of products in containers that do not meet statutory requirements, and industrial production of ethyl alcohol in excess of the legal quota. The KoAP RF also imposes penalties for failing to declare the volume of alcohol products produced or sold and for knowingly providing false information on official declarations.

A law passed in 2007 establishes liability for the production, distribution, or sale of goods and services that do not meet standards for consumer safety. It also establishes liability for improper issuance or use of an official document certifying that goods and services comply with safety requirements. Products containing alcohol are covered under this legal standard. In addition to federal legislation, local laws in many jurisdictions of the Russian Federation regulate the alcohol market by limiting the hours and places in which alcohol may be sold.

Study methodology

The study's primary objective was to assess how noncommercial alcohol is produced, distributed, and consumed in three Russian oblasts. We also sought to understand the population's attitudes toward the noncommercial alcohol market and to describe the chemical composition of noncommercial beverages.

For the purposes of this study, the noncommercial alcohol market was divided into four segments: legal but undocumented alcohol produced and distributed from home (aimed

for own use), illegal alcohol produced and distributed from home, illegal alcohol produced and distributed on a large scale (e.g., counterfeit beverages), and surrogate (nonbeverage) alcohol.

To assess the nature and scale of unrecorded alcohol production and consumption in each oblast studied, and to help clarify the relationship between alcohol policy and alcohol consumption trends, we surveyed and interviewed three sample groups.

- Of 157 high-risk consumers, 82 were undergoing treatment in a substance abuse clinic and 75 people were noncommercial alcohol consumers but were not seeking treatment.
- Key informants surveyed included 45 law enforcement officers, 35 healthcare workers, and 38 teachers.
- The general population was represented by 619 respondents.

In addition, 25 noncommercial alcohol producers were interviewed.

The study was conducted in three sites: the city of Klin and its surrounding area, in Moscow Oblast, which has a relatively favorable economic situation because many of its inhabitants work in the capital; the city of Yaroslavl, one of the oldest industrial centers in the country and now a middle-income area, and Yaroslavl Oblast; and the city of Kaluga and Kaluga Oblast, which have relatively successful developed industry, including in the high-tech sector.

The first stage of the research involved an analysis of contextual issues, including background information on noncommercial alcohol consumption and relevant legislation, and preparation for conducting the study, including recruitment and training of interviewers. The second stage involved the collection, organization, and analysis of survey data, as well as chemical analysis of alcohol beverage samples. In the third stage a final report on the study's findings was prepared.

Survey results

Producers

The 25 producers interviewed included men and women, over half of whom were aged 60 or older. Most producers rated their financial situation as average or below and indicated that they produce and sell alcohol primarily because it is a source of income.

All producers surveyed were small-scale manufacturers who operate and sell from home and sometimes through relatives and acquaintances. Most produce 5 to 40 liters per month of *samogon*, which is usually made by double distillation. Some also produce moderate quantities of homebrew and homemade wine through fermentation in barrels. The producers themselves, their relatives, and their friends regularly consume these products.

High-risk consumers

Among high-risk consumers being treated in substance abuse clinics, the vast majority had secondary specialized and secondary education. Those not currently undergoing treatment tended to have a higher education level and professional status.

Consumers in both subgroups preferred vodka, beer, and mixed drinks and mostly consumed these beverages during their last drinking episode. About half of all respondents receiving treatment drank *samogon* and alcohol surrogates in addition to commercial alcohol. Compared to consumers in treatment, high-risk consumers not being treated reported higher average monthly expenditures on alcohol—up to 2.8 times more in Kaluga Oblast.

Noncommercial alcohol consumers across all regions studied cited the low cost of the beverages and the desire to "enjoy company" as motives for consumption. All high-risk consumers reported that the main reason for drinking any alcohol is to reduce emotional stress. They realized, however, that drinking can lead to many physical and mental health problems as well as problems in one's professional, public, and private life. Consumers undergoing treatment were more likely to report that they have already experienced such problems. Almost all 24 respondents in Klin who are not being

treated denied experiencing harmful outcomes from drinking.

Key informants

Law enforcement officers, doctors, and teachers who were interviewed generally agreed on the issues related to noncommercial alcohol production, sale, and consumption. There were some notable differences, however, by region and profession.

In Yaroslavl Oblast, doctors and police officers were found to be less informed than teachers about the regulations on noncommercial alcohol. They also first pointed to members of national diasporas when asked to identify the producers of noncommercial alcohol. Doctors highlighted the role played by pharmacological companies in noncommercial alcohol production. Doctors and teachers in the region commented that many consumers may not know that the some of the products they buy are noncommercial.

In Kaluga Oblast, half of the surveyed doctors and teachers were not fully aware of the current legal restrictions in the region on the production and consumption of noncommercial alcohol. Most law enforcement personnel reported that the issue has not caused difficulties and that half of the local population is not concerned about noncommercial alcohol. However, the vast majority of doctors and teachers believed that the local population is adversely disposed to the production and consumption of noncommercial alcoholic beverages.

Key informants strongly agreed that promoting a healthy lifestyle and improving the culture of alcohol consumption were important measures to reduce harm from noncommercial alcohol. Some also noted that laws and enforcement should be stricter to reduce consumption.

General population

The anonymous survey of the active working population in the studied regions indicated that spirits, dry wines or champagne, and beer are the preferred alcohol beverages. *Samogon* is consumed by a significant minority of those surveyed: 7.6% in Yaroslavl, 24% in Klin, and 35.4% in Kaluga. Less than 10% of the population in all study sites reported consumption of surrogate alcohol.

Many respondents have encountered counterfeit beverages. They reported that vodka was the beverage most likely to be counterfeited, followed by wine and beer. They believe that counterfeit alcohol beverages are produced mainly in underground shops.

The vast majority of respondents (82%–91%) were aware that noncommercial beverages are dangerous to health but report that people consume such products because they are inexpensive and available at any time of day. Over two-thirds of respondents prefer to buy legal alcohol in stores when possible.

Respondents most often drink at home, as guests outside the home, and at cafés and bars. Up to 20% of respondents drink unlawfully on the street or on public transportation. In Kaluga Oblast, 21.4% of respondents reported drinking alone.

According to respondents in all regions studied, the most common effect of alcohol consumption is a feeling of relaxation. Respondents are aware of the health and social consequences of harmful drinking. Over 30% of those surveyed reported having had family disputes as a result of drinking.

Chemical analysis

Chemical analysis was performed on 56 samples of illicit alcohol collected from the three study sites. The beverages included 21 *samogon* samples, 19 illegally sold vodkas, 7 rectified spirits (including 2 labeled pharmaceutical tinctures not containing any active substance), 4 fortified wines, 3 brandies and whiskeys, and 2 samples of *braga* (fermented raw materials for moonshine). The samples were analyzed for ethanol content and the content of toxic substances including acetaldehyde, fusel alcohols (1-propanol, 2-propanol, isobutyl alcohol, 1-butanol, and isoamyl alcohol), esters, methanol, heavy metals, minor organic compounds. Results by beverage type are presented below.

- The 21 investigated samples of *samogon* were found to contain ethanol, fusel oil, ester, and methanol content similar to average samples of *samogon* collected

from 2004 to 2011 in various regions of Russia and Ukraine. In two-thirds of the samples gas chromatography–mass spectrometry revealed the presence of supplements to improve the organoleptic properties of *samogon*, including phenylethanol and other minor organic compounds. In general, we conclude that the acute toxicity of these distillates does not exceed the toxicity of commercially produced spirits.

- Approximately 80% of the samples of illegally sold vodka were in full compliance with the requirements of the national standard for vodka of the highest quality (GOST R 51355-99). Four samples contained elevated content of acetaldehyde, fusel oils, or esters, in concentrations characteristic of *samogon*. Most of these beverages were made from nonbeverage rectified alcohol containing diethylphthalate as a denaturing additive.
- Samples of rectified spirits, including counterfeit pharmaceutical tinctures, met the ethanol and toxicity standards for alcohol from raw food materials of the highest quality (GOST R 51652-2000). Most of the samples were of nonbeverage rectified alcohol containing a concentration of the denaturing additive diethylphthalate, which did not affect the toxicity.
- The fortified wine samples were similar to the *samogon* samples in acetaldehyde content. Their ethanol content was similar to that of commercially produced fortified wines.
- The toxicity of samples of other illegal spirits (e.g., brandies and whiskeys) was similar to that of the *samogon* and vodka samples.
- When adjusted for ethanol content, the *braga* samples contained levels of acetaldehyde and higher alcohols four times higher than those of the *samogon* samples. Chronic consumption of alcohol beverages with elevated levels of acetaldehyde is regarded as a risk factor for the development of cancer and hereditary diseases.
- Selective analysis of the heavy metal content in 23 samples did not show concentrations of copper, cadmium, zinc, or lead in excess of the national standard for drinking water (GOST R 52180-2003).
- About 70% of the samples of illegal beverages contained minor organic compounds not regulated by national standards. These included diethylphthalate, grape juice compounds, the flavor additive phenylethanol, and other compounds that improve the organoleptic properties of beverages.

In general, with the exception of *braga*, the samples analyzed did not exceed the potential acute toxicity of commercially produced distilled and rectified beverages. Nevertheless, given the significant regional differences in production technology for undocumented alcohol beverages, especially *samogon*, further monitoring of their potential toxicity will be an essential component for epidemiological studies.

Sri Lanka

Summary of nationwide research

Uditha Liyanage
Post Graduate Institute of Management Sri Lanka[1]

Kunal Sharma, Mihirani Dissanayake, and Rukshani Nonis
TNS Lanka

Context

At least two-thirds of all alcohol consumed in Sri Lanka is noncommercial. *Kasippu*, an illicit distilled beverage, is much less expensive than legal alcohol beverages and occupies a prominent place in the thriving black market trade.

Sri Lankan policies on alcohol, such as the Mathata Thitha ("full stop to alcohol") program, have focused on reducing consumption of all alcohol. Legally produced alcohol is not widely available in many parts of the country, other than the heavily populated Western Province, and sales are further restricted by national regulations. According to state law, retail outlets must close on the country's many secular and religious holidays, places that sell alcohol cannot be located close to schools and places of worship, and purchasers of alcohol must be at least 21 years of age. High taxes on legal alcohol make it unaffordable for most lower-class consumers.

The high prices and limited availability of legal alcohol have contributed to the high consumer demand for *kasippu*, commonly known to be the cheapest alcohol beverage in the country. Although the production of *kasippu* is illegal, it is widespread because it is profitable and because the legal penalties are inconsistently enforced and not strong enough to deter producers.

The wide availability of noncommercial alcohol in Sri Lanka and its harmful effects on consumers and their dependents have made it an important national issue. To gain a more complete picture of the patterns of consumption and production, a nationwide survey was conducted in 2011. Important findings of this study, and policy implications to reduce harm from noncommercial alcohol, are discussed below.

Description of study

The research involved a quantitative household survey using a structured questionnaire and face-to-face interviews. Three groups were targeted in the survey: consumers, producers, and family members of consumers. Consumers were defined as individuals who are at least 18 years of age and who consume noncommercial alcohol at least four times a week. The producers group included people who produce either large or small quantities of *kasippu*, people who assist in production but do not own the production site, and distributors. The family members group included the spouse, children, siblings, and parents of *kasippu* consumers. Random sampling was carried out to recruit survey respondents, and additional samples of consumers and producers were recruited so the required quota could be met.

80% of consumers surveyed say they would definitely or probably switch to legal alcohol if the price were reduced to that of their usual noncommercial beverage.

1 Author affiliation included for purposes of information only.

Findings

According to respondents across the country, production and consumption of unrecorded alcohol is one of several important social issues. Other issues include high unemployment, migration of household heads and parents due to economic difficulties, and drug addiction among young people. Across the country, many people perceive noncommercial alcohol as an easily available product in their areas.

Consumption

Among 2,408 randomly selected Sri Lankan households of low socioeconomic class, 19% have a member who regularly consumes noncommercial alcohol. A higher incidence of noncommercial alcohol consumption was found in the Eastern Province (49%), followed by the Northern and North Central Provinces.

Of all consumers identified in the national survey, 83% live in rural parts of the country. One possible explanation for this trend is that noncommercial alcohol is more affordable than legal alcohol to people in rural areas, who generally do not have much disposable income. Another reason is that noncommercial alcohol production is more prevalent in rural Sri Lanka.

Consumers of noncommercial beverages are mostly males aged 40 to 60 years old from families of the lowest socioeconomic class. Their average monthly household income is about LKR 17,125 rupees (USD $150), of which about half is spent on food and an average of 14% is spent on *kasippu*.

According to consumers, many of whom are manual laborers or farmers, one of the main reasons for drinking is to overcome exhaustion and body aches after hard physical work. For many of these consumers, drinking may also be a matter of habit or dependence. Other reasons cited for drinking include to have fun, to fit in among peers, to escape the pressures of life, and to reduce loneliness.

Consumers favor *kasippu* over legal arrack (a distilled beverage made from fermented coconut flower sap) because of its low price and easy availability. A 750 ml bottle of *kasippu* costs 200 to 300 rupees ($1.75–$2.65), while the same quantity of legal arrack costs 560 to 700 rupees ($5.00–$6.20). Consumers interviewed in a pilot survey stated that if they were to buy legal alcohol, then they would not have money to purchase snacks or cigarettes. Consumers also perceive that noncommercial alcohol is stronger tasting than legal alcohol, can be drunk without a shandy (diluting beverage), and is an economical product that does not

A secluded illicit alcohol distillery in the jungle.

need to be consumed in large volumes for intoxication.

Because of noncommercial alcohol's affordability and other perceived advantages, the majority of consumers are more likely to shop for their regular drink in another location if they cannot find it at the usual selling place than they are to purchase a legal alternative such as arrack, beer, or toddy (fermented coconut flower sap). However, 80% of consumers say they would definitely or probably switch to legal alcohol if the price were reduced to that of their usual noncommercial beverage. Younger consumers are especially likely to consider buying a low-priced legal alternative. Many of those who claim they would never shift to a low-priced legal beverage stated that it is very difficult to change their regular beverage because they are used to the taste of the product and they have had bad experiences consuming legal alcohol.

Although most consumers stated they would shift to legal alcohol if it were less expensive, this does not mean that they would definitely stop consuming noncommercial alcohol. Even if inexpensive legal alcohol were introduced, there are many consumers who would likely still opt for *kasippu* because they are familiar with its taste and strength or because they are physically dependent on it.

Among regular *kasippu* consumers, 77% sometimes or often drink alone, typically at the point of sale. Twenty-six percent of consumers sometimes or often meet other drinkers at the point of sale, and 35% meet a group of friends with whom they drink regularly. Most regular consumers drink in the evening to relax and to reduce physical pain and stress.

One-third of the national consumer sample reported drinking daily. Although noncommercial alcohol consumption is more prevalent in rural pockets of the country, consumers in urban areas tend to drink more often, with 56% drinking daily. Among all consumers, married men of very low socioeconomic class are more likely to drink daily, as are men over age 50.

An average of 443 ml of *kasippu* is drunk by a typical consumer in a day, for which they spend about 177 rupees ($1.35) or less. Gulping down a shot or glass of alcohol without mixing in a nonalcoholic beverage is a common practice among daily consumers of *kasippu*. The majority of consumers who eat a snack with the alcohol do so while drinking, while others eat just after drinking. Most consumers purchase noncommercial alcohol in plastic bags and pay in cash.

Production

The prevalence of production and transportation of noncommercial alcohol varies across Sri Lanka but is greater in rural areas such as Puttalam. *Kasippu* produced in rural areas is regularly transported into urban areas such as Colombo.

Even though the production sites may occasionally be raided, producers often use bribes or connections with police and politicians to escape penalty. Furthermore, the current legal policies are not strong enough to deter manufacturing and selling noncommercial alcohol. The fines imposed for production are relatively weak: 5,000 rupees ($40) for the first bottle and 1,000 rupees for each additional bottle. Many of the 47 producers interviewed stated they have been caught in the act of production at least once but have not had to limit their operations.

Producers are mostly from the lower socioeconomic strata of society, are uneducated, and cannot easily find other sources of income. Noncommercial alcohol production is profitable and relatively easy to engage in on at least a small scale. However, 93% of producers say they would be willing to cease production and earn their livelihood from legal self-employment, such as through agriculture, if given an opportunity.

The main ingredients in *kasippu* are sugar, yeast, and water. Most survey respondents believe that the production environment of noncommercial alcohol is very poor and that the beverages are harmful for consumption. Many believe that low-quality water is used and that dangerous substances such as ammonia, urea, or barbed wire are added to speed up fermentation or make the product stronger. There have also been reports that insects or other small animals are added to the fermentation barrels deliberately or that they fall in because they are drawn to the sweet smell.

Copper coils attached to the barrels for cooling.

Chemical analysis

In a chemical analysis of 23 samples collected from all nine provinces of the country, the average ethanol content was 26% by volume, with most samples within the range of 22%–38%. Although all samples were found to be free of methanol, many samples contained traces of other harmful substances, including nitrates (an average of 0.62 mg/l) and zinc (an average of 0.37 mg/l). Dangerously elevated levels of copper (an average of 8.21 mg/l) were found in most samples. One sample contained traces of lead (0.2 mg/l).

Selling

Small- and medium-scale producers typically sell their products themselves or with the help of family members. Private houses are typical selling points in urban areas such as Colombo, while hidden places such as jungles are common in rural areas. To avoid being caught by the police, sellers tend to change their selling points from time to time.

Large-scale producers often use women as sellers. The reason stated for this was that women in these communities tend to have husbands who misuse alcohol and do not support their families financially. The wives in many families take the lead in earning an income to meet their families' basic needs, which may involve selling *kasippu*. Other times, women sell alcohol to earn income after the death of a husband. A further reason expressed by respondents is that women are less likely to be suspected of selling noncommercial alcohol and thus less likely to be caught by authorities. These women are often vulnerable and exploited. Many female sellers operate from their home.

Consequences of noncommercial alcohol consumption

Noncommercial alcohol impacts the physical, emotional, and financial health of consumers as well as that of their dependents. Since *kasippu* is not subject to formal quality controls and often produced in unsanitary conditions, it may contain contaminants that cause immediate and lasting harm to consumers. Long-term heavy drinkers are prone to serious health consequences including mental disorders and damage to the liver, stomach, lungs, and kidneys.

As a result of their drinking, consumers often face problems at home, at work, and in the community. Among family members of consumers, 57% reported that drinking has led to family conflicts or domestic violence and 51% reported that drinking has made the family poorer.

Dependents of noncommercial alcohol consumers are affected economically as well as emotionally by the drinker's behavior. According to the national survey, 38% of the general community perceive that areas that are home to consumers are very unsafe for women and children, and 39% believe *kasippu* can contribute to the incidence of child abuse.

Many women migrate abroad in search of employment and also in some instances to get away from drunk and abusive husbands. The children of these individuals are then raised by an abusive father or by elderly grandparents and often lack proper guidance. Many of these children grow up in an atmosphere where alcohol is the solution to all problems, and thus they too become heavy consumers. Families with noncommercial alcohol consumers are marginalized and treated as disturbances by the larger society.

Hospitals are the main place where people seek help to overcome dependence on informal alcohol. The survey results show there are not many rehabilitation centers for *kasippu* drinkers except a few run by the government. Some people seek help from community leaders when they have an issue involving *kasippu* consumption in their house or community.

Conclusions and recommendations

It is evident that the eradication of *kasippu* will require a multi-pronged approach focusing on the economic, environmental, attitudinal, and legal aspects of the current scenario.

Despite several policy measures to prohibit production of noncommercial alcohol, large-scale production and transportation continues to take place. Producers are aware of many loopholes in the legal system that make these laws and regulations less effective. They also use their connections with police and politicians to escape penalty. It is thus of utmost importance that the policies and regulations be changed so producers cannot escape punishment so easily. It is especially important to free the authorities who deal with *kasippu* producers from being unnecessarily influenced by politicians.

At the macro level, unemployment and lack of disposable income for legal alcohol are the main factors behind *kasippu* consumption in many rural communities. The majority of people surveyed recognize the importance of self-employment programs, whether run by the government or another body in the community, in the ability to earn a living. Therefore, by improving the standard of living of many rural Sri Lankans, self-employment programs, particularly those related to agriculture, could help reduce *kasippu* consumption.

Another important factor in breaking the cycle of *kasippu* consumption is changing people's attitudes toward such noncommercial products. Consumption of noncommercial alcohol is not seen as improper among people in the lower social strata. Bringing about a fundamental change in attitude will be a difficult long-term strategy but will be important in discouraging *kasippu* consumption. The best way in which to change these attitudes is to begin with the younger generation. Education programs should include lessons on not only the health and social consequences of drinking informal alcohol but also the legal consequences. Sessions could be led at schools by authoritative figures to educate children on the impact of consuming *kasippu*.

Another possible strategy to develop local-based solutions to reduce the noncommercial alcohol market is to conduct workshops with community leaders on the alcohol situation in their area. The best practices from these workshops could be shared with other organizations in Sri Lanka.

Because one main driver of the high demand for informal alcohol is relative affordability, it is possible that introducing legal alcohol at a more affordable price would help reduce consumption of informal products. Furthermore, it is easier to control and regulate the market for legal products. However, it is possible that making legal alcohol more affordable will increase consumption among current drinkers and lead some abstainers to become drinkers.

Although noncommercial alcohol is prevalent in Sri Lanka, it can be reduced with the proper interventions by government and relevant organizations to limit production and discourage consumption. It would be useful to gain more information on how the solutions proposed above could be implemented.

Collecting the distilled alcohol.