

# Mercury Use and Exposure among Santeria Practitioners: Religious versus Folk Practice in Northern New Jersey, USA

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**Objective.** *To understand and characterize exposure to and use of elemental mercury among practitioners of Afro-Cuban religions in Hudson County, New Jersey, USA.*

**Design.** *Participant observation and open-ended interviews with 22 religious supply store employees and practitioners of Santeria, Espiritismo or Palo Mayombe probed respondents' knowledge and use of mercury, as well as their beliefs about its benefits and risks. Including a cultural and religious insider as part of the research team was crucial in working with this relatively closed community.*

**Results.** *Seventeen of the 21 practitioners reported using mercury or mercury compounds in various forms of practice and in services that they provide to clients. The contained nature of these uses suggests that accidental spills, as opposed to the practices themselves, emerge as the greatest exposure concern for this population. Mercury was never recommended to clients for individual use. This restriction appears to be rooted in the way the religion is practiced and in the way santeros receive compensation, not in a perception of mercury as hazardous. Most practitioners were aware that mercury can be hazardous, but were not familiar with the most significant exposure pathway, inhalation of mercury vapor. A climate of fear surrounds the use of mercury in this community, so that health concerns pale in comparison to fear of reprisal from authorities. Among those who sell or formerly sold mercury, several shared the erroneous belief that it was illegal to sell mercury in New Jersey.*

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**Conclusion.** *Despite widespread reported use, there were no reports of practices believed to result in the highest exposures. To reduce exposure in the community, interventions presenting general information on mercury hazards and instructions for cleaning up spills are recommended. To address insider–outsider dynamics and the climate of fear, educational materials should be accessible to the community and avoid any mention of religious practice.*

*Keywords: Mercury; Santeria; Participant Observation*

## **Introduction**

Hispanics or Latinos are the fastest growing minority group in the USA. These pan-ethnic labels hide an incredible heterogeneity, including both native and foreign-born individuals, as well as those with origins in North and South America and the Caribbean (Oboler 1995; Rodriguez 2000). To a certain extent, these labels promote the idea of a single culture, and neglect the different ideas, belief systems and behaviors of this diverse group. Recognizing difference becomes especially significant as we consider the ways in which culturally specific practices potentially affect the health of group members.

In this paper we explore one topic located at this difficult intersection of continuing health disparities and respect for others' belief systems—the connection between the use of elemental mercury in Latino religious (Santeria and Palo Mayombe) and folk traditions, and the potential for high levels of exposure to toxic mercury vapors. While there is increasing evidence concerning the use of mercury in this community, little information exists on the possible differences in practices involving mercury, which determine the magnitude of exposure.

In the USA, the use of elemental mercury (also called *azogue* in Spanish) in Latino and Caribbean religious and folk traditions has come to the attention of environmental and health regulators (EPA and ATSDR 2003). Mercury released in confined spaces volatilizes at room temperature, exposing occupants to mercury vapor (Mortensen *et al.* 1990; Taueg *et al.* 1991; Malecki & Hopkins 1995; Carpi & Chen 2001; Cherry *et al.* 2002; Michigan DCH and ATSDR 2002; Zeitz *et al.* 2002). Because of mercury's long residence time indoors, such exposure can result in neurological effects including intention tremors, emotional lability, polyneuropathy and deterioration of cognitive function (ATSDR 1999).

Mercury's availability in Latino and Caribbean communities in the USA has been documented through a number of studies (Wendroff 1990; Zayas & Ozuah 1996; Chicago Department of Public Health 1997; Johnson 1999). Mercury is commonly sold in botánicas (religious supply stores), packaged in gelatin capsules containing approximately nine grams of mercury (Wendroff 1990). Reported uses include sprinkling droplets on floors or in cars, carrying it in an amulet in a pouch, placing it in a candle, or mixing it with perfume, lotions, bathwater or soap and water for spiritual cleansing of a dwelling (Wendroff 1990; Zayas & Ozuah 1996;

Johnson 1999; JSI Center for Environmental Health Studies 2003). Riley *et al.* (2001) estimated that exposures from sprinkling activities with 1-mm diameter droplets could produce indoor mercury vapor concentrations around  $7 \mu\text{g}/\text{m}^3$  in a  $40 \text{ m}^3$  (an area of about 150 square feet) living room with an air exchange rate of 0.5 changes per hour. This concentration is below the US National Institute of Occupational Safety and Health's (2000) eight-hour time weighted average (TWA) recommended exposure limit of  $50 \mu\text{g}/\text{m}^3$ , but an order of magnitude above the 'minimal risk level' set by the Agency for Toxic Substances and Disease Registry (ATSDR) of  $0.2 \mu\text{g}/\text{m}^3$ .

Clinical exposure data related to Latino and Caribbean cultural practices are sparse. Forman *et al.* (2000) reported exposure of nine children and their mother to mercury vapor. The children played with mercury they took from a neighbor, who 'reportedly operated a business preparing mercury-filled amulets for practitioners of the Afro-Cuban religion Santeria'. Mercury poisoning has also been documented in Mexican-American infants in Los Angeles who were fed mercury as a folk remedy for gastroenteritis (Geffner & Sandler 1980). Ozuah *et al.* (2000) found a 3% prevalence rate of elevated mercury levels ( $>10 \text{ mg}/\text{l}$ ) in urine of 100 children in the Bronx, New York. The sources of their exposure were not investigated.

The possibility of high mercury vapor exposure levels, combined with its reported usage in Santeria and other Afro-Cuban religions (Wendroff 1990; Peyser 1991; Chicago Department of Public Health 1997; *Focus* 1998), has led researchers and public health officials to focus on these religions for potential intervention. Much anecdotal information is available, but no specific linkages between Afro-Cuban religions and practices that would result in high exposures (e.g. sprinkling mercury in a home, workplace or car) have yet been presented. Thus, this study seeks to explore those uses that might result in elevated mercury exposure to individuals, and to understand cultural practices and beliefs that underlie mercury use in this group. Using information obtained from fieldwork and interviews in the Afro-Cuban religious community in northern New Jersey, we examine the various types of mercury use and their potential health hazards.

We begin with a basic description of two of the most widely practiced Afro-Cuban religions, Santeria and Palo Mayombe, and an attempt to characterize their practitioners. This is necessary not only in order to understand the role of mercury in religious practice but also in order to develop a better idea of the population at risk of exposure. We then present a description of our methodology, including a discussion of the potential benefits and concerns about having a religious insider (practicing santero) on the research team. We also elaborate on some of the difficulties for conducting fieldwork in a closed community.

Our findings section details the ways in which Santeria practitioners use and do not use mercury in religious rituals, and their impacts on exposure to mercury vapor. We conclude with a discussion of the possible roots of different types of mercury use as well as respondents' knowledge of the health hazards of mercury.

Finally, recommendations are given regarding research and outreach programs within the Afro-Cuban religious community as well as for mercury education in general.

### **Afro-Cuban Religions**

The Santeria and Palo Mayombe religions developed in Cuba due to suppression of African religions practiced by slaves brought to the Caribbean. These religions combine beliefs of African peoples from Southern Nigeria, Senegal and the Guinea Coast with elements of Roman Catholicism and French Spiritism (Lefever 1996). It is commonly said that Santeria syncretizes the beliefs of the Yoruba people with Catholicism and Spiritism, while Palo represents the beliefs and practices of the Bantu people from the Congo region. Connecting each of the seven Yoruban deities or *Orishas* with specific Christian saints enabled the slaves to keep their traditions alive and led to the birth of Santeria. Practice in Palo is focused on the *prenda*, a consecrated pot containing a number of natural items having spiritual significance, including mercury.

Santeria and Palo are commonly practiced in homes and do not have specific temples. They also lack the type of formal hierarchy found in most Western religions. Despite a recent proliferation of books on Santeria, knowledge has historically been transmitted orally. These religions have maintained their integrity through secrecy and a strict control of information. According to scholar and santero Raul Canizares (1999):

... the majority of Cuban santeros still adhere to the long-standing customs of not talking candidly to outsiders, of cloaking their faith with Catholic trappings. Traditionally, even family members did not know that their own relatives were active in Santeria. (p. 26)

Upon arriving in the USA, the necessity of keeping the religion secret took on a new meaning. Not only did the immigrants have the usual difficulty with authorities but they also found that myths about their beliefs were widespread in mainstream culture. For example, the 1987 horror movie, *The Believers*, focuses on supposed Santeria involvement in human sacrifice. In addition there were explicit attempts to suppress certain aspects of Santeria practice such as animal sacrifice (*Church of Lukumi v. Hialeah* 1993).

Santeria and Palo also play important roles in folk health beliefs and practices (Pasquali 1994). Since good health is seen as part of a larger mind, body, spirit balance, the cause of illness may be seen as a negative supernatural force. Santeros may be called upon to remedy the imbalance which would thus restore one's good health (Pasquali 1994). Interestingly, mercury—with its own deleterious health effects—may be used in rituals to restore balance and thus cure illness.

To study adherents of Santeria or Palo, one must first understand what the term 'religious practitioner' means to those within the religion. A working definition

of practitioner is absent from the literature on mercury use. Some authors (Wendroff 1990; Chicago Department of Public Health 1997) appear to have combined various practices under one 'pan-religious' label of Santeria which is used to describe a variety of Afro-Caribbean religious and folk traditions. Although not necessarily easily discerned by the outsider, many practices that are not part of traditional Santeria have been placed under that label. Important differences between the practices are thus ignored.

Outside the religious community, people also tend to define any individual who has used the services of a santero, botánica, etc. as a religious practitioner. This leads to the development of exclusive categories to describe religious practice. In reality, practitioner and non-practitioner are not necessarily discrete categories, but rather a continuum representing increasing involvement in the religion. The mistaken division of adherents of Afro-Cuban religions into discontinuous, mutually exclusive groups leads to a potential misunderstanding of the at-risk population.

Fieldwork has shown that insider and outsider definitions of practitioner may differ substantially. Although someone may not be an initiated santero/a, he or she may self-identify as a practitioner, and may engage (with varying levels of frequency) in religious rituals (Newby & Dowling 2002). It is essential that outsiders recognize that there are various 'levels' of commitment to the religion. Additional confusion comes from the fact that all believers in Santeria are, many times, referred to as 'santeros', regardless of the level of initiation. Despite the flexibility of terms within the community, in this paper we will use the term santero/a to refer to an individual with 'santo hecho', or one who has been initiated as a Santeria priest by receiving a saint which has been symbolically placed within one's head. According to Canizares, 'involvement in Santeria follows a carefully developed hierarchical structure, which must be understood to discuss the religion in any depth' (p. 28). He breaks participation down into the following groups ranging from least to most involved: interested observers, occasional clients, habitual clients, amulet recipients, Elegua Initiates, Guerreros Initiates, Collares Initiates, santeros and babalaos.

In this paper we refer to three basic categories of individuals based on knowledge of rituals involving mercury. We collapsed the categories of occasional clients through Collares Initiates into the category of practitioner. Although this category includes quite a bit of heterogeneity, the most important distinction is between this group of practitioners and those who have been *initiated* as priests or santeros. The initiation process involves gaining specialized knowledge of specific rituals and religious secrets. Thus, santeros can perform rituals involving mercury and make up our second category. The third category consists of babalaos who are considered the high priests of the Santeria religion and who can also use mercury in religious rituals. Traditionally, babalaos have been initiated as santeros, before becoming babalaos. It is also important to note that babalaos and santeros have overlapping yet distinct roles in religious practice and perform different rituals.

In addition to varying levels of religious commitment, the oral tradition and lack of formal hierarchy within the larger Santeria community have created variations of religious practice across time and space. Santeria and Palo also continue to evolve as practitioners adapt to new environments. This diversity within religious practice is further complicated by the cultural diversity of practitioners. Despite the popular misconception that Santeria and Palo are solely 'black' religions, US santeros may be from diverse Latin American backgrounds, as well as African American and Anglo American. Newcomers who enter the religion as adults bring their own belief system and cultural heritage with them, many times incorporating these beliefs into their religious practice.

### Study Methods

Our study focuses on mercury use by Latinos in northern New Jersey, selected for apparent level of commitment to Santeria. The area was chosen based on the high concentration of Hispanic population in Hudson County (over 70% Hispanic in the research area). Previous work in the area had discovered a number of botánicas catering to the Latino religious community, many of which had been found to sell mercury (Riley *et al.* 2001).

Our fieldwork included formal structured but open-ended, in-depth interviews, and participant observation in these communities. Preliminary work began in spring 2000 with interviews conducted in November and December 2001. In the social and political context in which the research was conducted, signing a written form carries a high level of perceived risk for the participants, thus, verbal informed consent was received. Verbal informed consent is acceptable in accordance with the Code of Ethics of the American Anthropological Association. Because of respondents' discomfort with taped interviews, written notes were taken. All interviews were conducted in Spanish, and interviews and field notes were later translated into English. All interviews were assigned numbers and respondents are referred to by pseudonym to assure anonymity. Our snowball sample was located through community contacts and the informal social networks of previous interviewees. Through analysis of these interviews, we do not attempt to arrive at statistical generalizations, but to seek a better understanding of the meanings attributed to mercury, the ways in which it is used, and individuals' knowledge of exposure pathways.

The structured interviews consisted of three sections. First we obtained basic demographic and socioeconomic information including age, place of birth, household information and occupation. The second section focused on respondents' religious background and level of participation in Afro-Caribbean practices. The final component asked specifically about knowledge about mercury and mercury use. Questions focused on the following:

- Beliefs about mercury and its purposes in religious vs folk practice.
- Details of practice involving mercury.

- Knowledge of mercury as an environmental hazard and perceived risks of mercury use.

Our field research team was interdisciplinary and consisted of three researchers from diverse methodological orientations and cultural backgrounds: an American engineer and risk analyst, a bilingual sociologist with experience with Latino immigrant populations, and a Cuban-born santero with over 20 years of religious practice.

While participant observation generally increases the likelihood of subjective influence and observer effects, we believe that working with an insider (Afro-Cuban santero) participant observer reduced normative expectations among respondents. This was evident in the respondents' sharing of confidences and willingness to engage in mercury sales. In this case, our research methods allowed us to understand the behavior from the subjects' point of view, rather than imposing an outsider's interpretations (Bulmer 1984). Not only did participant observation provide less biased data than would have been obtained using other methods, but also it allowed us to approach sensitive topics which would not be suitable for more representative methods such as sample surveys, and to gather a richness of information not obtainable through the use of quantitative methods with a larger population.

The subjective perspective of the insider observer was balanced through interactions with the outsider members of the research team. All team members engaged in daily debriefing sessions where we discussed not only our day's work, but also our evolving relationships with community members. All observations, whether individual or at the group level, were recorded in a group field diary. Thus, we were able to identify and discuss insider and outsider perspectives on religious practice in general and mercury use specifically. The santero researcher was also encouraged to reflect on his own role in religious practice, as well as his relationship to other santeros as both a researcher and as a fellow practitioner.

Limitations of our research included time and funding constraints, which allowed us to remain in the field for only a relatively short time. Our work was also conducted in a specific geographic area which may present certain differences when compared to other potential research sites. We were not able to directly observe mercury use in the community, balancing an ethical requirement to ensure the safety of human subjects with an ethical requirement for non-intervention in participant observation. Thus, all data obtained are through self-reports, which retain a narrative quality and represent an individual's experience as he or she understands it. Collectively, individual self-reports combine to create a picture of the community including important contextual information as well as the details of mercury use.

There are a number of barriers to conducting research within the Afro-Cuban religious community. Insider–outsider issues are magnified by the fact that mercury use has become a sensitive topic in the research area. There is a *perception* that mercury is an illegal substance and residents are extremely wary of discussing the ways in which it may be used, out of fear of a 'crackdown' by the authorities. Although denied by the local health department, many respondents claimed that

botánicas were being fined or shut down if it was discovered they had mercury. In other work in this area, Riley *et al.* (2001) found that members of the research team obtained different responses according to whether they were seen as insiders (members of the larger religious community) or outsiders (non-community members) by respondents. In fact, white, non-Hispanic members of the research team had trouble even purchasing mercury. Many respondents in this previous study denied knowing about mercury use in the community, at the same time as they discussed it openly with the santero member of the research team. Historical misrepresentation of Afro-Cuban religions and their practitioners also has made participants reticent to discuss religious issues with non-community members.

In order to address the insider–outsider issues, the Afro-Cuban santero member of the research team conducted all interviews. Community members had expressed cynicism about both the value and the purpose of the research. Several had asked: ‘Why the interest in mercury? Who are you working for?’ or ‘Mercury use is private, but it isn’t dangerous.’ Working with someone of the same ethnic and religious background as the majority of respondents greatly facilitated the research. Respondents appeared to trust that the interviewer, as a group member himself, would treat secret issues with respect and be sensitive about the portrayal of religious practice. Although informants were aware that we were part of a research team, they expressed a higher level of comfort discussing religious issues with the santero researcher. This is due in part to the importance of secrecy in Santería. While a respondent might be willing to discuss mercury in general terms, he or she would be wary of divulging (even inadvertently) information which is available only to initiates. A specific vocabulary in the Lukumi language (a derivative of Yoruba) is also used to discuss many aspects of religious practice and serves as a cue for establishing insider status. It is important to recognize, however, that participation in the study was limited by the networks which could be established by the santero member of the research team.

We conducted informal interviews and participated in several ceremonies with members of the religious community. Although these ceremonies did not involve mercury, our presence was important for strengthening our relationship with the community. Study participants were selected for apparent level of commitment (self-declared) to Santería and willingness to be interviewed. All interviewees were non-initiated practitioners, santeros or babalaos. We focused especially on santeros and babalaos because of their specialized and often exclusive knowledge of complex ritual practices, learned through a lengthy initiation period (traditionally a year in Cuba, sometimes less in the USA).

Initial contact with respondents was established through botánicas or festivities honoring Santa Barbara (also known as the Orisha Changó) on December 4. Upon arriving in northern New Jersey in early December, the research team asked in local botánicas if there were festivities planned for Santa Barbara. Attending these festivities allowed us to establish a presence in the community, and provided a

preliminary contact with potential respondents. We also used this time in the botánicas to begin to ask about mercury and to set up preliminary interviews.

## Findings

In-depth interviews were conducted with 22 respondents who self-defined as babalaos, santeros(as) or practitioners (this number includes one Palero and one Espiritista). Ten respondents were male and 12 female. Seventeen of the santeros(as), babalaos and practitioners interviewed perform rituals that include mercury, but do not prescribe it for the individual use of their clients. Ten interviewees were themselves botánica owners. Three of the remaining respondents do not use mercury but have sold it in their places of employment. The respondents were racially and ethnically diverse including nine Cubans; three Dominicans; two respondents each from Mexico, Peru and Colombia; and one each from Brazil, Ecuador, Puerto Rico and the USA (Cuban American). Mercury obviously continues to play a role in religious and folk practices. The potential differences among these uses and their implications for exposure and subsequent health effects will be discussed below.

### *Uses of Mercury Described by Respondents*

Mercury, or azogue, is used in specific ways within Santería. It is seen as having value in and of itself. In some rituals mercury is considered indispensable; the ritual will have no validity without mercury. In other rituals mercury is considered a positive addition to what is being done, but is not essential. According to one santero respondent: 'Not every road is the same. . . . Some people can resolve their problems with a coconut or with flowers or with a squash, and other people need to use mercury.'

The uses that seem to have the closest ties to religion (as opposed to what were considered by our respondents to be general folk uses for luck, protection, etc.) have not yet been reported in the literature. Here we describe the health implications of some of these practices. Out of respect for the secrecy of the religion, we will not reveal ingredients other than mercury and the medium in which it is contained. It is also important to note that media used in Santería are used for a variety of purposes and treatments, many of which do not contain mercury. For example, we report uses below that involve gourds. Observers or researchers who come upon a gourd in other contexts should not assume that they know what it represents, nor should they assume that mercury was used in its preparation.

Two of the principal religious uses of mercury have to do with the physical representation of specific *santos*, or deities within Santería. There are two types of *santos* within the religion. The first are those which can be 'seated' or ceremonially installed in santeros' heads. These are the most important deities within Santería. The second type of *santo* or *orisha* includes those which can only be received and not placed within an initiate's head. These *santos* are seen as too overwhelming or

immature to be placed inside a person's head (Canizares 1999). Despite their superficial association with Catholic saints, all orishas are represented by various natural objects including stones, coins, bits of metal, shells, etc. When a practitioner becomes a santero/a by having an orisha ritually placed inside his head, or receives one of the other santos which cannot be seated, s/he will also receive the items which represent that santo.

The descriptions of the two santos which follow each contain mercury in different media. The santo Eleggua is received rather than 'seated'. The representation of this orisha will contain less than one capsule of mercury, placed inside the concrete Eleggua figure, shaped like a head with cowrie shells representing the facial features. The figure is then sealed. Everyone who has been initiated into Santeria should have an Eleggua. Eleggua is said to control people's destinies and is considered the Lord of the Crossroads (Canizares 1999). The Santo Osain is another saint (less familiar to non-practitioners) which is received and is prepared with mercury as well. According to Felipe, an Afro-Cuban santero:

We as santeros use azogue in gourds to make Osain. There are different things inside the gourd, but azogue should definitely be there. I can't tell you more about the other things because it's secret. After putting in the ingredients, the gourd is closed and sealed with wax.

At least one capsule would be used (depending on how you were taught) along with a number of other items. The gourd is hung in front of the door (inside the house). Not everyone would have this santo. Osain represents nature's force and the plants that are the source of all medicine. It would be common for someone with health problems to receive this santo.

In the belief system of Santeria there are various ways in which mercury may be used to address spiritual problems. Most of these problems would have to do with a perceived lack of balance surrounding the client. This lack of balance may manifest itself in health problems, bad luck of some sort, or a general spiritual or psychological malaise. In order to attract *ashé* or positive order and balance, rituals involving mercury could be used. A santero or babalao would prepare these *trabajos* or treatments, which other individuals would not have the knowledge to replicate. The santero or babalao would have a number of possible treatments that he or she could select. Thus mercury is not seen as essential for any particular problem, but it is viewed as a powerful resource that can be brought to bear for those individuals in need. These treatments are not given to all adherents, and are not given on a regular basis to any individual, but only to certain individuals who seek help for particular problems in their lives.

Table 1 provides a brief summary of religious treatments which might use mercury. It should be noted as well that there may be variation in the preparation of the treatments. This information is provided solely as an example of religious preparations. This table is not exhaustive, but does describe some common treatments used in Santeria. These are prepared by santeros and not self-administered

**Table 1** Religious Treatments Using Mercury

Container	Duration	Amount used	Location	Enclosure description
Gourd	21 days	½ capsule	Outside	Gourd sealed with wax and dirt
Glass with water	7 days	½ capsule	Inside	Under water
In ice	7 days	½ capsule	Inside, in freezer	In paper, in ice, inside a can, in freezer
Apple	4–7 days	½ capsule	Inside	Inside apple
Glass bottle	Indefinite	1 capsule	Outside, buried	Glass bottle corked and buried

(the only exception would be an initiated santero/a who is doing a treatment for him- or herself). However, individuals typically purchase ingredients and bring them to the santero/a, who performs the ritual with them. This transportation of materials introduces the possibility of spilling mercury and subsequent exposure.

As can be seen in Table 1, several preparations (the gourd and the glass bottle) are only used outside. One of the treatments that is for indoor use is placed inside several other media before being frozen in ice. The mercury placed in a glass with water and the mercury placed in the apple are not ‘enclosed’ per se, yet neither is completely exposed. While risk of exposure varies according to the enclosure of the mercury, it would be less than would occur in a spill which was not cleaned up properly or in a sprinkling scenario.

Disposal of the materials after use varies by treatment, but is usually done by the recipient rather than the santero. This may involve putting them in a conventional garbage or sewer collection. Other places of disposal might be a cemetery or a river or ocean. There is no one preferred disposal method. This raises some environmental concerns, particularly for water quality and exposure in biota. More analysis is required to determine the total environmental impact of such activities, and how they compare with large-scale industrial mercury pollution.

The greatest concerns associated with the practices described here are evaporation of liquid in which mercury is submerged, along with accidental leaks and spills of mercury. The latter may be fairly likely given the common practice of dispensing mercury in gelatin capsules. The concerns for santeros and babalaos, as preparers of these treatments, and for recipients as handlers of the ingredients are similar to current concerns about domestic mercury spills. That is, spilled mercury can contaminate the air if not cleaned up properly. As mentioned above, inhalation exposure from breathing air contaminated with mercury has neurological effects, of greatest concern to children whose brains are still developing.

In general, our informants were unaware of the hazards of mercury. Several respondents mentioned that they knew that it was bad to touch or play with it. ‘There’s nothing wrong with mercury, but you should be careful not to touch it too much. They say it’s bad.’ None of them knew about the dangers of mercury vapors or the possible effects of long-term exposure. The only ‘hazard’ they

mentioned was the legal trouble they thought one could get into if one was caught with mercury.

#### *Uses of Mercury Not Affirmed by Our Respondents*

We found no evidence supporting the sprinkling of mercury droplets or recommendations of mercury sprinkling by santeros or babalaos, despite the frequent reports of this activity in the literature (Wendroff 1990; Zayas & Ozuah 1996; Johnson 1999; Riley *et al.* 2001). Most were not familiar with the practice. Several of the babalaos and santeros interviewed in Hudson County were surprised to hear of these uses (sprinkling, burning, etc.) being attributed to religious practice. Several Cuban babalaos and santeros stated that because mercury is so powerful, using too much or sprinkling it in one's home or workplace could actually backfire and bring bad luck. According to one babalao: 'You want to be careful. It's not to be used lightly. If you use it too much you might have bad luck instead.'

Because of our respondents' reactions, and because the sprinkling activity is generally discussed as being self-administered, it is unlikely that it is used in traditional Santeria. Respondents reported prescribing rituals involving mercury (to be performed for the client by a santero or babalao) but not prescribing mercury by itself or for a client's individual use. Santeros and babalaos have been specially trained and do not share their secret information with their clients. Many rituals are quite complex and those who perform them are well compensated for their time and specialized knowledge. Obviously, teaching the non-initiated to perform their own rituals would not be good business practice as the santero/a babalao is paid for the ritual they perform.

Several babalaos confirmed that when babalaos and santeros whom they know prescribe a powerful ritual or something that requires mercury, the babalao or santero goes to the person's house to perform the ritual. They don't simply tell the client what to do and send him on his way, as seems to be the case with sprinkling practices as reported in the literature. While it is possible that sprinkling could be a practice among some practitioners and not commonly known to santeros in our research area, we suspect that the literature has misattributed sprinkling to Santeria (and to religious practice in general); due to a tendency to consider all practices and all ethnic groups together under one 'Santeria' label.

Other babalaos in our study reinforced that mercury is not prescribed for sprinkling. They stated that people who say that the santeros are recommending the sprinkling or burning of mercury are spreading falsehoods. According to one:

They are envious of the religion and trying to give it a bad name so it won't spread. Since people are worried about mercury and think it's bad, the people that are against the religion say that we use it and tell others to use it.

All agreed that part of their job is to conduct the actual ritual, not just send clients to do things on their own.

Our interviewees further raised the issue of cultural diversity within the religion as a source of variation in practice, although they would not consider those variations to be part of the religion. Although purely anecdotal, the babalaos said that they thought Dominicans, Puerto Ricans, Mexicans, Brazilians or Nigerians could be the source of the sprinkling practice. In other words, there was not a clear idea about the origins of sprinkling practices. There was also a perception among babalaos that there are people, principally some white Cubans, who get into Santeria just to make money, without knowledge of African custom which they speculated could lead to altering traditions to suit economic interests.

Another element which could potentially affect practices involving mercury is the publication of several do-it-yourself Santeria guides which include instructions and ingredients for spells involving mercury. These are frequently sold in stores specializing in new age spiritual products and books as well as larger book stores and on the Internet. One such book (Gonzalez-Wippler 1992) includes a chapter on the 'magic spells of Santeria'. This chapter includes two recipes for spells which include 'quicksilver'; one to 'force a reluctant man into marriage' and the second to be used for bank transactions. Although these rituals may be used by some, they were not familiar to the santeros and babalaos we interviewed. The diffusion of these books among those who may be interested in Santeria also introduces the idea of mercury use within religious practice. Gonzalez-Wippler has been criticized by the Santeria religious community for her portrayal of the religion, but was, until recently, one of the few authors who wrote on the topic, especially for a non-academic audience.

### *The Role of Fear*

One issue that came to the fore during fieldwork was the climate of fear surrounding the subject of mercury. This topic merits discussion because it affects outsiders' (be they researchers or public health workers) efforts to discuss mercury with community members. We continually observed a fear of prosecution and persecution among our study participants. Of the 22 respondents interviewed, 12 brought up concerns about mercury sales being illegal, and fear of inspectors. It is important to re-emphasize that mercury is not an illegal substance, yet respondents believe it is. Several botánicas who had previously kept mercury on the premises were now much more secretive. Two interviewees, a Brazilian Espiritista and Candomblé practitioner, as well as a Cuban santera, declined to discuss how each used mercury. Both had spoken at length about other areas of ritual practice, yet stated that they weren't interested in discussing mercury. These fears stem from events experienced by immigrants in this area, as recounted below.

A Mexican botánica employee who is not a practitioner stated that they do not sell mercury in the botánica because it is illegal. R.C., an Afro-Cuban who owns a botánica with his wife, does not sell mercury in the botánica (although he did in the past), but obtains mercury from thermometers when he needs it. According to this

participant, he stopped selling mercury because, 'it's too much of a hassle. It's illegal and you can get in trouble.' Two grocery store workers, one Ecuadorian and one Dominican, both in their mid-20s, told us that the bodega where they work used to sell mercury but that it no longer does. The Dominican stated that this was because mercury sales are illegal.

A Cuban botánica employee said that she has sold elemental mercury in the past but her boss received a letter from Public Health saying that it was illegal to sell mercury. According to officials with the county health department, no such letter was ever sent. A Dominican botánica owner said that she no longer sells elemental mercury because of the crackdowns by the inspectors. She did say that she may perform rituals containing mercury for someone in a spiritual consultation, but that she does not sell it herself. Fear of reprisals by officials made obtaining more information difficult.

Carlos Antonio, a white, Cuban American santero (33 years old), was very forceful in his statements about mercury. He doesn't sell mercury and doesn't want to know anything about it because of the inspectors. According to Carlos Antonio, you can get into a lot of trouble if you are caught with mercury and it's not worth the trouble for the small amount of money it brings in. Of all respondents, he was the most adamantly opposed to mercury, but for legal reasons rather than potential dangers to one's health. Carlos Antonio stated: 'It's illegal. That's all there is to it. You can get into big trouble and it's not worth it. It is really just a small part of business anyway.' He does use mercury in his own personal rituals, but said that he does not recommend its use to others.

Several respondents also stated that mercury use had become more scrutinized by the government in the post-9/11 environment. One respondent said that you could end up in jail if you were caught with mercury. Another stated that getting caught with mercury could be just as bad as being caught with an explosive device or a bomb: 'Ever since September 11th, the government has been looking for people who may have mercury. You don't want to get caught with it. You can go to jail.'

These perceptions affect individuals' behavior. For example a Colombian santera and botánica owner lamented the fact that it's now more difficult to sell mercury, which once made up an important part of her sales: 'Many people used to buy it. It's very powerful. I don't think that it's a bad thing, but I don't want to have problems either.' She has sold mercury to other Colombians, Mexicans, Cubans and North Americans. She keeps it in her house rather than the botánica and prefers to sell larger quantities, although she used to sell capsules as well.

A woman who is both a Cuban santera and the wife of a Puerto Rican botánica owner reported that they sell mercury capsules only to people with whom they feel comfortable. Mercury capsules are very cheap in this botánica (\$1.50). Their logic is that people won't report them if they get a bargain, but one possible consequence of this practice is to increase sales at the bargain price. Maria, the santera, stated:

We could get in trouble so we only sell to people that we know very well. There are always other people out there who are looking to make trouble, so we try to be careful. In fact, we usually only sell to people who are already our customers.

What is important about this climate of fear are the potential ramifications for health policy and intervention. True or not, individuals believe that they can be punished for selling, purchasing or even possessing mercury. Thus, there is a tendency to deny mercury use within the community at the same time as it plays an important role in certain ritual practices. One respondent declared: 'They tell us not to use it and say it's bad. Of course, if they need to people will use it. They just won't talk about it.'

## **Discussion**

Our findings show that there are specific types of mercury use within Santeria as practiced within our study area. These practices differ from those previously reported in the literature. However, previous practices were not linked directly to religious practice of Santeria, suggesting that practices reported previously may stem from other cultural or religious traditions outside of Santeria. It is also possible that variants of Santeria in other areas incorporate some of these previously reported activities.

Of the previously reported activities, sprinkling has the potential to result in the highest exposures. The use of pan-ethnic labels and the nature of religious identity make it difficult to locate people who may in fact be sprinkling mercury in their homes. More research is needed to locate and understand sprinkling practices. Who recommends them, who practices them and how often? Our limited information suggests the Dominican community is a place to start, although it is clear from our work that many Dominicans have never heard of this practice either. While members of the non-Hispanic population may see one large ethnic group with many commonalities, community members themselves see important cultural differences between groups. In fact, respondents were quick to point out the differences to our interviewer, and emphasized that many religious newcomers had very different cultural backgrounds from the traditional Afro-Cuban background. Thus, attempts should also be made to differentiate between various ethnic backgrounds within the Hispanic or Latino community, as well as religious and folk practice. As long as this diversity in the population is ignored, health education efforts related to mercury use will have mixed success.

Continuing to focus research and outreach programs exclusively on the Santeria community with its history of persecution will only exacerbate strained relations and make it increasingly difficult to obtain accurate information. Already, the perception of illegality and the belief that there are legal ramifications for possessing mercury has made many interviewees wary of discussing the topic. Producing and disseminating public health warnings about sprinkling practices that mention Santeria can also contribute to the lack of understanding of Afro-Cuban religious practices.

Best practices in research and outreach in the community require developing a knowledge and sensitivity about the religion and its values, as well as the overall cultural context. It is important to avoid assumptions about the significance of cultural cues. For example, some might erroneously assume that finding certain objects, such as a candle of the seven African powers, at an exposure site automatically links it to religion. In fact, many people may own or use such a candle for numerous purposes, many of which are not religious. Likewise, in developing risk communication materials, it is important to remember that referring to specific religious practice makes secret information public and can damage already tenuous relationships with the community. Misidentifying practices that are not considered a true part of the religion can be seen by practitioners as irrelevant and out of touch—or worse, as an attack on their beliefs.

Much care should also be taken to avoid the development of an implicitly racialized view of Santeria and other Afro-Cuban religions, that is, the idea that one's race is the sole determinant of participation. Despite Santeria's roots as an Afro-Cuban religion, many people without claim to African ancestry participate in the religion as well. Environmental health programs that assume a strong association between race and religion will leave out individuals who use mercury, as well as unjustly involve those who do not in fact participate.

Our fieldwork has emphasized the importance of differentiating between religious and folk uses of elemental mercury. This is a complex and difficult distinction to make, but it is important because it matters to babalaos and santeros. As initiated religious practitioners they distinguish among different practices. Thus they recognize a boundary between religion and folk tradition. Despite variation among santeros, there is still general agreement about how rituals should be conducted, as well as the correct use of specific plants, herbs and other substances.

We have learned that Cuban Santeria practitioners are not using mercury in the ways that result in the highest potential exposures. They are using mercury, however, and it is important to be sure practitioners receive information about hazards related to spills and vapor exposure. Appropriate communication about mercury for Santeria and Palo practitioners would not mention the religion but simply discuss mercury and its exposure pathways, accidental spills and how to clean them up. The santero network may be the best conduit for distributing such materials on mercury hazards, especially if santeros participate in developing them. We believe santeros might cooperate in such an effort because it is consistent with their role as experts, with specialized skills that should not be practiced by just anyone.

Finally, the risks from mercury exposure need to be placed in context with other health risks in the community. There are numerous health issues in Latino communities in the USA that require prioritization for action. Community autonomy in prioritizing and managing risks should be respected and supported wherever possible, while ensuring that the needs of small or marginalized subpopulations are not lost in the process.

Environmental health officials in the USA should consider addressing the low public awareness of exposure pathways for elemental mercury across the board, as well as methylmercury, and the differences between the two. Locally sponsored collection days continue to bring in large quantities of mercury, reminding us that mercury is still widely available, with wide-ranging histories of storage and use. For example, in 2001, 1,400 lbs were collected from Massachusetts municipal waste collection centers, and 1,218 lbs from Connecticut homes (Goldberg 2002). There is a great need for general mercury education. Latino and Caribbean communities should not be left out of such efforts, nor should they be singled out for exclusive focus.

### **Conclusions and Recommendations**

Mercury continues to be used in the Latino communities in the study area of northern New Jersey. Ritual practices involving mercury tend to be restricted and are conducted in private homes or botánicas. Mercury is used in certain Santeria practices that are explicitly religious, and in selected treatments to assist clients with problems. These uses do not involve sprinkling of mercury, and mercury is typically not exposed to open air. Future work could examine mercury emissions from the preparations described in this study, which are attributable to Santeria. It is suspected that exposures are much lower than from those in which mercury is in contact with air for prolonged periods of time.

Respondents were not aware of the hazards of mercury exposure, nor of the existence of mercury vapors. Several respondents did mention that it was not good to play with mercury or allow it to touch other metals, especially gold. In fact, mercury was only seen as 'dangerous' because of the perception that selling, possessing and using it was thought to be illegal. Some santeros mistakenly believe that skin contact rather than inhalation is the primary exposure pathway. 'I was told not to touch it too much that it could be bad for you', was a common theme in our interviews.

The information presented here is a first step toward gaining a better understanding of the various religious and/or cultural uses of elemental mercury. Santeria practitioners in our study differentiated between those uses that are acceptable within their religious practice and those that are not strictly religious. At the same time, the difference is difficult to disentangle as individuals may engage in both religious and cultural practices. More work should be done in this area.

Based on our experiences in the field, we feel that reliable information can only be obtained by cultural and religious 'insiders'. Santeria is a religion where maintaining the secrets is of utmost importance. In fact, santeros have been known to provide erroneous information to researchers who were seen as religious outsiders. Even when researchers are members of the larger religious community, time is needed to establish rapport.

This kind of work is a necessary precursor to quantitative modeling or measurement that seeks to determine the actual exposures resulting from folk and religious practices involving mercury. An insider's understanding of mercury use is an

essential element of any successful and realistic exposure assessment, policy intervention or community health education program.

There is a local perception that one can be arrested and imprisoned if caught with mercury. Recent educational efforts, the events of September 11 and bans on mercury products in other states and communities appear to have encouraged this notion. The subject has become taboo, especially in conversations with those perceived as outsiders. This creates a secretive, and potentially hostile, environment for conducting interviews or outreach programs. Publicity has already driven mercury sales underground in Hudson County. Further regulation, including banning sales of mercury, may effectively criminalize the practice without reducing sales or usage.

An educational program aimed at those who sell mercury, recommend its use or use it themselves is essential. Such a program should clarify the nature of the hazard from elemental mercury, emphasize the need to minimize its use and demonstrate the necessity of keeping it in closed containers. Recommendations for disposal of mercury and cleanup of spills should also be standardized across health agencies, and included in communications about mercury.

Care must be taken not to alienate specific religious communities as well as Latino groups in general. Religious and cultural uses of mercury should be viewed in the context of larger health issues within these communities where many individuals may be marginalized economically as well as lack access to the health and mental health care system. A better understanding of Latino community health in general will help researchers to understand the role of mercury in religious practitioners' perceived mental and spiritual well-being.

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