

Below is a longer version of the original article.

The abridged version of this article that was eventually accepted and published by the *Journal of Medical Ethics* is found here:

Tham J, Sem G, Sit E, *et al* The ethics of betel nut consumption in Taiwan *Journal of Medical Ethics* Published Online First: 06 March 2017. doi: 10.1136/medethics-2016-103990
<http://jme.bmj.com/content/early/2017/03/06/medethics-2016-103990>

The ethics of betel nut consumption in Taiwan

Joseph Tham¹, Geoffrey Sem², Eugene Sit³, Michael Tai⁴

¹ Joseph Tham, LC, MD, PhD, Dean, School of Bioethics, Regina Apostolorum Pontifical University, Rome, Italy. jtham@legionaries.org

² Geoffrey Sem, Faculty of Health, School of Kinesiology and Health Science, York University, Toronto, Ontario, Canada. semgeoffrey@yahoo.ca

³ Eugene Sit, Medical Student, Faculty of Medicine, University of Hong Kong, Hong Kong, SAR. sityingkit@hotmail.com

⁴ Michael Cheng-tek Tai, PhD, Chair Professor of Bioethics and Medical Humanities, Chung Shan Medical University, Taichung, Taiwan. taimichael@hotmail.com

We would like to thank Rachel Wong for helping out in the preliminary bibliographical research. We would also like to express our gratitude to Alex Yeung, Roland Chia, Daniel Tsai, Jennifer E. Miller, Chunyan Ding and Alberto Garcia for their time in reading this article providing their valuable feedback.

Abstract

This article addresses the ethics of betel nut use in Taiwan. It first presents scientific facts about the betel quid and its consumption and the generally accepted negative health consequences associated with its use: oral and esophageal cancer, coronary artery disease, metabolic diseases, and adverse effects in pregnancy. It then analyses the cultural background and economic factors contributing to its popularity in Asia. The governmental and institutional attempts to curb betel nut cultivation, distribution, and sales are also described. Finally, the article analyzes the bioethical implications of this often ignored subject from the perspectives of human dignity, the good of health, vulnerable groups, cultural diversity, informed consent, and ethical blind spots.

Keywords

Betel nut, bioethics, medical ethics, addiction, oral cancer, indigenous population, vulnerable groups, behavioral ethics.

Introduction

A visitor to Taiwan may be surprised by the abundance of betel nut stands all over the country, often advertised with neon signs and scantily clad young women. She will be even more surprised if she is aware of the well-documented deleterious health effects of the betel nut. Taiwan has the highest incidence of oral cancer in the world.[1] From 2001 to 2012, the incidence of oral cancer increased by 20.7%. [2] Esophageal cancer was the sixth leading cause of cancer death among men in Taiwan in 2003.[3] Coronary Artery Disease (CAD) is the second leading cause of death after cancer which accounted for 10.8% of all deaths in Taiwan in 2010.[4] All these statistics are related to the chewing of the betel nut.

The betel nut is currently one of the most widely used uncontrolled addictive substances around the world, with 10 to 20% of the global population consuming it.[5] In fact, with regard to

the worldwide popularity of central nervous stimulants, the betel nut ranks fourth after nicotine, alcohol, and caffeine.[1]

When one learns about the dire health tolls of this nut on the population and the fact that little has been done to curb its use, it seems that an ethical analysis of this oft-ignored social problem is overdue. In fact, a cursory search on the database of the Kennedy Institute of Ethics did not yield a single result when the words “betel nut” were entered.¹ While betel nut consumption is a worldwide problem, this paper will look primarily at the situation in Taiwan. We will first provide the scientific and medical facts about the betel quid, followed by the socio-economic impact it has on the Taiwanese population. We will proceed to provide bioethical reflections on the following topics: health as a fundamental good, the tension between health and cultural practices, the need to protect vulnerable populations, the need to provide correct information for decision making, and behavioral ethics in institutional and organizational responses to the problem.

Scientific and Medical Aspects of the Betel Nut

The betel quid, more commonly known as the betel nut, is composed of areca nuts wrapped in a betel leaf coated with slaked lime. The areca nut is the seed of the *areca catechu* palm tree found in many Asian countries, whereas the betel leaf comes from the *piper betle* vine which is a mild stimulant.[6] There is a broad spectrum of additional ingredients that can be included when preparing the betel quid, such as small amounts of tobacco, spices such as cardamom and saffron cloves, sweeteners, lime, and catechu. The areca nut itself can be prepared in different ways: green, unripe, fermented, boiled, or sweetened.[7] Preparation of the betel quid varies among countries. For instance, tobacco is never added to the betel quid in Taiwan and Papua New Guinea while this is a practice in mainland China and Malaysia.[8] In India, non-perishable commercially prepared forms of betel quid has become available, and may pose even graver health risks.[9]

The areca nut contains pyridine alkaloids such as arecaidine, arecoline, arecaine, arecolidine, guvacine, isoguvacine, guvacoline, and coniine. These structurally related alkaloids are intoxicating, addictive, and carcinogenic, and they release adrenaline when consumed. The methyl esters of arecoline and guvacoline hydrolyze to their respective acids, arecaidine and guvacine. This reaction is then catalyzed by the slaked lime on the betel leaf and as a result, arecoline is present in the nut as a salt.[10] The most common stimulant alkaloid in the areca nut is arecoline, which has severe effects on various neurotransmitters, especially upon cholinergic neurons. It is a parasympathomimetic agent and has the ability to stimulate sweating and salivation.[11] The betel quids in Taiwan are usually prepared using a piece of unripe piper betel fruit, which has 1% of safrole, a known carcinogen.[4]

The chewing of betel quid has been strongly correlated to adverse health effects including increased risks of developing oropharyngeal cancer, oral leukoplakia, oral mucosal lesions, oral submucous fibrosis, gum disease, liver cirrhosis, hepatocellular carcinoma, obesity, metabolic syndrome, diabetes mellitus, hypertension, asthma, and cardiovascular disease.[2], [4] In 2004, the International Agency for Research on Cancer declared the chewing of betel quid to be a (IARC) carcinogen.[12] The areca nut and betel leaf have shown mutagenic, carcinogenic, and genotoxic properties in both in animal and *in vitro* experiments. The betel quid is also known to cause cytotoxicity in mammalian cells both *in vivo* and *in vitro*. [13], [14] There is both a dose- and duration-dependent association of betel nut chewing with precancerous oral submucous fibrosis along with other types of oral cancers.[13]

¹ Research done on website on November 4, 2015. <https://bioethics.georgetown.edu/library-materials/bioethics-research-library-databases/ethxweb/>

Of all the health risks associated with chewing betel nuts, oral cancer has the strongest statistical correlation. In Southeast Asia, oral cancer is the second most frequent form of cancer, and the second most frequent cause of death from cancer among males.[2] Researchers have confirmed a relationship between betel nut use and the development of oral cancer.[14] The incidence of oral cancer in Taiwan rose by 35.74% between 1998 and 2002, and by 20.7% from 2001 to 2012.[1] This was mostly caused by increased betel nut consumption. Currently, Taiwan has the highest incidence of oral cancer in the world.[1] The relative risk for oral cancer for people who chew on betel nuts is 58.4%. There is a suspected dose response relation between betel nuts and oral cancer since both the duration and daily frequency of chewing increases one's risk of developing oral cancer.[13]

Chewing the betel nut alone is associated with an increased risk of oral cancer by 17.7%, but when combined with tobacco smoking and alcohol drinking, the risk becomes 72.6%.[1], [7] Squamous cell carcinoma (SCC) causes 90% of esophageal cancer and was the sixth leading cause of cancer death among men in Taiwan in 2003. Its incidence increased by 70% between 1990 and 1999. The chewing of the betel nut plays a relevant role in the development of SCC and adds to the carcinogenetic effect of smoking and alcohol drinking.[3]

The risk of health problems in betel nut users is exacerbated with the use of alcohol and cigarettes. ABC is an acronym given for alcohol, betel nut, and cigarettes consumption. In the 1990s, 10% of Taiwanese people above 15 years old were ABC users.[2] Another recent study shows that 17% of adults chew betel nuts, 14% smoke cigarettes, and 9% consume all ABCs in Taiwan.[7] In fact, 93% of Taiwan's betel nut chewers are also cigarette smokers.[1] The incidence of oral cancer is 123 times higher in ABC consumers compared to those who do not engage in any ABC consumption. The specific risk factors are yet to be discovered, but most oral cavity related cancers are associated with ABC consumption.[2]

For women who chew betel nuts during pregnancy, several adverse effects have been proven, including spontaneous abortions, premature labor, and stillbirth.[14] In addition, the mean birth weight of infants born was significantly lower for mothers who chewed betel nuts while pregnant. This is attributed to the fact that betel nuts inhibit the synthesis of nucleic acids and proteins in fetuses.[14]

In addition, areca nut extracts, piper inflorescence, and betel quid have been shown to enhance the cytotoxic effects of oxidized low-density lipoprotein (LDL) towards bovine aortic endothelial cells. Since smoking can enhance the oxidation of LDL and potentially lead to atherosclerosis, betel nut users who smoke have an increased risk of developing CAD. There is a 3.5 fold increased risk of CAD in betel nut users who also smoke cigarettes, have hypertension and dyslipidemia.[4]

Socioeconomic Factors and Prevalence

The habit of betel nuts chewing is culturally, historically, and socially bound in many Indo-Asian customs with a history dating as far back as 2,500 years.[15] It is a highly valued custom in many Asian countries including Taiwan, India, Nepal, Bangladesh, China, Thailand, Vietnam, Cambodia, and Indonesia.[9] In Malaysia, guests are welcomed with a tray of betel nuts whereas in Vietnam, betel nuts are used ceremonially in weddings as a symbol of love. Because of its common use during celebrations, the casual consumption of small quantities of betel nut is prevalent in these Asian communities.[13]

According to the World Health Organization, 600 million people chew some form of betel nut worldwide, and this number is increasing yearly. In Taiwan, there are currently 2 million habitual users, which accounts for 10% of the population.[5] In one study conducted in the Yunlin County of Taiwan, 17% of the population consume betel nuts, and those who chewed were more likely to be males, less educated, and between the ages of 40 to 64. They had a poor economic status, were physically inactive, infrequently brushed their teeth, and did not have regular dental checkups.[2] In a different study conducted in the Changhua County, it was discovered that 53.6% of students first experimented chewing betel nuts with a family member, and those students who had at least one family member who chewed had a higher prevalence rate of chewing than those who had no family members with the habit.[11]

Among the indigenous populations of Taiwan, it is used as a sign of love and bondage between married couples and is given as a dowry. The betel nut is commonly served in important gatherings and feasts. People believe that spitting the juice out will drive away evil spirits and protect them.[15] However, betel nuts are generally consumed because they provide an energy boost as well as some psychological stress relief akin to cigarette smoking. Additional effects include not only enhanced alertness, but also feelings of warmth, cardio-acceleration, salivation, sweating, and euphoria.[14] This makes them popular among taxi or truck drivers who spend long hours on the road and those who are engaged in heavy physical labor.

Thus, in Taiwan, the profile of a user is a middle-aged male from the south and east rural area of the country with less than 10 years of education.[16] In Taiwan's indigenous population, the prevalence rate of betel quid chewing is significantly higher, at 42%, compared to Taiwan's rate, at 10%.[14] The life expectancy of Taiwan's aborigines is one decade lower than the general population, and they are 2 to 5 times more likely to develop chronic diseases than the rest of the population. Taiwanese aborigines have a high prevalence of betel nut chewing and a low rate of quitting at 8.2% for males and 6.7% for females.[5] Betel nut chewing extends to the youths because of curiosity and the peer pressure to appear "cool". In a study conducted in the Changhua County, 48.2% of students who chewed betel nuts gave the desire to dispel chills and to refresh themselves as the main reasons.[11]

The cultivation of betel nut has also harmful environmental impacts. The palm has shallow roots and many air roots which have low soil infiltration capacity, thus causing the soil to be loose. The spread-out palm leaves and the lack of decayed leaves near the roots also make it difficult for the soil to retain water. In addition, plantations are generally maintained through mechanical means, exposing the soil surfaces completely and making it highly susceptible to erosion. There tends to be more surface runoff than in the case of other forest plants. As a result, betel plantations have caused enormous damage to the land due to loss of underground water reserves and soil erosion. Betel palms grow best on flat land, but since 70% of Taiwan is mountainous, the proliferation of betel nut plantations has displaced the land used for growing staple crops.[17] Further, betel nut consumers often spit the remains on roads, leaving red stains that are difficult to clean. In order to attract customers, there are many booths on the road staffed by scantily clad young, uneducated, and sometimes underage females. There are 60,000 such young women, attracted by the glamorous lifestyle and easy work, since booth owners offer them fashionable clothing and cosmetics to attract male customers.[18] Besides the fact that these booths may block traffic and destroy the city's image, there have been concerns that the trade might lead to possible prostitution, exploitation of women, corruption of the youth, and a general lowering of the moral standards of the society.[16]

The betel plant is relatively easy to cultivate. Only eight persons are needed to harvest three acres. Thus, in 2003 there were 2.2 million people working in the betel nut industry.[19] In a 2010 report, betel nut farming ranked second among the crops produced in Taiwan after rice, fourth

among all agriculture products including crops and animals. Taiwan's area for areca nuts has been expanding yearly. In 1981, there were 10,131 acres dedicated to the *areca catechu* palm, with 6,483,000 plants and by 1990, the planted area increased to 88,366 acres with 37,323,000 plants grown.[11] The total production of betel nut is 124,000 tons in 2013. The betel nut industry nets a \$100 billion NTD (\$3 billion US) each year.[20]

Due to specific government policies, betel quid production grew very fast from the post WWII era to the 1990s. Each *areca catechu* palm can produce on average 300 areca nuts per year, and each nut is worth approximately \$0.002 NTD to produce, and sold to customers for \$2–50 NTD depending on the season.[11] The land reform after the war made it necessary for farmers to cultivate alternative crops in order to survive, and the high profit margin of the betel nuts became a natural choice. One study summarizes the dynamics of this change as follows:

Taiwan is the world's second highest producer of betel nut and most of this production is for a domestic market. According to a 2003 National Statistics Bureau report, only .4% of that product was exported. Since Taiwan entered the WTO in 2002, 1,806.5 tons of betel nut was imported a year to supplement national production but this import only accounted for 1% of national consumption. Taiwan has a 3.3 million consumer base and many of these consumers chew up to 50 betel nuts a day... Farmers needed a crop that could subsidize the unsustainable livelihood that the government had forced on them. Young industrial workers needed to endure long hours of repetitive work. Betel stalls also provided a social gathering ground for the industrial workers that had just migrated to the city. Betel nut—a powerful, energizing stimulant—not only sustained these laborers through their long hours but the stands where it was sold provided a sense of community around the stands. As a low maintenance cash crop, mass consumption of the stimulant also created a niche for farmers.[19]

Actions Taken by Taiwanese Government

Given the deleterious health, environmental, and social effects of betel nut, the Taiwanese government eventually began to curb its cultivation, usage, and commerce. As early as 1997, there was a governmental document entitled “Management Plan for the Control of the Betel Nut Problem” that made several proposals to this effect. The guidelines included: 1) the preservation of water and soil resources; 2) the prevention of illegal betel nut imports; 3) the regulation of betel nut commerce and imposition of taxes; 4) the ban on betel nut booths that block traffic and exploit young girls; 5) the decrease and prevention of betel nut chewing habits among youth; 6) the decrease of the national rate of betel nut consumption; 7) education in schools about the harmful effects of betel nuts to a level of 95% awareness; 8) a decreased rate of consumption among soldiers; 9) fines imposed on those who spit betel nut juice in public areas; and 10) increased research of issues related to the betel nut.[21]

In 2002, Taiwan became a member of the World Trade Organization. Thus, betel nut became one of the agricultural products regulated and taxed. Several laws were passed between 2002-2007 which restrict the importation and exportation of betel nuts with imposed taxes. In 2007, the Taiwanese government began to provide incentives to farmers to convert their plantations to grow other products. The same year saw a greater restriction on betel nut imports at certain times of the year and a more stringent control of private and public land used for plantation. [22]

The 2008 regulation entitled “Destroy the betel nut farms use them for other purposes”: i) provided financial support of \$150,000 NTD per hectare in order to destroy betel nut farms; ii) provided reimbursement of half the fee in order to plant some other crop, up to a maximum of

\$50,000 NTD; iii) stipulated that those who received this support could not grow the betel nut on their land for the next 5 years; and iv) aimed at converting 100 hectares of betel nut plantations per year for the next 5 years. The results were moderate.[23]

Another document from September of 2014, the “Management Plan Concerning the Betel Nut,” intended to destroy 10,000 hectares of betel nut farms over the next three years. It sought to investigate and deal with the illegal use of government-owned land for betel nut cultivation; decrease the number of industrial farms and government-owned land that is being used for this crop beyond a certain limit; decrease the use of private lands above the accepted limits; and subsidize farmers to encourage them to switch crops.[24] There were also government efforts to encourage different uses of betel nuts as an alternative food source (betel nut feast, stir fry quid, betel nut ice cream and wine), medicines, detergents, dyes, and even shoe making.[25]

The Taiwanese government is aware of the importance of primary prevention of betel nut-related health disorders such as oral cancer, CAD, and metabolic syndromes. In most cases of oral or esophageal cancer, the treatment options are limited and the five-year mortality rate is high: 43% for oral cancer [26] and 83% for esophageal cancer.[27] Most consumers of betel nuts are unaware of the serious health risks associated with it until it is too late. Education efforts have been aimed at the at-risk adult population to help them quit and at the younger generation, informing them about the dangers of betel nuts. As mentioned earlier, chewing betel nuts during pregnancy can affect the development of the fetus. Since only 45% of aboriginal mothers are aware of these harmful effects, prenatal counseling in this area is sorely needed.[14] There have been efforts to focus on tackling the ABC habits by promoting health awareness in Taiwan. 13.4% of betel nut users in Yunlin County were able to abstain from the habit for more than one year, showing that it is possible to initiate health promotion programs and reduce the rate of oral cancer. Strategies have been devised to encourage individuals who chew betel nuts to engage in physical activity or to take care of their oral health.[2] Taiwan has also officially declared an annual “Betel Nut Prevention Day”, in hopes of reducing oral cancer mortality rates by spreading awareness about its risks.[6] Currently, in Taipei, if anyone spits betel nut juice in public, he will be fined and required to attend mandatory withdrawal classes.[28]

Even though the deleterious effects of betel nut consumption have been known since the 1990s,[6] and the first law about curbing this problem in Taiwan was drafted in 1997 entitled “Management Plan for the Control of the Betel Nut Problem”, it appears that regulations were not seriously implemented until a decade later. The causes for this delay are manifold. There was resistance from the farmer lobbies who had the most to lose because of the huge profit margin in betel nut sales, as well as from the indigenous representatives who saw the betel nut as a part of their local customs that should not be discouraged. Betel farming has become an important income for the Taiwanese nation, with the result that policymakers are reluctant to propose radical changes that could affect the economy.[29] For instance, in a recent meeting on oral cancer prevention, the participants made the observation that:

A 2012 follow-up report noted that there was not much improvement after the 1997 “Management Plan for the Control of the Betel Nut Problem”. When the 14th Government Executive meeting decided to defer the issue in 2012, the different departments became more passive, leaving the Health Department to fight the war alone without a concerted effort. It was not until the 2011 “Education Plan on Betel Nut Prevention for Children and Adolescents” that there was active collaboration. (*translation from original Chinese*) [30]

In fact, despite government efforts, the trend in betel nut chewing among teenagers has not decreased a lot in the past 10 years.[31]

A 2013 report from the Control Yuan of the Taiwanese government made several strong and stinging remarks about the faults of the different governmental agencies.[29], [32] The report stated that even though the IARC declared the betel quid to be a Group 1 carcinogen, not enough had been done to defend the health of the Taiwanese population. It blamed the Executive Yuan of the government for neglecting to implement with greater rigor the 1997 “Management Plan” and to coordinate this effort among the different branches of the government. It blamed the Agricultural Department for not being able to timely reduce and control abuses and production of the betel nut, and for not being active enough in addressing the root causes. The Council of Indigenous Peoples was chastised for not giving sufficient warning about the health effects associated with the betel nut. Its policy of protecting indigenous practices (which include the use of the betel nut) contradicted government policies. The Department of Education also was not very successful in its effort to lower betel nut use among students; and the Department of Finance was not able to continue the establishment of taxes and levies on the betel nut due to a lack of manpower.

The government could learn much from the policies that have been successful in reducing the habit of cigarette smoking. Such policies include labeling betel nut products with the proper health warnings. This may not be easy because while cigarettes are always sold in packages, betel nuts are sold fresh on the streets.[13], [33] There could also be laws to restrict the sale of betel nuts to underage groups, since the average age at which users start chewing betel nuts in Taiwan is thirteen.[2] Just as increased taxes on tobacco caused a definitive reduction in smoking habits, taxing the betel nut might have the same effect. However, the presence of black markets could keep up the supply at a cheap price, rendering the tax counterproductive.[13] According to another study, a good approach would be to apply taxes on wholesalers who are easily identifiable and make the greatest profit from the industry. Applying a betel nut surcharge on them would be more acceptable to the public. The revenue from the levy could contribute to the national health insurance to treat betel nut related illnesses and for educational purposes.[1]

Bioethical Reflections

Betel nut consumption in Taiwan provides an interesting case study related to many bioethical issues. We have before us a culturally accepted addictive habit with dire medical consequences for a vulnerable population. The government of Taiwan is aware of the need to foster the well-being of its citizens, and its failure to do so may have a significant societal impact. The possible financial gain from the betel nut trade is offset by the enormous health burden of those affected by the consequences of its consumption. The dignity of the human person demands that great efforts be made to protect his health and thereby promote his general wellbeing.

Here, there might be conflicts between those who emphasize health and those who emphasize their cultural identity concerning the betel nut. At the same time, the indigenous population is more vulnerable because of its lack of education and social status, making it difficult for natives to make informed choices.

Many of these problems are present in the public health debates on cigarette smoking, alcohol consumption, and substance abuse.[34] The ethical issues related to them can similarly be seen in the case of the betel nut.[35, pp. 191–267] Likewise, while the detrimental effects of smoking, alcohol, and drug abuse had been demonstrated scientifically, the acceptance of this evidence was delayed because of the huge financial investments made by multinational enterprises in these trades.[36] The tobacco and alcohol industry notoriously invested in publicity and lobbying efforts to delay the introduction of regulations that could lower sales. [37] Illegal drug trafficking is a global problem involving huge sums of money, and from time to time there are initiatives to

decriminalize the so-called soft drugs. Thus, government health policies invariably have had to overcome enormous obstacles posed by powerful industrial lobbies with great influence in the political, scientific, and academic circles as well as the mass media. [38]

In both cases, the time-proven approaches to curbing these addictions are: taxation and smuggling prevention, the application of health danger labels, pregnancy warnings, age limits on consumers, advertisement bans, restricted of use in public spaces and the workplace, and educational, health, and media campaigns.[39] The obstacles and delaying tactics faced are also alike.[40] Nonetheless, compared to the multibillion-dollar tobacco and alcohol industry, the betel nut trade is much smaller. Betel nuts are grown by local farmers, and the production chain and distribution are relatively unsophisticated. Still, we can observe very similar delaying tactics due to the interests of those who have much to lose financially. The government of Taiwan is at a privileged position to implement many of the above-mentioned policies precisely because there is not a large-scale industrial production like tobacco or alcohol. Even from a utilitarian point of view, the financial burden of diseases caused by the betel nut greatly outweighs the potential benefits from the trade. In India, the availability of newer imperishable and more carcinogenic forms of the betel nut has generated a US \$500 million industry in two decades, and so Taiwan should take heed before it is too late.[9]

The indigenous population is at a greater risk because its socioeconomic status makes it more vulnerable. Indigenous persons are more prone to betel nut addiction due to their lifestyle and work and other cultural factors.[41] The poor and uneducated, betel nut beauties, the youth, and pregnant women are also at risk. As vulnerable groups in society, they need greater protection from the government to look after their wellbeing and health interests. The 2005 UNESCO Declaration on Bioethics and Human Rights formulated the Principle of Vulnerability and Personal Integrity. Article 8 of this declaration states:

In applying and advancing scientific knowledge, medical practice, and associated technologies, human vulnerability should be taken into account. Individuals and groups of special vulnerability should be protected and the personal integrity of such individuals respected.[42]

This principle has two sides to it: it advises restraint so as not to harm or wound those who are vulnerable as well as looking out and providing for the basic or special needs of such individuals or groups. This principle also calls for an increased vigilance by governments and individuals in protecting the wellbeing of vulnerable subgroups.[43] In the language of principlism in popular Western bioethics literature, this corresponds to the principle of beneficence and nonmaleficence.[44] Related to this principle is that of informed consent, which also has a venerable tradition in the field of bioethics. In our case, vulnerable groups have the right to information about the deleterious effects of betel nut chewing so that they can make informed choices and can be aided if they desire to quit.

In the West, advocates to decriminalize psychoactive agents often appeal to the liberal arguments of individual freedom and personal choice. Due to the cultural difference in Asia, however, the argument is less based on libertarian ideals. Some local groups have argued that chewing the betel nut is part of the indigenous way of life in Asia and especially Taiwan. Thus, they have pitted health against cultural identity. However, there is a hierarchy of goods: not all goods are equal. One can presume that life and health are fundamental goods that other goods—even cultural goods—depend on. However, in this case, even though betel nut consumption has been a part of the Taiwanese culture, it is neither universal nor always perceived as an unquestionable good. Cultural practices are not static. Certain habits can and do change with greater education and awareness.[45]

Cultural practice does not warrant absolute respect, and article 12 of the aforementioned UNESCO declaration also has a Principle of Respect for Cultural Diversity which states:

The importance of cultural diversity and pluralism should be given due regard. However, such considerations are not to be invoked to infringe upon human dignity, human rights, and fundamental freedoms, nor upon the principles set out in this Declaration, nor to limit their scope.[42]

It is not easy to define what constitutes culture and the extent to which cultural diversities need to be respected. However, it seems clear that chewing the betel quid is not such an ingrained practice among the indigenous population. Given its peripheral nature and the dire health consequences, it is reasonable to argue that significant lowering the incidence of betel nut chewing is in conformity with safeguarding human dignity and rights.[46] However, cultural sensitivity is important in helping the at-risk population to cut back their habits.[47] One study shows that the official policies that emphasize only the scientific and medical aspects of betel nut are ineffective without corresponding initiatives that address the issue of cultural and ethnic identity.[48]

The recent attention given to environmental ethics also invites us to evaluate the likely damage betel palm plantations can cause on land and water conservation. Once again, the lack of greater foresight and the planning of land use can have disastrous effects on agriculture. The quick gain of a high-profit crop may cause long-term erosion that will take years to recover from. In fact, there is a greater awareness of the interconnectedness of environmental issues with the rest of human activities, combining bioethics, social ethics, business ethics, and ecology in an integral vision.[49]

In view of these bioethical concerns, we may consider the proper institutional response to betel nut consumption. One can rightly accuse the Taiwanese government for being negligent in not acting sooner and more decisively to reduce the trade and consumption habits. As we have seen in the history of the tobacco and alcohol trades, particular government agencies or officials may not be totally at fault because of the presence of complex forces and parties vying for their own interests. On this note, Bazerman and Tenbrusel have noted the tendency of institutions or decision-makers to ignore ethical “blind spots”, preventing them from acting objectively and based on a long-term projection. In the new discipline of behavioral ethics, they observe that human beings often behave irrationally and unknowingly act against their own ethical standards. These “blind spots” can occur at the individual, organizational, and societal levels.[50]

At the individual level, people often fall prey to psychological processes that bias their decisions. What is worse, most of the time they are unaware of the existence of these biases. They tend to make choices based on gut feelings that are not well thought out. Then, afterwards, they tend to see only the positive outcomes of their decisions while ignoring the negative effects. In this way, ethical principles are undermined time and time again due to a human tendency to justify one’s own actions.[51] At the organizational level, a phenomenon called “bounded ethicality” occurs. This means that by focusing only on certain decisions, one tends to neglect the ethical significance of other actions and is not consciously aware of their problematic nature. Employees or officials can contribute to dysfunctional organizations for fear of rocking the boat. Blind spots at the government level occur when decisions are taken which ignore the future consequences and focus only on immediate interests.[52] Bazerman and Tenbrusel gave the example of the crisis of overfishing the blue tuna. None of the countries can agree on the quota reduction in fishing, and because each country is only looking out for its own interests, the extinction of this fish and the eventual collapse of this industry seems inevitable. There is not just a lack of political will to make decisions in

accordance with the greater common good, but also limited views and vested interests that make these decisions appear to be the best when they are not.[50]

Time and time again, we have witnessed the phenomena of ethical blind spots. For instance, certain factions continue to maintain a sophisticated denial that smoking is related to lung cancer, or that alcohol and substance abuse can be detrimental to health. What has happened in the history of betel nut prevention in Taiwan is not very different. How can we avoid blind spots in ethical thinking and acting? By being cautious; by recognizing our blind spots, weaknesses, and tendencies; and by evaluating ourselves accurately. Traditional ethics calls for the virtue of prudence to overcome such potential blind spots through experience, self-knowledge, objectivity, and foresight at the individual level—but this is difficult to apply at the institutional level. The recent fields of behavioral economics and behavioral ethics are just making their inroads into bioethics, and will offer ample room for further reflections.[53]

This article is a first attempt to analyze the ethical dimension of this deadly habit. In spite of the fact that betel nut usage affects 10-20% of the world's population and that it is the fourth most popular psychoactive substance worldwide, not much ethical reflection on it can be found. Most people in the West have not heard of the betel nut, and the population at risk is often voiceless and faceless. We hope that this seminal paper can break the silence in the medical and bioethics community so that more scholars will look into this little-known quid that touches the lives of many.

References

- [1] S.-H. Chen, J.-M. Lee, H.-H. Liu, H.-C. Wang, and C.-Y. Ye, "The cross-effects of cigarette and betel nut consumption in Taiwan: have tax increases made a difference?," *Health Policy Plan*, vol. 26, no. 3, pp. 266–273, May 2011.
- [2] S.-E. Guo *et al.*, "Alcohol, betel-nut and cigarette consumption are negatively associated with health promoting behaviors in Taiwan: A cross-sectional study," *BMC Public Health*, vol. 13, no. 1, p. 257, Mar. 2013.
- [3] I. C. Wu *et al.*, "Interaction between cigarette, alcohol and betel nut use on esophageal cancer risk in Taiwan," *Eur. J. Clin. Invest.*, vol. 36, no. 4, pp. 236–241, Apr. 2006.
- [4] W.-C. Tsai *et al.*, "Chewing areca nut increases the risk of coronary artery disease in taiwanese men: a case-control study," *BMC Public Health*, vol. 12, no. 1, p. 162, Mar. 2012.
- [5] C.-F. Lin, J.-D. Wang, P.-H. Chen, S.-J. Chang, Y.-H. Yang, and Y.-C. Ko, "Predictors of betel quid chewing behavior and cessation patterns in Taiwan aborigines," *BMC Public Health*, vol. 6, no. 1, p. 271, Nov. 2006.
- [6] "How Dangerous Is Betel Nut?," *Healthline*. [Online]. Available: <http://www.healthline.com/health/betel-nut-dangers>. [Accessed: 07-Nov-2015].
- [7] S. Petti, M. Masood, and C. Scully, "The Magnitude of Tobacco Smoking-Betel Quid Chewing-Alcohol Drinking Interaction Effect on Oral Cancer in South-East Asia. A Meta-Analysis of Observational Studies," *PLoS One*, vol. 8, no. 11, Nov. 2013.
- [8] C.-H. Lee *et al.*, "Intercountry prevalences and practices of betel-quid use in south, southeast and eastern Asia regions and associated oral preneoplastic disorders: an international collaborative study by Asian betel-quid consortium of south and east Asia," *Int. J. Cancer*, vol. 129, no. 7, pp. 1741–1751, Oct. 2011.
- [9] P. C. Gupta and C. S. Ray, "Epidemiology of betel quid usage," *Ann. Acad. Med. Singap.*, vol. 33, no. 4 Suppl, pp. 31–36, Jul. 2004.
- [10] "Betel Nut Uses, Benefits & Dosage - Drugs.com Herbal Database." [Online]. Available: <http://www.drugs.com/npp/betel-nut.html>. [Accessed: 07-Nov-2015].
- [11] C. T. Lu *et al.*, "Prevalence and characteristics of areca nut chewers among junior high school students in Changhua county, Taiwan," *Community Dent Oral Epidemiol*, vol. 21, no. 6, pp. 370–373, Dec. 1993.

- [12] International Agency for Research on Cancer, “Betel-quid and Areca-nut Chewing and Some Areca-nut-derived Nitrosamines,” 2004. [Online]. Available: <http://monographs.iarc.fr/ENG/Monographs/vol85/index.php>.
- [13] S. Warnakulasuriya, C. Trivedy, and T. J. Peters, “Areca nut use: an independent risk factor for oral cancer,” *BMJ*, vol. 324, no. 7341, pp. 799–800, Apr. 2002.
- [14] M. J. Yang, T. C. Chung, M. J. Yang, T. Y. Hsu, and Y. C. Ko, “Betel quid chewing and risk of adverse birth outcomes among aborigines in eastern Taiwan,” *J. Toxicol. Environ. Health Part A*, vol. 64, no. 6, pp. 465–472, Nov. 2001.
- [15] 林昱廷, “檳榔對台灣經濟的影響。” [Online]. Available: <http://saturn.cksh.tp.edu.tw/~webadmin/site2/data/user/library/files/201005061435430.pdf>.
- [16] 陳昱安, “台灣口香糖—檳榔之探討。” [Online]. Available: http://saturn.cksh.tp.edu.tw/~webadmin/site2/data/user/library/files/201005061435430.pdf?_sm_au_=iVVfDJMt2QQ33tFs.
- [17] J. D. CHENG, J. P. LIN, S. Y. LU, L. S. HUANG, and H. L. WU, “Hydrological characteristics of betel nut plantations on slopelands in central Taiwan / Caractéristiques hydrologiques de plantations de noix de bétel sur des versants du centre Taïwan,” *Hydrological Sciences Journal*, vol. 53, no. 6, pp. 1208–1220, Dec. 2008.
- [18] Y. Sun, “Taiwan’s 60,000 Betel-Nut Beauties Thwart Effort to Curb Cancer.” [Online]. Available: http://www.bloomberg.com/apps/news?pid=newsarchive&sid=ahwT_eKoDVZo.
- [19] M. Kaye, “Betel Nut Explosions: The maturing of a Taiwanese drug culture and market.” [Online]. Available: <http://www.reed.edu/luce/documents/KayeLuceReport.pdf>.
- [20] I. Dolby, “The Betel Nut Sucker,” *ThingsAsian*, 28-Dec-2003. [Online]. Available: <http://thingsasian.com/story/betel-nut-sucker>.
- [21] Council of Agricultural, Executive Yuan, Taiwan, “檳榔問題管理方案 Management Plan for the Control of the Betel Nut Problem.” [Online]. Available: <https://www.google.it/url?sa=t&rct=j&q=&esrc=s&source=web&cd=2&cad=rja&uact=8&ved=0ahUK Ewj8p--mtLbJAhVCCw8KHevgAHQQFggoMAE&url=http%3A%2F%2Fws.ndc.gov.tw%2FDownload.ashx%3Fu%3DLzAwMS9hZG1pbmlzdHJhdG9yLzEwL3JlbGZpbGUvNTY4Ny80NzI4LzAwMjc2MDJfOC5wZGY%253D%26n%3DNTcyNjE2MjE1MTcxLnBkZg%253D%253D%26icon%3D.pdf&usg=AFQjCNEaER2-pc2AKRx97qUBVgXwaUFoqA&bvm=bv.108194040,d.bGQ>.
- [22] Council of Agricultural, Executive Yuan, Taiwan, “行政院農業委員會編訂:中華民國九十年十一月,” Nov-2011. [Online]. Available: <http://www.coa.gov.tw/view.php?catid=979>.
- [23] Council of Agricultural, Executive Yuan, Taiwan, “檳榔園廢園、轉作作業規範 Destroy betel nut farms and substitute for other use.” [Online]. Available: http://www.coa.gov.tw/show_%20news.php?cat=show_news&serial=9_diamond_20080108115251.
- [24] Council of Agricultural, Executive Yuan, Taiwan, “檳榔管理方案 Management Plan of the Betel Nut.” [Online]. Available: <http://www.coa.gov.tw/view.php?catid=20321>.
- [25] “好命自己拼：來穿檳榔葉 拖鞋紅回台 月賣百萬元,” 蘋果日報. [Online]. Available: <http://www.appledaily.com.tw/appledaily/article/finance/20150526/36570701/>. [Accessed: 06-Nov-2015].
- [26] The Oral Cancer Foundation, “Oral Cancer Facts.” [Online]. Available: <http://www.oralcancerfoundation.org/facts/>.
- [27] “Esophageal Cancer - Statistics,” *Cancer.Net*. [Online]. Available: <http://www.cancer.net/cancer-types/esophageal-cancer/statistics>. [Accessed: 07-Nov-2015].
- [28] S. Hsu, “Betel nut classes target curbing habit, preventing cancer - Taipei Times.” [Online]. Available: <http://www.taipeitimes.com/News/taiwan/archives/2014/04/19/2003588400>. [Accessed: 16-Nov-2015].
- [29] Control Yuan, Taiwan, “監察院全球資訊網—調查報告,” Jan-2013. [Online]. Available: http://www.cy.gov.tw/sp.asp?xdUrl=./di/edoc/eDocForm_Read.asp&ctNode=910&AP_Code=eDoc&Func_Code=t01&case_id=102000020. [Accessed: 07-Nov-2015].
- [30] Sunshine Social Welfare Foundation, “行政院輕忽檳榔致癌 防制工作事倍功半.” [Online]. Available: <http://www.sunshine.org.tw/SunTalk/TalkView.asp?STID=320>.

- [31] Department of Health, Taiwan, “兒童、青少年檳榔防制工作計畫 Education plan on Betel Nut Prevention for Children and Adolescents.” [Online]. Available: <http://cpd.moe.gov.tw/health/upload/files/1030711.pdf>.
- [32] “沒把檳榔管理好 行政院、農委會被監院糾正,” *ETtoday*. [Online]. Available: <http://www.ettoday.net/news/20130110/150971.htm>.
- [33] 李家同, “政府別再逃避責任! 李家同: 請關心勞動族健康, 檳榔加警語 | 名家 | 三立新聞網 SETN.COM.” [Online]. Available: <http://www.setn.com/ColumnNews.aspx?NewsID=30200>. [Accessed: 06-Nov-2015].
- [34] Brundtland G, “Reducing risks to health, promoting healthy life,” *JAMA*, vol. 288, no. 16, pp. 1974–1974, Oct. 2002.
- [35] E. Sgreccia, *Manuale di bioetica: 2, 4 edizione*. Milano: Vita e Pensiero, 2010.
- [36] P. J. Adams, S. Buetow, and F. Rossen, “Vested interests in addiction research and policy poisonous partnerships: health sector buy-in to arrangements with government and addictive consumption industries,” *Addiction*, vol. 105, no. 4, pp. 585–590, Apr. 2010.
- [37] “Let’s Be Straight Up about the Alcohol Industry,” *PLoS Med*, vol. 8, no. 5, May 2011.
- [38] K. Stenius and T. F. Babor, “The alcohol industry and public interest science,” *Addiction*, vol. 105, no. 2, pp. 191–198, Feb. 2010.
- [39] World Health Organization (WHO), “Framework Convention on Tobacco Control (FCTC).” [Online]. Available: <http://apps.who.int/iris/bitstream/10665/42811/1/9241591013.pdf>.
- [40] A. Sandford, “Government action to reduce smoking,” *Respirology*, vol. 8, no. 1, pp. 7–16, Mar. 2003.
- [41] M. Gracey and M. King, “Indigenous health part 1: determinants and disease patterns,” *The Lancet*, vol. 374, no. 9683, pp. 65–75, Jul. 2009.
- [42] UNESCO, “Universal Declaration on Bioethics and Human Rights,” 2005. [Online]. Available: <http://www.unesco.org/new/en/social-and-human-sciences/themes/bioethics/bioethics-and-human-rights/>.
- [43] J. Tham, A. Garcia, and G. Miranda, Eds., *Religious Perspectives on Human Vulnerability in Bioethics*, 2014 edition. New York: Springer, 2014.
- [44] T. L. Beauchamp and J. F. Childress, *Principles of Biomedical Ethics*. Oxford University Press, 2001.
- [45] S. W. Tracy and C. J. Acker, *Altering American Consciousness: The History of Alcohol and Drug Use in the United States, 1800-2000*. University of Massachusetts Press, 2004.
- [46] J. Tham, A. Garcia, and K. M. Kwan, *Religious Perspectives on Bioethics and Human Rights*, Springer. .
- [47] M. King, A. Smith, and M. Gracey, “Indigenous health part 2: the underlying causes of the health gap,” *The Lancet*, vol. 374, no. 9683, pp. 76–85, Jul. 2009.
- [48] 林富士, “試論影響食品安全的文化因素: 以嚼食檳榔為例,” 月旦法學知識庫, vol. 10, no. 1, pp. 43–04, Mar. 2014.
- [49] Pope Francis, “Encyclical Letter Laudato Si’ (On Care For Our Common Home).” 2015.
- [50] M. Bazerman and A. Tenbrusel, *Blind Spots: Why We Fail to Do What’s Right and What to Do about It*, 1 edition. Princeton: Princeton University Press, 2012.
- [51] M. Bazerman and F. Gino, “Behavioral Ethics: Toward a Deeper Understanding of Moral Judgment and Dishonesty,” Jan. 2012.
- [52] D. M. Messick and A. E. Tenbrunsel, *Codes of Conduct: Behavioral Research into Business Ethics: Behavioral Research into Business Ethics*. Russell Sage Foundation, 1996.
- [53] J. E. Miller, E. Amit, and A.-C. Posten, “Behavioral Economics,” in *Encyclopedia of Global Bioethics*, H. ten Have, Ed. Cham: Springer International Publishing, 2015, pp. 1–6.