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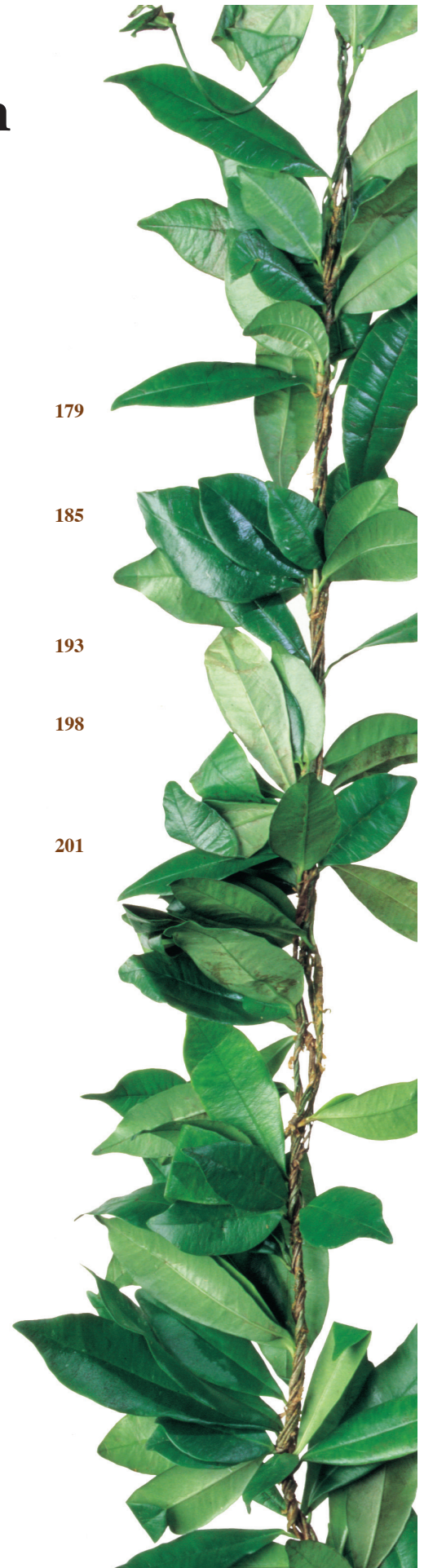
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The Current Use of *Sakau* (Kava) in Pohnpei Island, Federated States of Micronesia

Moeno Sakai MIS; Minato Nakazawa PhD

Abstract

In Pohnpei Island, *sakau* (kava) is a symbol of the traditional culture. Although the use of *sakau* was once limited to people of high rank and used only during ceremonial occasions, it is now consumed in bars and sold in bottles around the island. Recently, negative medical and environmental effects correlated with the increase sale of *sakau* have attracted scholarly attention. However, the current use of *sakau* is not fully understood. This study aims to describe the current use of *sakau* and consider by whom, on what occasions, and for what purpose *sakau* is consumed, and whether it continues to play a traditional role. Fieldwork was conducted from July to September 2019 in Kolonia (where people of Pohnpeian ethnicity live) and Mand (where non-Pohnpeians live). The latter was included to investigate whether *sakau* was consumed by people of ethnic groups that have never used it traditionally. Data were collected via interviews using a questionnaire, direct observation, and casual conversations. A total of 89 people (41 in Kolonia; 48 in Mand) participated in the study. Most (71% of those in Kolonia and 58% of those in Mand) reported they drank *sakau* at some point in their lives. Although the frequency of *sakau* consumption was significantly lower in Mand ($P=.027$), it was consumed regardless of their original culture. Commonly reported reasons for drinking *sakau* included treating anxiety and socializing. The use of *sakau* in Pohnpeian society continues in traditional contexts, such as feasts, marriage proposals, and forgiveness. Additionally, increased consumption has been profitable for people engaged in businesses related to *sakau*.

Keywords

Piper methysticum, kava, *sakau*, Pohnpei Island, Micronesia

Introduction

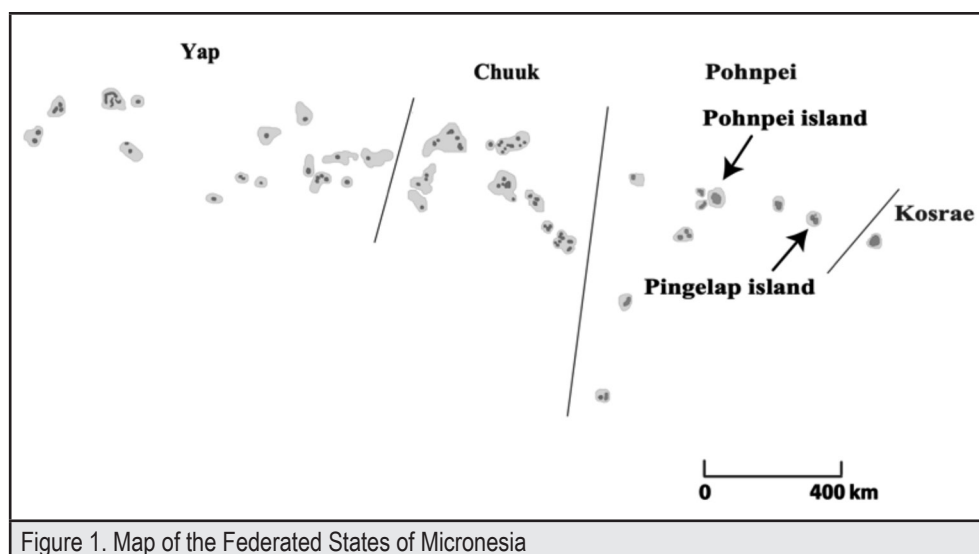
Piper methysticum is a robust, succulent, well-branching, erect, perennial shrub belonging to the *Piperaceae* family. The succulent thrives at altitudes between 150 m and 300 m above sea level and grows well in upland forests when cultivated and in the wild.¹⁻⁴ In the Pacific Islands, the root of the plant is used to make a beverage called kava, *kavakava*, or *kawa*. Kava does not contain alcohol but has an intoxicating, calming effect, and promotes a sense of sociability.^{1,2,5,6} Historically, preparing and distributing kava were highly ritualized. Drinking kava was permitted only among royalty and priests during social, ceremonial, and religious occasions, and drinking was unacceptable for women. In addition, kava was used for connecting to gods and for medicinal purposes.^{1-3,5,7}

However, the pattern of kava use has markedly changed over several decades, and its consumption is no longer restricted. Today, people drink in kava bars, where it is served in individual cups. Moreover, people can buy fresh, dried, or powdered kava

especially in urban areas.^{6,8-10} In Vanuatu, the sale of kava became a big business in the mid-1980s, after this South Pacific Island nation's independence from France. Consequently, kava use has become ubiquitous in Vanuatu. This increased use was partly a response to increased beer and wine prices, but also held political meaning, in that kava was one of the main ways to express regional identity in independent Vanuatu.¹¹ In Fiji, kava (*yagona*) is typically consumed in the privacy of homes, while it is still used in festive ceremonial events.¹²

With its increased availability, the harmful effects of kava have gained scholarly attention. Dermopathy, a skin condition characterized by drying and scaling, is commonly observed among heavy drinkers.^{2,9,13,14} Kava causes liver damage and elevated γ -GTP liver enzyme levels.^{13,15-18} Drinking kava is associated with other unhealthy lifestyle behaviors, such as smoking, alcohol consumption, and unhealthy food consumption, which are risk factors for non-communicable diseases.^{18,19} Previous studies reported the negative effect of kava on employment due to decreased motivation resulting from kava use, and that time and money spent on drinking kava led to conflict among family members and/or the community.^{9,19,20}

In Pohnpei Island, which is one of the islands in Pohnpei State of the Federated States of Micronesia (Figure 1), kava is called *sakau*; in this study, the authors refer to *sakau* in the context of kava in Pohnpei. James F. O'Connell, the first westerner to stay in Pohnpei, reported that *sakau* was consumed in the island during the 1830s.²¹ *Sakau* is a symbol of the traditional culture of the island. According to Pohnpeian folklore, *sakau* was a gift from the gods. The coconut shell in which *sakau* is consumed is on the state flag and on the official seal of the governor of Pohnpei.²² *Sakau* is made by pounding the root on a special stone, mixing it with water, and squeezing sap from the hibiscus plant. *Sakau* is distinguished from kava consumed in other islands by the thick, slimy consistency provided by the hibiscus sap.⁴ Similar to other Pacific Islands, the consumption of *sakau* was limited to people of high rank and men, and was not for personal enjoyment. During feasts, *sakau* was distributed from high-ranking to lower-ranking individual using coconut shell cups. The act played a significant role in positioning social hierarchy and confirming social structure in communities. *Sakau* was also used for soliciting forgiveness from another family or when asking a father for his daughter's hand in marriage. Owning pigs, yams, and *sakau* was considered a special symbol of wealth, different from having large amounts of money.^{4,7,23-28}



Between 1960 and 1990, Pohnpei shifted into a new cash-based economy due to the dramatically increased subsidies from the US following the signing of the Compact of Free Association. The employment policy expanded the number of salaried employees. The people left behind by this employment began to run businesses related to *sakau* to earn money. The first *sakau* bar was opened in the early 1970s and since then, the number of *sakau* bars and retail stores significantly increased through the 20th century. During this period, the number of people engaged in businesses related to *sakau* increased to approximately 15% of the population. *Sakau* began to be prepared in bins or plastic bottles called “market *sakau*” and sold in plastic coolers along roadsides and parking lots.^{4,22,23,29–31} This increase in *sakau* production damaged the environment. More than 70% of previously intact native forests have been degraded from increased cultivation of *sakau* since 1975.²³ Problems related to health and social relationships have also emerged from increased *sakau* use.^{4,25}

Thus, the use of *sakau* has become complicated.^{4,23,25} Few studies have reported the current use of *sakau* in Pohnpei. It is unclear who uses *sakau*, on what occasions, and for what purposes. It is unclear whether it continues to play its traditional roles. This study aims to describe the current use of *sakau* from these perspectives.

Methods

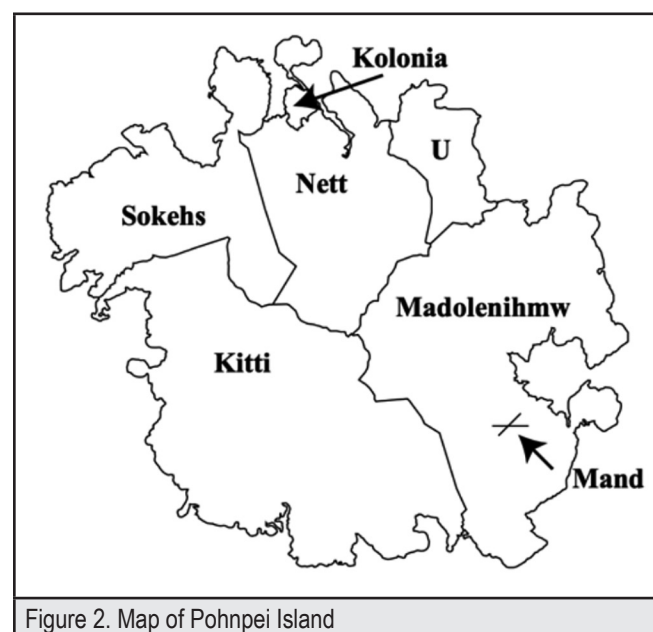
Study Site

Pohnpei Island consists of 6 municipalities (Figure 2). One study site was Kolonia, the state capital of Pohnpei, where the majority of commercial and public facilities are located. The second site was Mand, a small community in the Madolenihmw municipality. Drinking *sakau* is not part of the traditional

culture in Mand because its people originated from Pingelap Island (Figure 1). Pingelap Island maintains its own language and culture, and does not have a culture of using *sakau* due to its environment (atoll), which is unable to grow *sakau*.⁵ This Pingelapese population was included to investigate whether *sakau* is now consumed by people who never used it traditionally. According to the latest census,³² the populations of Kolonia and Mand are 6074 and 459, respectively.

Data Collection

Fieldwork was conducted from July to September 2019 by one of the authors and research assistants who were fluent in English and local languages. Different sampling methods were applied



in the 2 regions because independent sampling for an ongoing survey in Kolonia was not allowed. In Kolonia, the Department of Public Health in Pohnpei State recruited participants by simple random sampling for the survey, and 50 individuals were selected for this study. In Mand, 50 households were randomly selected from lists of residents drawn up by a research assistant. Then one person from each household was selected via the Kish method.³³ Because only Pohnpeians and Pingelapese were included in this study, the numbers of the participants were 41 and 48 from Kolonia and Mand, respectively. Data were collected through face-to-face interviews using a questionnaire which included demographic information and items on the current use of *sakau*. The author also collected information related to *sakau* through casual conversations with residents and recorded field notes. Direct observation was conducted in places where *sakau* was consumed not only in Kolonia and Mand but throughout Pohnpei Island (eg, *sakau* bars, feasts, roadsides).

Statistical Analysis

All statistical analyses were performed using R software version 4.0.2 (R Foundation for Statistical Computing, Vienna, Austria).³⁴ The gender and regional differences were assessed using t-tests (continuous variables) or Fisher's exact test (categorical variables). The statistical significance was set at *P* value <.05.

Ethical Approval

This study was approved by the ethical committee of the Graduate School of International Cooperation Studies in Kobe University and the Department of Health and Social Affairs in Pohnpei State. Written informed consent was obtained from all participants.

Results

Table 1 summarizes the demographic information of the participants. A total of 89 people (36% men) participated in this study. The means and standard deviations of the ages of the participants were 38.8 ± 14.4 and 39.1 ± 15.3 in Kolonia and Mand, respectively. Table 2 summarizes the current use of *sakau*. There were no significant differences in gender nor region of residence in the percentage of the participants who had consumed *sakau* at some point in their life. Significantly more participants in Kolonia (76%) drank *sakau* more than once a week than those in Mand (50%; *P* = .027).

Of those who had consumed *sakau* (hereafter referred to as *sakau* drinkers), 76% in Kolonia and 89% in Mand responded with "after dinner" or "before going to bed" for the occasions to drink. In Kolonia, 28% and 7% in Mand drank *sakau* on special occasions, such as feasts, funerals, and wedding ceremonies.

Field notes revealed further observations of *sakau* use in both traditional and non-traditional contexts. In one instance, the author observed *sakau* use for obtaining a woman's parents' permission to marry in a Pohnpeian household in Kitti municipality (see Figure 2). *Sakau* was prepared by men in the groom's family by the traditional pounding method and served in a coconut shell cup by a member of the groom's family to the woman's father. The father drank from the cup, indicating agreement with the marriage. The use of *sakau* in feasts was also observed in U municipality (see Figure 2), which was also prepared in the traditional way and distributed by high-ranking people. During a casual conversation, a Kolonia woman in her 60s related a story of using *sakau* as a means

Table 1. Participant Demographics					
	Kolonia (N = 41)		Mand (N = 48)		P-value*
	N	(%)	N	(%)	
Gender					
Men	13	(32)	19	(40)	.50
Women	28	(68)	29	(60)	
Age (years)					
Mean ± SD	38.8 ± 14.0		39.1 ± 15.3		.92
Ethnicity					
Pohnpeian	41	(100)	0	(0)	-
Pingelapese	0	(0)	48	(100)	
Employment Status					
Unemployed	19	(46)	18	(38)	.52
Employed	22	(54)	30	(63)	
Personal Income (US \$/2 Weeks)					
Less than \$100	22	(54)	35	(73)	.045
More than \$100	19	(46)	12	(25)	
do not know	0	(0)	1	(2)	

* difference between Kolonia and Mand using t-tests and Fisher's Exact test

Table 2. Survey Result on Current Use of <i>Sakau</i> in Kolonia and Mand					
	Kolonia (N = 41)		Mand (N = 48)		<i>P</i> -value*
	N	(%)	N	(%)	
Experience with Drinking <i>Sakau</i>					
Yes	29	(71)	28	(58)	.27
No	12	(29)	20	(42)	
Frequency of Drinking <i>Sakau</i>					
Everyday	2	(7)	0	(0)	.017
> once a week	20	(69)	14	(50)	
> once a month	4	(14)	13	(46)	
< once a month	3	(10)	1	(4)	
Occasions for Drinking <i>Sakau</i> (Multiple)					
During meal time	0	(0)	0	(0)	-
After having dinner/ Before going to bed	22	(76)	25	(89)	.30
When drinking alcohol	1	(3)	2	(7)	.61
Special occasions	8	(28)	2	(7)	.079
Others	1	(3)	0	(0)	1
Mode of Obtaining <i>Sakau</i>					
Always make at home	3	(10)	1	(4)	.015
Buy/Make at home	11	(38)	21	(75)	
Always buy market <i>sakau</i> or drink in <i>sakau</i> bars	15	(52)	6	(21)	
Reasons for Drinking <i>Sakau</i> (Multiple)					
To relieve anxiety	11	(38)	15	(54)	.29
I like that taste	0	(0)	11	(39)	<.001
To gain courage	0	(0)	4	(14)	.052
I am accustomed to it	5	(17)	3	(11)	.70
Influence of friends/family	3	(10)	2	(7)	1
Influence of traditional	4	(14)	1	(4)	.35
To fall asleep easily	6	(21)	2	(7)	.25
Others	1	(3)	0	(0)	1
Expense for <i>Sakau</i> (US\$/2 Weeks)					
< 20	15	(52)	27	(96)	<.001
> 20	13	(45)	1	(4)	
Unsure	1	(3)	0	(0.0)	

* difference between Kolonia and Mand using Fisher's Exact Test

of asking of forgiveness. According to her, a man accidentally hit and injured his wife's uncle couple years ago. During his parole, the man prepared *sakau* for the relatives of the victim. At first, they refused to drink but eventually accepted his offer to drink after several attempts, which indicated forgiveness. On the other hand, 2 women in Kolonia stated that they drank *sakau* before sexual intercourse, which has not been reported in previous studies.

In regard to the mode of obtaining *sakau*, significantly more *sakau* drinkers in Kolonia (52%) responded that they "always buy market *sakau* or drink in *sakau* bars" than in Mand (21%,

$P=.015$). In casual conversation with women in Mand, one of them stated, "We prefer to make *sakau* by ourselves because market *sakau* and *sakau* bars are expensive and contain too much water, so we need to spend a lot of money to feel the *sakau* and be relaxed."

In terms of reasons for drinking, 38% of *sakau* drinkers in Kolonia and 54% in Mand indicated they drank to relieve anxiety. A few persons in Mand (4%) referenced drinking for traditional reasons. In Mand, 4% drank "to gain courage," whereas in Kolonia none did. Also, in Mand 39% responded "because I like that taste"; however, when the author drank *sakau* with villagers

in Mand, they instructed the author to “drink beer or soda, eat something like candy, snack, or chocolate, chew betel nut soon after drinking *sakau* to get rid of the taste.” Other reasons for drinking identified during conversations included “for socializing,” “for talking with people while drinking *sakau*,” and “for drinking even without money.” These were reported in both Kolonia and Mand. A man in Kolonia in his 40s stated, “when we do not have money, others pay for me, and when others do not have money, we would pay. So, we could drink *sakau* even when we do not have money and we could always drink *sakau* with many people.” Ninety-six percent of the *sakau* drinkers in Mand spent less than \$20 US every 2 weeks on buying *sakau*, while 45% of the drinkers in Kolonia spent more than \$20 US every 2 weeks ($P < .001$). Participants reported that market *sakau* was priced around \$6 US per 1000 ml, that *sakau* bars were relatively expensive, and that the price was rising along with the increasing demand. A Kolonia man in his 60s said, “Recently, many people spend too much money for *sakau*. They end up wasting money and could not afford to buy food or any educational tools for their families.” Conversely, the increased demand for *sakau* was beneficial for others. Villagers reported that people engaged in the *sakau* business earned more than government employees did. A woman who sold market *sakau* in Kolonia as a family business reported her monthly sales of *sakau* totaled approximately \$7000 US.

Discussion

This study aimed to describe the current use of *sakau* in Pohnpei and consider by whom, on what occasions, and for what purposes *sakau* is consumed, and whether it continues to play a role in traditional ceremonies.

There is increased sale of *sakau* outside homes, along with widened use of *sakau*. Although *sakau* use in the past was strictly limited to those with high rank or men,⁴ the findings indicate that *sakau* is now consumed regardless of gender. The results from Mand indicate *sakau* is consumed by people who never used it traditionally, although the frequency of *sakau* consumption is lower than in Kolonia. This difference in consumption frequency and alternate modes of obtaining *sakau*, may be reasons for the lower cost of *sakau* in Mand. Limited places where people can easily buy *sakau* in Mand, along with significantly lower personal incomes, may be other contributing factors. The observation that *sakau* is prepared and consumed even by those without a cultural history of drinking *sakau* has also been observed with kava. Currently, kava is consumed by populations that did not drink it in the past, such as the Aboriginal community in Australia, the Maoli community in New Zealand, and in Kiribati.^{2,35–37}

Although *sakau* is still used in traditional contexts, such as feasts, asking for forgiveness, and asking for a woman’s hand in marriage (*sakau en pahnta*) in Pohnpeian society, only a minority reported that they did so. The practice of reserving the drink for people with high rank during special occasions may

be one reason for this.^{4,23} As the traditional culture of Pingelap Island does not use *sakau*,⁵ it was not surprising that only 2 participants reported drinking *sakau* on such occasions in Mand.

More frequently, despite not liking the taste, respondents reported using *sakau* in everyday life, such as for the treatment of anxiety. Laboratory experiments have demonstrated that kava extract has a hypnotic effect and enhances sleep quality.³⁸ It may regulate physiological reactions during stress due to its sedative, analgesic, anticonvulsant, and local anesthetic effects.^{39,40} Exported kava from the Pacific Islands is used as a source of pharmaceutical compounds and supplements sold in drug stores in several countries.^{2,7} A previous study reported that the primary reason for drinking *sakau* was socializing,⁴ which is consistent with the results from this report. In addition, *sakau* was reportedly always consumed with others, which may be interpreted as a type of socializing and how respondents “can drink without money.” In 1941, Imanishi noted that any passerby in Pohnpei could receive food from and join the gathering of any villager and this custom is still observed to this day.²⁷

The participants reported both negative and positive economic consequences from widened *sakau* use. One participant called *sakau* a waste of money, a sentiment shared by people in other countries.^{9,14,20} However, given that more than half the participants earned incomes of less than \$100 US per 2 weeks, a monthly *sakau* sale of \$7000 US is a lucrative business. Demand has increased, not only domestically, but also internationally. Pounded and frozen roots and liquid extract of *sakau* are exported to Guam, Saipan, Hawai‘i and other US states, and consumed by migrants from the island.²³ This phenomenon is not unique to Pohnpei, as other Pacific Islands also export kava for migrants living in developed countries.^{2,7} The increased demand for *sakau* has changed the *sakau* business, which was once the only method for earning cash among the underprivileged,^{23,31} to that of a highly profitable business venture.

Limitations

This study is limited by the relatively small sample size, and may not be representative of the Pohnpei population. The span of fieldwork was short and the results may not fully cover other aspects of everyday life and traditional events. The structured questionnaire may have limited participant responses. Finally, the study may have overlooked the views of people who do not drink *sakau*.

Conclusion

Currently, *sakau* is consumed in Pohnpei for treating anxiety and socializing, regardless of gender and original culture. This widespread use has been profitable for people engaged in the *sakau* business and for the country’s economy. *Sakau* continues to play a traditional role in the Pohnpeian society.

Conflict of Interest

The authors declare no conflict of interest.

Disclosure Statement

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Gestational Diabetes Mellitus Prevalence, Screening, and Treatment Practices in American Samoa, 2016

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Abstract

Gestational diabetes mellitus (GDM) is a serious pregnancy complication and understudied public health issue in American Samoa. The goals of this study were to (1) estimate the prevalence of GDM in American Samoa, (2) evaluate current screening practices for GDM, and (3) evaluate obtainment of GDM treatments in 2016. This cross-sectional study used 3 data sources: electronic health records, a labor and delivery logbook, and the American Samoa Department of Health (ASDOH) Maternal and Children's Health (MCH) Postpartum database. Out of 995 women with a singleton birth in American Samoa during the study period, 60.1% (n=598) completed a glucose tolerance test for GDM. Of these women, 41.8% (n=250) completed the testing within the recommended 24-28 weeks gestation timeframe. The estimated prevalence of GDM was 14.0% (95% confidence interval: 11.2-16.8) but has many limitations due to missing data. There were 4 treatments analyzed: nutrition counseling, insulin, metformin, and diabetes counseling. Of all women diagnosed with GDM (n=84), 76% were prescribed any of the 4 treatments. However, only 52% of those women obtained the treatment prescribed. Access to testing and treatment needs to be expanded to provide adequate prenatal care to women in American Samoa.

Keywords

Gestational diabetes, diabetes, female, pregnancy, American Samoa, prenatal care

Abbreviations

ASDOH = American Samoa Department of Health
BMI = body mass index
CHC = community health center
HER = Electronic health records
GDM = Gestational diabetes mellitus
L&D Log Book = Labor and delivery log book
LBJ = Lyndon B. Johnson Tropical Medical Center
MCH = Maternal and children's health
NCD = Non-communicable disease
OGTT = Oral glucose tolerance test
PNC = Prenatal care

Introduction

Gestational diabetes mellitus (GDM) is glucose intolerance that was not present or recognized prior to pregnancy.¹ Women with excessive gestational weight gain, family history of type 2 diabetes, or obesity have increased risk for GDM.^{2,3} Women with GDM are at increased risk for future urinary tract infections, pre-eclampsia, and type 2 diabetes.⁴ Children born to mothers with GDM have an increased risk of adverse birth outcomes

such as macrosomia (high birth weight [$>4000\text{g}$]), shoulder dystocia, neonatal hypoglycemia, and cesarean deliveries.^{4,5} Children born to mothers with GDM have an increased risk of obesity, insulin resistance, and impaired motor function later in childhood.^{4,5}

These chronic diseases and other non-communicable diseases (NCD) disproportionately occur in low- to middle-income countries. The Pacific Islands, in particular, have a high NCD burden and lower capacity to manage these conditions.⁶ This causes increased concern surrounding the effects of obesity and diabetes on maternal and child health.

American Samoa is a Pacific Island territory of the United States (US) with one of the highest NCD burdens in the world.^{6,7} Located 2600 miles southeast of Hawai'i, American Samoa consists of 7 islands including the main island of Tutuila, home to the majority of the population (approximately 60 000 residents).⁸ About 58% of families have incomes below the US poverty line and face issues with provisions of health care like many other Pacific Island jurisdictions.⁹ The Lyndon B. Johnson Tropical Medical Center (LBJ) and 7 community health centers (CHCs) offer health services including prenatal care.

The most recently published analysis of mortality and morbidity data in American Samoa from 2018 revealed the leading causes of death are malignancy, followed by diabetes and heart disease.¹⁰ More specifically, 93.5% of adults in American Samoa are overweight or obese and 33.6% have diabetes.¹⁰ In the US, Pacific Islander women are at an increased risk of developing GDM compared to non-Hispanic White women.¹² Given the high prevalence of overweight/obesity and diabetes in American Samoa, and higher risk for developing GDM among Pacific Islander women in the US, GDM is an issue that should be investigated in American Samoa.

Despite these increased risk factors, the prevalence of GDM in American Samoa is still unknown. Multi-ethnic studies have suggested that the global incidence of GDM among Pacific Islanders is 9.9%-14.8%, which is relatively high compared to an estimated GDM prevalence of 2%-6% among European ethnic groups.^{12,13} Previous research has examined GDM prevalence and screening rates in American Samoa. However, barriers to adequate prenatal care and healthcare documentation have limited research thus far.^{11,14} In an evaluation of records by Hawley, et al, in 2014, 85.4% of women in American Samoa

received inadequate prenatal care.⁹ Factors such as parity, unemployment, and lack of knowledge about prenatal care limited women's access to services.⁹ Based on data collected from 2008-2009, 16.1% of women received adequate GDM screening in American Samoa.¹⁵ Consequently, current screening rates, prevalence of GDM, and treatment outcomes are still unknown in this high-risk population.

Due to the established high prevalence of risk factors for developing GDM and lack of adequate prenatal care, GDM is an important area of public health concern in American Samoa. The goals of this study were to (1) estimate the prevalence of GDM in American Samoa, (2) evaluate current screening practices for GDM, and (3) evaluate initiation and receipt of GDM treatments in American Samoa.

Methods

Data Collection

This was a cross-sectional study of women who gave birth in American Samoa from January 2016 through December 2016. Data sources included the labor and delivery logbook (L&D logbook) from the LBJ Tropical Medical Center, patient records from the electronic health records (EHR) system, and the American Samoa Department of Health (ASDOH) Maternal and Children's Health (MCH) Postpartum database.

The L&D logbook was the primary data source for all women who gave birth in 2016. Patients who give birth at LBJ or were evaluated there after a home birth (very rare) have data entered

into the EHR and further documented into the paper logbook located at LBJ in the Labor and Delivery Department. The appendix contains a complete list of variables from this data source. The second data source was the MCH Postpartum database. This is a record of women who gave birth in 2016 that was collected by the ASDOH MCH program. Nursing staff at the LBJ nursery complete cards documenting mother and baby prenatal care information. MCH staff collect these cards weekly to create this database. These data were collected for all mothers who gave birth in 2016.

The third data source was the EHR system. The EHR system, implemented in 2015, is the primary health records system used by the CHCs and LBJ. All patient records prior to 2015 were collected via a separate database.

All 3 data sources were merged using maternal hospital ID numbers (Figure 1). The data set was merged by the primary author (Meyer) and verified by checking maternal first and last name and date of delivery by a second author (Ropeti). Maternal date of birth was not used to verify because this variable was missing from the labor and delivery logbook. Therefore, the authors could not verify across all 3 data sources. Though a rare occurrence, these data sources do not include women who had home births and did not receive medical care at LBJ. These merged data were de-identified prior to analysis by removing the hospital ID numbers and patient names. After data sources were merged, an EHR individual patient systematic record review was performed to collect missing variables and confirm EHR data that were entered in the L&D logbook.

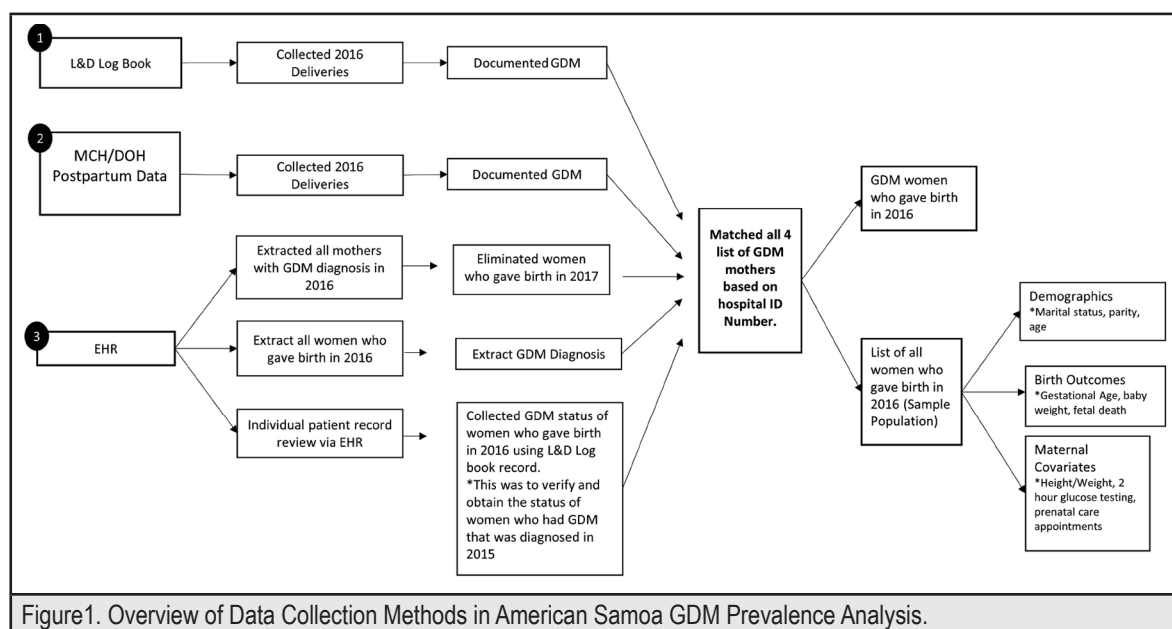


Figure1. Overview of Data Collection Methods in American Samoa GDM Prevalence Analysis.

Abbreviations: L&D= Labor and Delivery, MCH = Maternal and Childrens Health, DOH= Department of Health, EHR= Electronic Health Records, GDM = Gestational Diabetes Mellitus

Sample

Data were available for 1016 women. Women who were identified in the MCH Postpartum database but not identified as having given birth in 2016 by either the EHR system or L&D logbook were excluded from this study (n=2). Women with multiple births; defined as twin or triplet births, were excluded (n=3).

Screening and Prevalence Estimates

American Samoa LBJ GDM screening protocols follow recommendations outlined by the American Diabetes Association. Pregnant women are screened using fasting blood glucose or HbA1c test followed by a confirmatory 2-hour 100g glucose tolerance test (GTT) at 24-28 weeks gestational age.¹

The EHR was reviewed to determine if a woman received a GTT. Gestational age was determined based on a woman's last menstrual period and obstetric measures. This dataset did not include that information but did include the gestational age at birth and date of birth. Approximate gestational age at which the GTT was performed was determined by counting back the number of weeks from the approximated gestational age at delivery to the date of the GTT. Women were identified as being tested within the recommended 24-28 weeks if the date of the completed lab test was within their calculated timeframe.

GDM diagnosis was defined as any a positive GTT diagnostic for GDM, documented in any of these 3 data sources. Women who had a GTT that was negative for GDM were categorized as having no GDM (Figure 1). The prevalence of GDM was estimated among women who had GDM testing, did not have preexisting type 2 diabetes, and gave birth in 2016.

Treatment Analysis

Four GDM treatments were analyzed for both prescription and obtainment of treatment: prescription of metformin, prescription of insulin, nutrition counseling, and diabetes education. Women could have received more than 1 type of treatment. EHR patient and pharmacy records were reviewed to determine treatment outcomes. Women prescribed metformin or insulin after the date of GDM diagnosis were determined to have been prescribed the treatment. Women were classified as having obtained the treatment if their EHR pharmacy records indicated a "completed" or filled prescription. Nutrition counseling is provided by LBJ registered dietitians. Women who were referred for nutrition counseling after the date of GDM diagnosis were determined to have been prescribed the treatment. They were classified as having obtained treatment if their EHR records contained a completed nutrition consultation form. The diabetes education program, provided by ASDOH, is provided to patients who are diagnosed with type 2 diabetes or GDM. Patients were identified as being referred to and attending the program as indicated in their EHR.

Demographic Variables

Variables collected included: mother's age at delivery, number of prenatal care (PNC) visits, gestational age at delivery, date of delivery, gravida, marital status, GDM status, and all glucose tolerance test results. Age was dichotomized based on the classification of advanced maternal age at 35 years or older. At the time of data collection there were no indicators of income or education status for patients in the clinical records. BMI status was dichotomized based on classification of normal weight BMI <25 or overweight/ obese BMI ≥25. Marriage was dichotomized as married or not married. Not married was defined as divorced, never married, or widowed. Gestational age at delivery was considered preterm if <37 weeks or full-term if ≥37 weeks at delivery. Prenatal care was dichotomized as having prenatal care if there was 1 or more prenatal care appointments documented and not having prenatal care if there were 0 documented prenatal care appointments.

Data Analysis

The prevalence of GDM was estimated among women who gave birth in 2016, acquired GDM testing and did not have pre-existing type 2 diabetes. Descriptive statistics were used to describe the final dataset of women. Chi-squared tests identified differences in demographic factors between women with and without GDM. The data analysis for this paper was generated using SAS software Version 9.3 (SAS Institute Inc., Cary, NC).

Ethics

Institutional Review Board (IRB 00001249, FWA 00024252) approval was obtained by the American Samoa Department of Health along with approval from the LBJ Tropical Medical Center and the American Samoan Department of Health Maternal and Children's Health Program. None of the authors identify any conflict of interest.

Results

Sample Summary

Out of 1011 women who had a singleton birth in American Samoa in 2016, 16 women had a previous diagnosis of type 2 diabetes and were therefore excluded from analysis. Among the 995 women included in the analysis, the mean age was 26.4 years, and 14.5% were 35 years or older (Table 1). The majority of women (53.1%) with a recorded BMI were overweight or obese (BMI ≥25). The mean gestational age at delivery was 39.2 weeks, and 7.3% of all births were pre-term. The mean gravida was 3.2, with 25.4% of women delivering gave birth to their first child. More than half (56.1%) of women were classified as married. The mean number of prenatal appointments was 7.9, and 8.7% of women delivering did not receive any prenatal care.

Table 1. Sample Demographics for Women Who Gave Birth in American Samoa in 2016, by GDM Status.				
Characteristic	Total Sample N (%)	GDM Status		Test of Association
		GDM N (%)	No GDM N (%)	
Age				
Mean Age (years)	26.4	26.4	26.4	$\chi^2= .007$ $P = .068$
<35 years	850 (85.4)	54 (5.4)	796 (80.0)	
≥ 35 years	145 (14.5)	30 (3.0)	115 (11.5)	
BMI				
BMI <25	67 (46.9)	2 (1.3)	65 (45.5)	$\chi^2=4.79$ $P = .029$
BMI >25	76 (53.1)	10 (7.0)	66 (46.1)	
Missing values	852			
Marital Status				
Married	541 (56.1)	57 (5.9)	484 (50.2)	$\chi^2= <.001$ $P = .010$
Not Married	422 (43.2)	17 (1.8)	405 (42.1)	
Missing values	32			
Gestational Age at Delivery				
Mean age at delivery (weeks)	39.2	39.1	39.2	$\chi^2 = .304$ $P = .419$
Preterm	71 (7.3)	14 (1.4)	57 (5.8)	
Full-term	908 (92.7)	69 (7.1)	839 (85.7)	
Missing Values	16			
Gravida				
Mean	3.2	3.3	2.5	$\chi^2 = .018$ $P = .109$
1	253 (25.4)	12 (1.2)	241 (24.2)	
>1	741 (74.5)	71 (7.1)	670 (67.4)	
Missing Values	1			
Prenatal Care				
Mean number of appointments	7.9	8	7.9	$\chi^2=.175$ $P = .324$
Prenatal Care	908 (91.2)	80 (8.0)	828 (83.2)	
No Prenatal Care	87 (8.7)	4 (0.4)	83 (8.3)	
Total	995	84 (8.4)	911 (91.5)	

Note: Columns may not sum to total due to missing data

Abbreviations: GDM = Gestational Diabetes Mellitus, BMI= Body Mass Index

Screening Practices

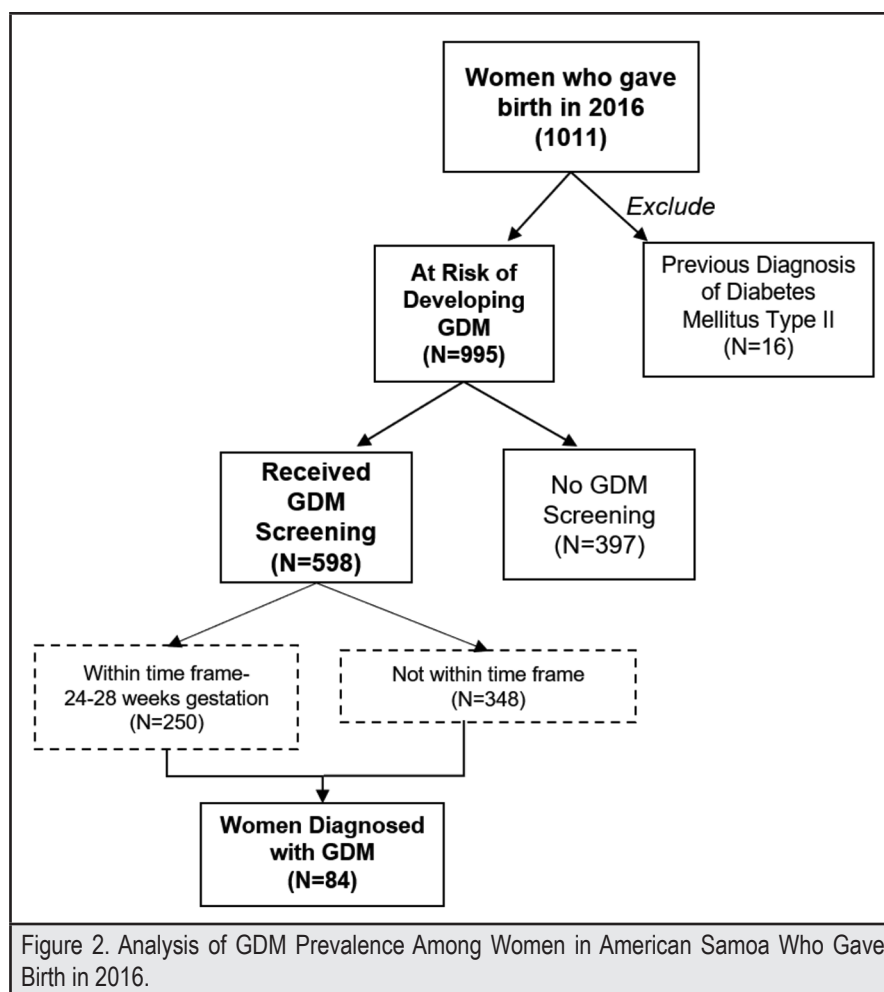
In 2016, 598 (60.1%) out of 995 women completed a 2-hour OGTT during their pregnancy (Figure 2). Among those women who completed a 2-hour OGTT during their pregnancy, 250 (41.8%) completed the 2-hour OGTT within the recommended 24-28 weeks gestation. It should be noted that of the 16 women who had a previous diagnosis of type 2 diabetes, 5 were still screened for GDM, even though their previous diagnoses should have excluded them from this test.

Prevalence of GDM

Out of 598 women who gave birth in 2016 who were screened for GDM and did not have pre-existing type 2 diabetes, 84 (14.0%, 95% confidence interval [CI]: 11.2%-16.8%) were diagnosed as having GDM (Figure 2).

Treatment Adherence

Of the 84 women diagnosed with GDM, 53 (63%) were prescribed the diabetes education program, however, none attended the program (Table 2). Forty-three women (51%) were prescribed nutrition counseling. This treatment had the highest attendance at 61%. Seven (8%) women were given an insulin prescription, but only 2 (29%) of those women obtained the prescription. Ten (12%) women were prescribed metformin, and 5 (50%) of them obtained the prescription. Out of the 84 women diagnosed with GDM, no woman obtained diabetes education, 31% obtained nutrition counseling, 2% obtained insulin, and 6% obtained metformin. Out of all women diagnosed with GDM, 64 (76%) were prescribed any treatment and 33 (52%) of those who were prescribed a treatment obtained at least 1 treatment (Table 2).



Abbreviation: GDM= Gestational Diabetes Mellitus

Treatment	Women Prescribed Treatment	Women Who Obtained Treatment
	N (% of Total Women with GDM)*	N (% of Number of Women Prescribed Treatment)**
Any treatment	64 (76)	33 (52)
Diabetes education	53 (63)	0 (0.0)
Nutrition Counseling	43 (51)	26 (61)
Insulin	7 (8)	2 (29)
Metformin	10 (12)	5 (50)

* Total Women with gestational diabetes mellitus (GDM) = 84. ** Women could have received more than 1 type of treatment.

Discussion

The prevalence of GDM in American Samoa was estimated to be 14.0% (95% CI: 11.2%-16.8%) in 2016. Approximately 2%-10% of pregnancies in the US are affected by GDM.¹⁶ In the Pacific, the most recently estimated prevalence of GDM was 5.5% in the Republic of Palau.¹⁷ The global prevalence of GDM is approximately 7%, ranging from 1%-14%.¹ This suggests

that GDM prevalence in American Samoa is high and should be prioritized as a significant health concern in American Samoa.

This study is the first of its kind to establish a prevalence of GDM in American Samoa, however, there are limitations. Despite our ability to establish a prevalence of GDM, this estimate is potentially biased and underestimated. Only 25% of women (n=250) were screened for GDM as recommended. Those who

were excluded from the study had increased maternal age, gravida, PNC, and decreased gestational age at birth. This is expected because those excluded were women with higher risk pregnancies such as multiple births or pre-existing diabetes. These demographics suggest that those included in the sample may not represent the true population of all pregnant women in American Samoa in 2016 and indicative of selection bias. This sample was based on only 1 year of births. Future research is needed to expand data collection for a more representative and comprehensive prevalence estimate.

There were changes to screening practices compared to a 2009 study of GDM. The current findings show an improvement in the percentage of women screened for GDM in the correct time frame from 12.8% in 2009 to 41.8% in 2016.¹⁵ However, there was a drop in the total percentage of women who received any GDM screening, from 86.5% in 2009 to 60.1% in 2016.¹⁵ Barriers such as: parity, lack of prenatal care education, health literacy, familial and social support, and unemployment limit women's ability to obtain GDM testing.^{9,18} Despite increased funding in 2016 for prenatal care, there was a large portion of women not receiving appropriate GDM screening.

GDM treatment is essential to improve mother and child outcomes. The 2018 American Diabetes Association guidelines recommend lifestyle management, medical nutrition therapy, and pharmacologic therapy.¹⁹ Left untreated, GDM carries an increased risk of perinatal morbidity along with increased risk of pregnancy complications.^{16,20} The current findings revealed few women diagnosed with GDM initiated and received treatment. Barriers to treatment are similar to those for prenatal care: lack of social support, unemployment, and transportation to the hospital and pharmacy.⁹ The highest compliance was for nutrition counseling. Nutritionists based at the hospital reduce the need for additional appointments. Reducing barriers and increasing accessibility to treatment can improve treatment outcomes.

A limitation to this study was poor data quality, including high amounts of missing data. Although all mothers had age at delivery recorded, some women did not have a marital status ($n=39$, 3.8%), gestational age at delivery ($n=16$, 1.6%), and gravida ($n=1$, 0.1%) recorded. A major demographic limitation was the lack of socioeconomic status and limited BMI documentation. Only 14% of the records included height and weight measurements or a calculated BMI. Excessive gestational weight gain and BMI are associated with adverse outcomes such as cesarean delivery, abnormal size for gestational age, and infant obesity.² Considering these outcomes is imperative to accurately document pre-pregnancy height and weight. Village or residency status could be a valuable variable. However, only 66 women had this documented. This limited documentation restricted the scope of this analysis and provides areas for future research.

Despite these limitations, multiple data sources were included to improve completeness. Further, women with pre-existing

type 2 diabetes were identified and excluded from prevalence analysis. The inclusion of treatment outcomes provides valuable feedback to clinicians.

Since the time of data collection in 2016, American Samoa has experienced nutritional and chronic disease transitions. Compared to a 2004 NCD population survey, an updated survey in 2019 showed obesity increased from 80.2% to 82.7% among women. Hypertension increased from 27.5% (+/-5) to 38.4%. Diabetes decreased from 42.4% (+/-4.2) to 32.3%.¹⁰ Notably, a higher diabetes cut off value was used in 2019; 126 g/dl compared to 110 g/dl in 2004. These positive NCD trends increase concern surrounding GDM and maternal health outcomes. A declining economy and collectivist familial structure provide even more barriers for women to adhere to diet, exercise habits, and positive health changes during pregnancy.^{18,21} The prevalence has likely increased since the current measurement in 2016 due to increased health burden, possibly increased GDM testing, and social transitions.

Due to the high estimated prevalence of GDM in American Samoa and lack of appropriate testing, it is recommended that prenatal GDM screening is conducted for all women. Free prenatal care is now provided in CHCs, making them the ideal point of care for testing. It is recommended that EHR training be expanded to increase efficiency and be used for patient care and data management. Increasing the completeness of the EHRs will provide reliable records to increase quality of care and reliable research.

Conclusion

Non-communicable disease is increasingly affecting vulnerable populations in the Pacific Islands, American Samoa among them.^{22,23} This study highlighted the need to focus attention on GDM in American Samoa. Based on the current sample, the estimated prevalence of GDM in American Samoa was 14.0%. Low GDM screening rates and poor treatment coverage increases concern for adverse outcomes. Expanding access to GDM testing and providing clinician EHR education are steps to provide better GDM care. These findings suggest that GDM is highly prevalent in American Samoa necessitating future research surrounding GDM, barriers to prenatal care, GDM treatment, and NCD risk among mothers and children.

Conflict of Interest

None of the authors identify a conflict of interest.

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Appendix Data Collection Elements			
	Labor and Delivery Log Book	Postpartum Data Set	EHR
Party responsible for data collection and management	Labor and Delivery Department LBJ Hospital	Department of Health- Maternal and Children's Health Program	LBJ Hospital and Community Clinics
Maternal Variables			
Mothers Hospital ID No.	x	x	x
Delivery No.	x		
Patient Last Name	x	x	x
Patient First name	x	x	x
Maiden Name	x		x
Mothers DOB		x	x
Mothers Age		x	
Residency Status	x		x
Village		x	x
Gestational Age at Birth	x	x	x
Full Term (Yes, No Status)		x	
Fetal Death/ Fetal Demise	x	x	x
Twin/ Multiple Birth	x	x	x
Grava	x		x
Para	x		x
Membrane Rupture	x		x
Induction	x		x

	Labor and Delivery Log Book	Postpartum Data Set	EHR
Zika Status	x	x	x
Sections	x		x
Delivery Date	x	x	x
Deliver Time	x		x
Episiotomy and Repair	x		x
APGAR/1	x		x
APGAR/2	x		x
Number of Prenatal Care Visits	x		x
Maternal Age at Delivery	x		x
Placenta delivery time	x		x
STD (Chl Status)	x		x
GBS Status	x		x
Mothers Hep B Status	x		x
Mothers Height			x
Mothers Weight			x
Nutrition Consultations			x
Diabetic Program Consultations			x
Prescriptions			x
Prescription Status			x
Lab Results			x
Labor Oxytocic Drugs Received	x		x
Complications/ Notes	x		x
Anesthesia received	x		x
Anesthetist	x		x
Patients Nurse	x		x
Physician	x		x
Marital Status			x
Education Status			
Religion			x
Teen Pregnancy (Y/N)		x	
Initiation of Prenatal Care		x	
Gestational Age at 1st PNC Visit (Weeks)		x	
Number of Observed PNC Visits		x	
Number of Expected PNC Visits		x	
Trimester Number at 1st Visit		x	
Adequacy Services Received		x	
Adequacy PNC Services Received		x	
Adequacy of PNC Utilization (Kotelchuch Index)		x	
Baby Variables			
Baby Hospital ID No.	x	x	x
Baby Sex	x		x
Color at birth	x		x
Baby Weight(kg/lbs)	x	x	x
Baby Length	x	x	x
Rh Factor	x		x

Evaluation of Payment Transformation in Hawai'i Based on Physician Perspective

Kurtis Young BS; Jason Huynh BS; Kathleen Joo BS; Kelley Withy MD, PhD

Abstract

The Hawai'i Medical Service Association's (HMSA) Population-based Payments for Primary Care (3PC) system has been in effect since 2016. There is limited literature regarding physician opinions on this payment transformation policy change. The objective of this study was to evaluate physician responses to a survey regarding the 3PC payment transformation system and identify methods to support physicians in Hawai'i. An online survey was sent to 2478 Hawai'i physicians and yielded 250 responses. A total of 77% respondents reported being unhappy with payment transformation, while 12.9% and 10.1% reported being indifferent and happy, respectively. Of responding physicians, 60.6% reported a decrease in overall income, whereas 24.9% and 14.5% reported no change or an overall increase, respectively. Open-ended responses were categorized into theme clusters: negative impact on primary care, increased administrative burdens, decreased quality of patient care, decreased physician reimbursement, preference to treat healthier patients, harm to private practice, harm to newer practices, ignored physician sentiments, and worsened physician shortage in Hawai'i. Respondents, especially those working in primary care, are dissatisfied with payment transformation. Future research is needed to compare the thematic clusters identified in the current study with relevant literature.

Keywords

Payment transformation, capitated payment, Hawai'i, physician reimbursement

Abbreviations

3PC = Population-based Payments for Primary Care
AA = Aired Alliance
AHEC = Area Health Education Center
FFS = fee-for-service
HMSA = The Hawai'i Medical Service Association
PCP = primary care physician
PMPM = per-member-per-month

Introduction

One of the key measures of patient satisfaction in health care across the United States is that a physician spends enough time with the patient.¹ However, under the fee-for-service (FFS) model of reimbursement, primary care physicians (PCP) are incentivized to administer greater quantities of treatments rather than coordinating preventative care and care between physicians.² This results in a financially driven focus to see more patients, thus establishing the conventional, shortened 15-minute clinic visits in modern medical practice.³ This burden impacts PCPs significantly, placing additional strain on the already short-handed frontline of the health care system. After considering

the problems with the FFS model of reimbursement, it is appealing to prioritize the quality of patient care over the volume of patients seen.⁴ The Hawai'i Medical Service Association (HMSA) attempted to address this issue with a new payment transformation program known as Population-based Payments for Primary Care (3PC) program. HMSA is the predominant insurance provider in Hawai'i for large group carriers (64%), small group carriers (51%), individual direct purchases (53%), and low-income markets (45%) by percent member months, defined as the number of individuals multiplied by the number of months in the policy.⁵

HMSA describes its 3PC program as attempting to align physician financial incentives with a patient-centered monthly model of reimbursement.⁶ The 3PC program is designed to replace the traditional FFS payment with a capitated per-member-per-month (PMPM) payment. The PMPM base payment provides an additional 20% incentive for performing specific patient engagement measures and provides a new shared savings bonus of up to 40% for physician organizations that spend less than their historic spending. The new payment model aims to encourage patient engagement without reducing quality of care. It also attempts to encourage organization-wide incentives to reduce unnecessary utilization and decrease costs.⁶ This payment model was implemented with a trial group of physicians in 2016 with additional participants being added in a staggered fashion.⁷ Navathe et al investigated the differences between pre-3PC years (2012-2015) and post-3PC years (2016) to assess the effectiveness of the new PMPM model of payment.⁷ The outcomes of the study aligned with several of the objectives of the 3PC program, including improving population health and decreasing unnecessary health care spending. The 3PC system did not significantly improve the quality of health care provided by a "composite quality measure" between 2012-2015. Additionally, the authors found no statistical differences in overall costs of health care spending.⁷ Although 3PC was considered as being successful at improving patient care,⁸ the findings from Navathe et al were statistically insignificant or minor, and further investigations are needed to understand the impact of payment transformation.

Payment transformation in Hawai'i is a recent change and there is limited literature available to understand the potential impact of this policy on physicians, patients, and payers. Although the 3PC system has been in effect since 2016, physician opinions regarding this policy change are largely undescribed. The

purpose of this study is to investigate the opinions of PCPs regarding payment transformation in Hawai‘i. This study will provide insight into changing payment methodology, its impact on PCPs, and identify ways to support physicians’ practices.

Methods

An online survey was developed to ask 4 questions regarding practice type, satisfaction with payment transformation, financial impact of payment transformation, and an open-ended question for comments by physicians. Internal Review Board (IRB) approval was obtained from the University of Hawai‘i Committee on Human Subjects, #2019-583. The survey was sent to 2478 Hawai‘i physicians identified through a list compiled from contact information acquired by the Area Health Education Center (AHEC) in May 2019 and 120 responses were received. Most of the initial responses were from PCPs who commented on the impact of payment transformation on their practice. In August 2019, 2 more email reminders were sent out to a subset of 897 PCPs, yielding an additional 130 responses. The survey was closed to participants in March 2020. The survey was anonymous, and participation was voluntary.

Data were analyzed using SurveyMonkey® software (Momentum, San Mateo, CA) for descriptive characteristics (percentage responding), and the qualitative data were analyzed using NVivo software (QSR International Pty Ltd., Melbourne, Australia).⁹ Closed-ended responses on physician satisfaction and changes in income were recorded on a 5-point Likert Scale. Participants were provided with 4 choices regarding their practice setting. These included: (1) employed, (2) private practice, (3) locums, and (4) other. Using NVivo software, the open-ended responses were categorized into 9 primary thematic clusters for describing the qualitative data. The thematic cluster count of each theme is reported, as are terms commonly used in responses. Specifically, 2 authors (K.Y. and J.H.) independently reviewed the coded individual answers. Any disagreements were resolved through discussion or through the involvement of a third author (K.J.).

Results

A total of 250 responses were received to the email inquiry. Of the initial 120 responses, there was an approximate 5% response rate (120/2478). However, the response rate increased to almost 15% when surveys were sent out a second time to the PCP group (130/879).

Practice Setting

Over three-quarters of respondents (77.1%) were in private practice, with the second most frequent choice being employed (19.3%). Only 2 participants reported being locums (0.8%). Of the 7 (2.8%) participants who chose other, 2 quit private practice

to become employed. The other 5 included: quitting private practice to leave Hawai‘i, working in a contract group, working in multiple practice settings, denying insurance altogether, and no longer practicing clinical medicine.

How Physicians Feel about Payment Transformation

Out of 248 completed responses, 55.2% reported being very unhappy, 21.8% being somewhat unhappy, 12.9% being neither happy nor unhappy, 7.7% being somewhat happy, and 2.4% being very happy with payment transformation in Hawai‘i (Table 1). In summary, most respondents (77%) reported a level of unhappiness about payment transformation, 12.9% reported indifference, and 10.1% reported a level of happiness.

How Payment Transformation has Changed Physician Income

Out of 241 completed responses, 49.4% reported an income decrease of 10% or more, 11.2% reported an income decrease of less than 10%, 25.0% reported no change in income, 7.0% reported an increased income under 10%, and 7.5% reported an increase of income more than 10% (Table 2). In summary, most physicians (60.6%) reported a decrease in income, 25% reported no change in income, and 14.5% reported an increased income.

Open-ended Questions

Participants were given the opportunity to express their opinions about payment transformation in an open-question format. They were asked, “Tell us what you think of Payment Transformation in Hawai‘i and if you have recommendations for improvements in Payment Transformation or other ways to support physicians in Hawai‘i.” The study received a total of 209 qualitative responses, which were coded as either positive, negative, or neutral. There were many statements made about payment transformation, with 200 responses (95.7%) reporting negative opinions. Terms often used were: “inadequate,” “administrative burden,” “quality of care,” “financial burden,” “not fair,” “poor communication,” “no patient benefit,” “insurance companies profit,” “physician shortage” and “prior authorization process.” In contrast, 8 responses were identified as neutral and 1 response as positive regarding payment transformation. The positive response reported that payment transformation improved patient care after 1 to 2 years. From these responses, 9 thematic clusters were identified through NVivo thematic analysis. These were, in order of prevalence: negative impact on primary care, increased administrative burdens, decreased quality of patient care, decreased physician reimbursement, preference to treat healthier patients, harm to private practice, harm to newer practices, ignored physician sentiments, and worsened physician shortage in Hawai‘i (Figure 1).

Response ^a	Number	Percent of total
I am very happy with the program	6	2.4%
I am somewhat happy with the program	19	7.7%
I am neither happy nor unhappy with the program	32	12.9%
I am somewhat unhappy with the program	54	21.8%
I am very unhappy with the program	137	55.2%
Total	248	100%

^a Q. How do you feel about Payment Transformation in Hawai'i?

Response ^a	Number	Percent of total
Decreased income more than 10%	119	49.4%
Decreased income less than 10%	27	11.2%
Same income as 2016	60	24.9%
Increased income less than 10%	17	7.0%
Increased income more than 10%	18	7.5%
Total	241	100%

^a Q. Has Payment Transformation changed your income compared to 2016?

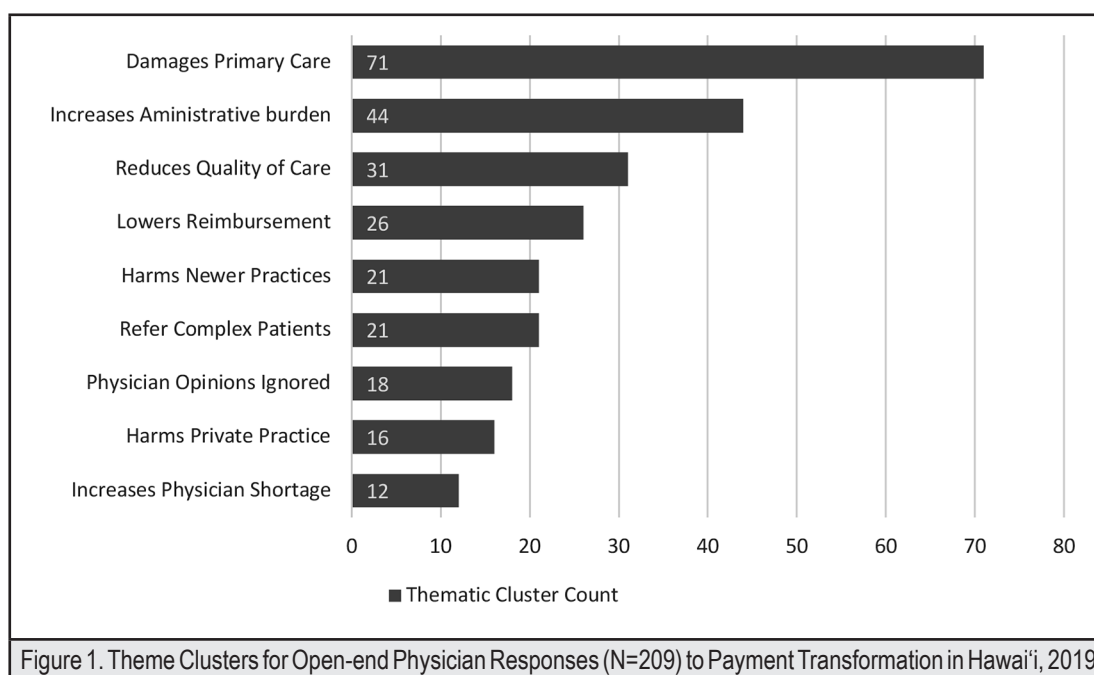


Figure 1. Theme Clusters for Open-end Physician Responses (N=209) to Payment Transformation in Hawai'i, 2019

Discussion

HMSA's implementation of payment transformation was undertaken to improve health care in Hawai'i. After the 3PC payment transformation, the AamedAlliance (AA) organization performed a comprehensive survey of PCPs in Hawai'i. The study concluded that the changes seen with payment transformation were largely detrimental to primary care practices.¹⁰ This survey adds to the AA study's conclusions and further characterizes the impact of payment transformation on PCPs with more physician responses and identification of thematic clusters.¹⁰

Financial Impact

The results suggest that the financial impact of payment transformation may be worse than previously stated.¹⁰ The current study revealed that 60.6% of respondents, the majority of whom

are PCPs, lost income. This suggests a greater percentage of physicians are losing income than previously documented in the AA study. This study further showed that 49.4% of physicians reported an income decrease of 10% or more, indicating that nearly half of PCP practices are losing a large percentage of income. The loss in income may lead to closure of their private practices, and the AA study showed that the majority of PCPs (65%) knew of another primary care practice that closed due to financial strains.

The AA study suggested some potential causes of the loss of practice income. The AA study reported that 80% of PCPs believed that payment transformation increased administrative burden causing longer work hours, more requests for financial support, more hired staff, and fewer patients seen.¹⁰ This study identifies administrative burden as the second most-identified thematic cluster, which is consistent with the AA study, but also

identifies lower reimbursement as the fourth highest thematic cluster (Figure 1). This study shows that lower reimbursement after payment transformation may be associated with decreased income in PCP practices, which was not previously documented in the AA study.

Quality of Care

The 3PC payment model aimed to encourage patient engagement without reducing quality of care. The AA study showed that 55% of respondents somewhat or strongly disagreed that payment transformation allowed them to deliver a higher quality of care.¹⁰ PCPs withheld treatments they believed were needed or they referred complex, sick patients to urgent care clinics. The AA study concluded that quality of care was not improved after payment transformation, but it did not conclude that quality of care was reduced. This is consistent with the findings of Navathe et al, which showed no significant improvement in quality of care between pre-3PC and post-3PC models.⁷ In contrast to prior studies, this study revealed the third most-identified thematic cluster as decreased quality of patient care after payment transformation (Figure 1). Many respondents believe that their quality of care has decreased, which is inconsistent with the goal of 3PC payment transformation.

Happiness

This study aimed to assess physician happiness with payment transformation, which was not addressed in the AA study. Most physicians (77%) reported unhappiness with payment transformation with fewer physicians (10.1%) indicating happiness. The thematic clusters in this study revealed a predominance of negative responses (95.7%) with only 1 positive response about payment transformation. Although level of happiness is an ambiguous term, the thematic clusters identify the most significant impacts of payment transformation on PCP practices, which may indirectly affect their level of happiness. Potential areas of unhappiness may stem from overall negative impact of primary care, increased administrative burden, decreased patient quality of care, decreased reimbursement, preference to treat healthier patients, harm to private practice, harm to newer practices, ignored physician sentiments, and worsened physician shortage in Hawai‘i (Figure 1). Any or all of these themes may contribute to PCP unhappiness. The reasons for the negative impact and unhappiness can be identified by their reporting of elevated administrative burden, decreased the quality of patient care, reduced reimbursement, and ignored physician sentiment. Furthermore, PCPs reported spending significantly more time on administrative burdens to obtain the additional 3PC financial incentives. As a result, the respondents reported not only losing income, but also losing motivation to practice primary care.

Physician Shortage

According to the AA study, 80% of PCPs believe that payment transformation is worsening the physician shortage in Hawai‘i, and 80% of PCPs also would not recommend that someone entering the field of medicine to come to Hawai‘i to practice primary care. The AA study’s conclusions are consistent with this study, which identified the ninth thematic cluster as worsening physician shortage due to payment transformation. In the context of a growing physician shortage in Hawai‘i, the demand for PCPs continues to rise. The 2019 Physician Workforce Assessment reports a shortage of approximately 300 full-time equivalents of PCP services and significant shortages in subspecialties across all islands. The data on physician shortage in Hawai‘i mirrors the physicians’ concerns of worsening PCP shortages and specialist integration.¹² These numbers were reported before the COVID-19 pandemic, which led to many physicians in the nation to close their offices, worsening the physician shortage.¹³

Improvements to Payment Transformation

In the AA study, 93% of PCPs reported that payment transformation needs to be improved, possibly re-integrating a fee-for-service model.¹⁰ The current survey data show that physicians, especially those working in primary care, are dissatisfied with payment transformation due to higher administrative burden, decreased quality of care, lower reimbursements, and ignored physician sentiments. Alternative payment models have yet to be proven effective in reducing health care spending or improving the quality of patient care.¹¹ While alternative payment models may not be effective in reducing health care spending and increasing patient satisfaction, supplementing the program with additional services and peer comparisons interventions may prove beneficial. In a prospective analysis, Ross and colleagues found that using an alternative payment methodology to support behavioral health services in primary care generated a \$1.08 million net cost savings, primarily associated with a reduction in utilization of downstream services such as hospitalizations.¹⁴ A recent study looking at the effectiveness of peer comparisons in improving the quality of care provided by primary care physicians found that a peer comparisons intervention increased quality scores among Hawai‘i physicians by 3%.¹⁵ This intervention consisted of a comparison of physician performance relative to that of their peers, and this feedback was provided via email over the course of 37 weeks. Future policy reform with an emphasis on behavioral health as well as professional norms among peers may increase physician satisfaction while reducing health care costs and improving quality of care.

One possible next step to improving primary care in Hawai‘i would be to create a wider group of physicians to work with

insurers and patients, thus increasing physician input and balancing the sense of voice and power to examine fair payment methodology in Hawai'i. The qualitative responses provide evidence for physician input in payment processes. A pilot program could be implemented based on the findings of such a group. Physician and patient satisfaction, changes in health care spending, and specific quality metrics could be measured. This way, physicians may not feel like their opinions or sentiments were being ignored, and a relationship built on communication and trust could be solidified.

The 3PC program marks an important first step in creating a more effective, improved health care system for PCPs, patients, and insurers in Hawai'i. Despite the shortcomings and flaws with the program, the central objective of aligning patient care with value, rather than volume, remains essential to a brighter future for both patients and physicians in Hawai'i.

Limitations

There were several limitations in this study. This survey was conducted in a single health care market with a 10% response rate and a small sample, and therefore, results may not be generalizable to other health care markets. All participants were identified through a list compiled from an AHEC registry, and these physicians may not be representative of the entire physician population in Hawai'i. In addition, there may be self-selection bias as it is more likely that physicians with the strongest negative opinions regarding payment transformation responded compared to physicians with no opinions. This could, in part, account for the majority of negative responses regarding payment transformation. Nevertheless, a strength of this study is the reporting of physician opinions on payment transformation that negatively affect their practice. The findings provided here may provide health care systems such as HMSA with insight from physicians who are underrepresented in payment transformation decisions. The initial survey invitation was sent to a sample of physicians consisting of both specialists and PCPs but the data is primarily represented by primary care. Responses cannot be further delineated between specialists and PCPs. The study was limited to 4 questions that may not provide enough detail on physician opinions on the 3PC model. Currently, there is no data available regarding rural practices, specialty, group size, and whether the physician was in the 3PC pilot program or numbers of years in practice. The data from the open-ended response were qualitative and statistical testing was not conducted for the responses.

Conclusion

Future research evaluating methods to address the thematic clusters identified in the current study is needed. For instance, an assessment of a streamlined payment process that decreases administrative burden and sustains or improves the quality of patient care or a review on methods for PCPs to provide

high quality care to complex patients who do not meet quality measures would be helpful. There is a need for improved communication between the physicians and the insurer when establishing health care policies. This is of particular importance for physicians who are not legally allowed to negotiate for changes in reimbursement strategies, even through physician organizations. Future investigations should identify avenues in which physicians' voices can be better heard and hold a higher priority in policy planning.

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MEDICAL SCHOOL HOTLINE

The Hawai'i Community CSE Project: A Comprehensive Sexuality Education Program through JABSOM's Medical Lens

Pia Francisco-Natanauan MD; Arlene Parubrub Kiyohara MS

In 1993, the Medical School Hotline was founded by Satoru Izutsu PhD (former vice-dean UH JABSOM), it is a monthly column from the University of Hawai'i John A. Burns School of Medicine and is edited by Kathleen Kihmm Connolly PhD; HJH&SW Contributing Editor.

In the US, sex education in the classroom is often the only resource for children and adolescents to explore concepts about body changes in puberty, healthy relationships, sexual orientation, and gender identity. It is mandated in 39 states and the District of Columbia, and the content is highly variable.¹ In the state of Hawai'i, sex and HIV education are mandated, and the content is medically and age-appropriate. Schools do not need parental notice or consent, however, parents may opt their children out of this curriculum. Sex and HIV education content in Hawai'i public schools must include information about contraception, condoms with a focus on abstinence, healthy relationships, sexual decision-making, self-discipline, dating, and sexual violence prevention.²

Sex education programs were originally designed to decrease teen pregnancy rates and sexually transmitted diseases (STD) with the primary foci being abstinence, contraception, and condom use.³ Evidence has shown that programs have been successful in decreasing teen pregnancy rates, although the US continues to have the highest teen pregnancy rate among developed countries.⁴ Data from the Centers for Disease Control and Prevention (CDC) dating back to 1993 consistently show that adolescents 15-19 years old constitute half of the nation's STD cases.⁵ The decline in the teen pregnancy rate is attributed to contraceptive use by adolescents and the increase in contraception education, particularly among males. An ongoing debate in certain parts of the country has had varying inputs on who is responsible and capable to talk to and educate children about sex. For example, on March 8, 2022, the Parental Rights in Education Bill was passed in the state of Florida, which prohibits schools from discussing Sexual Orientation and Gender Identity (SOGI) in primary grade levels.⁶ The differences in policies across the nation leave many children and adolescents without valuable and medically-sound sex education.

The Chicago Experiment 1913

The Chicago Experiment marked the beginning of sexual education programs within US schools.⁷ In 1913, as superintendent of

the Chicago Public Schools, Dr. Ella Flagg Young advocated to the Chicago Board of Education to provide K-12 public school students sexual hygiene education based on scientific evidence. The curriculum was divided into 3 areas: (1) personal sexual hygiene, (2) problems of sex instincts, and (3) hygienic and social facts about venereal disease. However, the actual content of the sexual health education varied based on the values and beliefs of the stakeholders within the Chicago Public Schools. Dr. Young's appeal to the city's institutional representatives and to the board of education had conflicting issues on sexuality education. Social purists based it on morality or ideology in which abstinence is the dominant or only contraceptive form. Social hygiene professionals based it on science or empiricism in which safe sex is promoted to reduce sexually-transmitted diseases and unplanned pregnancies. There is ongoing debate on whether sexual education should be taught in schools and what type of information the sexual education curriculum should include. The Chicago Experiment was discontinued after the first year because of the challenges in the distribution of the health education lectures to parents under the Comstock Act, which prohibited the circulation of contraception materials via mail. Interestingly, the debate about sexual education continues to exist in 2022, over a century later.

Comprehensive Sexuality Education, the CDC, and the School Curriculum

The current guideline from the American Academy of Pediatrics (AAP) recommends the comprehensive sexuality education (CSE) approach to sexuality education. CSE delivers age-appropriate, non-judgmental information about puberty, relationships, and sexual health. It covers human sexuality, including intimate relationships, human sexual anatomy, sexual reproduction, sexually transmitted infections, sexual activity, sexual orientation, gender identity, abstinence, contraception, and reproductive rights and responsibilities for children and adolescents with and without chronic health conditions and disabilities in the United States.⁸ The CDC Healthy Schools instituted the National Health Education Standards (NHES) of

the Division of Population Health, as a framework for health educators, teachers, and administrators.⁹ NHES, in conjunction with the Characteristics of Effective Health Education and the Health Education Curriculum Analysis Tool (HECAT) from the CDC Division of Adolescent and School Health, have been established to promote the health and well-being of students from preK-12.¹⁰ The HECAT module on sexual health has set standards appropriate for each respective grade level with Healthy Behavior Outcomes (Table 1).

Mind the Gap: The Medical Education and the Medical Community

Across the US, health disparities for transgender and gender-diverse children, adolescents, and young adults (CAYA) are increasing, while clinicians continue to lack the training to support the growing need.¹¹ SOGI and transgender health have been hot topics for continuing medical education (CME) in adult and pediatric primary care. Medical education is an avenue to teach competency to students and practicing clinicians alike. At the University of Hawai'i (UH) John A. Burns School of Medicine (JABSOM), during the Life Cycle module (MD-7) second year medical students (MS2) learn about a human's life stages. MS2s attend lectures on adolescent psychosocial growth and development and the conditions common during adolescence. Skills practice in the community includes interviewing middle school students and youths in a juvenile facility. Currently, due to the coronavirus disease (COVID-19) pandemic, the skills practice is temporarily discontinued due to social distancing mandates.

To address the need for clinical training in sex education, in September 2020, Dr. Lydia Rolita, a former UH Family Medicine Residency Program Director, and Dr. Andrea Gregerson, then a Family Medicine Post-Graduate Year 3 resident, presented a research poster at the Hawai'i Health Work Summit on developing a student-based curriculum to teach puberty to 5th

graders.¹² They found that 5th graders are interested in sexuality and body changes discussed in a non-judgmental way. Although puberty education is required by the Hawai'i State Department of Education (HIDOE), delivery by teachers varies since there is no guidance on its methods. Puberty education is typically part of health class, presented in a generalized objective format without addressing matters around SOGI. In conclusion, they recommended a longitudinal sex education school curriculum and having students talk with their health care providers to improve adolescent sexuality education.

A Hawai'i Community Project on CSE

As a result of the need for CSE, in fall of 2021, the Community CSE Project to promote CSE in elementary and high schools was conceptualized and developed by JABSOM faculty member Dr. Pia Francisco-Natanauan and Dr. Lydia Rolita. The Community CSE Project aims to increase student, parent, and teacher awareness on CSE using evidence-based and medically accurate information delivered in a school curriculum. Interested public and private schools participate in round table discussions with their students and teachers facilitated by project leaders. The audience is given a survey before and after the presentation for needs assessment and for project feedback. CSE topics requested by the schools included SOGI, healthy relationships (including internet safety), and puberty/body image. With the project's growth, interest from the UH JABSOM MS2s increased and MS2s can volunteer as facilitators after MD-7. Additionally, fourth year medical students enrolled in the Adolescent Medicine elective, Family Medicine residents on Community Pediatrics rotation, and Pediatric residents on Adolescent Medicine rotation also take part as facilitators. The elementary and high schools choose the health topic in CSE to be discussed. A lesson plan on the chosen topic is developed and shared with the facilitators followed by a workshop. The workshop requires facilitators to research and learn the health topic and to carry out a mock discussion and role play

Table 1. Healthy Behavior Outcomes from the Health Education Curriculum Analysis Tool module. ¹⁰	
Healthy Behavior Outcomes (HBO)	
1	Recognize developmental changes experienced by self and others during childhood and adolescence.
2	Establish and maintain healthy relationships.
3	Treat all people with dignity and respect with regard to their gender identity and sexual orientation.
4	Give and receive consent in all situations.
5	Be sexually abstinent.
6	Engage in behaviors that prevent or reduce sexually transmitted infections (STIs), including HIV.
7	Engage in behaviors that prevent or reduce unintended pregnancy
8	Support others to avoid or reduce sexual risk behaviors
9	Avoid pressuring others to engage in sexual behaviors
10	Use appropriate health services to promote sexual and reproductive health.

Health Education Curriculum Analysis Tool (HECAT). In: *Centers for Disease Control and Prevention website. Adolescent and School Health. Program Tools. Sexual Health Module*. https://www.cdc.gov/healthyyouth/hecat/pdf/2021/hecat_module_sh.pdf

that includes feedback from the program faculty mentor, Dr. Francisco-Natanauan. Thus, the project strives to enrich medical trainees' experiences in delivering preventive and anticipatory guidance for CAYA health care by practicing sound and non-judgmental conversations at the community level. The project aspires to bridge the knowledge gap of the medical students and resident physicians by incorporating skills experience during an elective or residency.

It would be ideal for Hawaii's children to receive CSE in the safety of the classroom and with trusted adults and teachers. Medical providers need to bridge the knowledge gap on CSE in our clinics and beyond. Puberty is a sensitive and awkward topic between parents and children. The timing of puberty discussions can vary depending on family beliefs, practices, and dynamics. If puberty starts early, which can happen as early as 3rd grade in girls, the discussion needs to take place sooner than middle school. Primary care providers have the unique opportunity to counsel patients and their families about the normalcy of teaching sexuality to children during the annual well child visits. Talking about body parts, sex, sexual orientation, gender identity, puberty, body image, dating, and healthy relationships should happen safely with the people CAYA trust. Medical providers can discuss these topics extensively and confidentially with mid-adolescent (14 years) and older patients, as it is their right to privacy during any medical encounter. AYA have the right to choose and make decisions for themselves without parental consent on family planning services, hopefully, with sound guidance and support from their health care providers.

Conclusion

There is a need to bridge the knowledge gap in CSE in the Hawai'i schools, communities, and health care settings. While sexuality education is required by the HDOE, delivery varies due to the lack of standardized methodology and the generalized approach. There are no guidelines for discussing specific important matters such as SOGI. The Hawai'i Community CSE Project will provide a helpful method in the classroom and in the community using evidence-based practices from a medical perspective. The project also upgrades the clinical learning experience of medical trainees as early as MS2 and enriches clinical training of primary care residents. The future direction of this project will include making webinars and CME conferences based on the project experience that will be helpful to the entire medical community, especially for practicing clinicians counseling patients on CSE. As it is heard often that it takes a village to raise a child; in Hawai'i, it takes one big 'ohana (family) to advocate for CSE.

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Next Gen Hawai'i: Collaborative COVID-19 Social Media Initiative to Engage Native Hawaiian, Other Pacific Islander, and Filipino Youth

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Abstract

The Next Gen Hawai'i social media project was initiated in the fall of 2020 to address ongoing public health concerns and the need for accessible and reliable information across Hawai'i's diverse communities by strategically amplifying the voices of Hawai'i's youth in their Native languages. The collaborative effort arose from conversations within the Hawai'i's Native Hawaiian & Pacific Islander COVID-19 Response, Recovery, and Resilience Team, composed of diverse public and private organizations involved in statewide COVID-19 response efforts for Native Hawaiian and Pacific Islander communities. Next Gen Hawai'i's focus was on Native Hawaiian, Pacific Islander, Filipino, and other populations disproportionately suffering from COVID-19. Five social media platforms were developed to spread messaging to youth and young adults about COVID-19. Public Health Ambassadors (from high school to young adults) were recruited and engaged to create culturally and linguistically rooted messaging to promote public health and prevention-based social norms. This strength-based approach recognized youth as important community leaders and ambassadors for change and empowered them to create content for dissemination on platforms with national and global reach. Messaging was designed to build individual, community, and digital health literacy while integrating core cultural values and strengths of Native Hawaiian, Pacific Islander, and Filipino communities. Over 250 messages have been delivered across Next Gen Hawai'i social media channels on topics including vaccine information, mask-wearing, staying together over distances, mental health, and in-languages resources in Chuukese, Chamorro, Marshallese, Samoan, Hawaiian, Ilocano, Tagalog, and other Pacific-basin languages. Reach has included more than 75 000 views from various social media channels, media features, successful webinars, and relevant conference presentations. This *Public Health Insights* article provides an overview of Next Gen Hawai'i's activities and achievements as well as lessons learned for other youth-focused public health social media campaigns and organizations.

Keywords

Health Communication; Social Media; COVID; Native Hawaiian; Pacific Islander

Abbreviations

3R = Response, Recovery, and Resilience Team
COVID-19 = Coronavirus disease of 2019
HDOH = Hawai'i Department of Health
NHPI = Native Hawaiian & Pacific Islander
Next Gen Hawai'i = Next Gen Hawai'i social media project

OPHS = Office of Public Health Studies

POL = Papa Ola Lōkahi

UHM = University of Hawai'i Mānoa

WHO = World Health Organization

Introduction

The Next Gen Hawai'i social media project¹ (Next Gen Hawai'i) was initiated in the fall of 2020 to address ongoing public health concerns and the need for reliable and current information across Hawai'i's diverse communities during the Coronavirus disease of 2019 (COVID-19) pandemic. The collaborative effort began in Hawai'i's Native Hawaiian & Pacific Islander (NHPI) COVID-19 Response, Recovery, and Resilience Team (3R), composed of participants from over 60 diverse public and private organizations involved in statewide COVID-19 response efforts.²⁻⁴ The NHPI and Filipino communities were disproportionately impacted by COVID-19 and experienced collateral health issues and social impacts,⁵ yet NHPI 3R members noted that many in their communities did not have access to informational resources on how to mitigate health risks or access assistance for food and other basic needs.⁶ While there were many strong grassroots efforts,^{6,7} additional in-language messaging was needed to fully reach all NHPI and Filipino communities.^{6,8} The NHPI 3R team, who convened weekly to discuss what was going on in the communities they served, determined that offering educational content that youth living in multi-generational homes could use to engage and inform family members, creating avenues of access to health resources in the time of COVID-19.

Next Gen Hawai'i was founded to address these gaps from a strength-based approach, recognizing youth as important social media ambassadors and creative forces within their communities for public health and societal change.⁹ Five social media platforms were built for Next Gen Hawai'i to share public health knowledge and resources with those who spoke NHPI and Filipino languages, hoping to leverage social media as a public health tool¹⁰⁻¹² with a goal of reaching, engaging, and empower-

ing youth to stay informed.¹³⁻¹⁹ As NHPI and Filipino communities often include collectivist perspectives, inter-generational households, and strong family and communal relationships,²⁰ reaching NHPI and Filipino youth was considered a meaningful pathway for sharing critical public health information into families, social networks, and communities and, thus, building individual, community, and digital health literacy.^{21,22}

This article provides an overview of Next Gen Hawai‘i’s activities and achievements as well as lessons learned for other youth-focused public health social media campaigns.

Background

Five youth-focused Next Gen Hawai‘i social media platforms were developed in 2020²³ and supported by the Hawai‘i Department of Health (HDOH), Papa Ola Lōkahi (POL), NHPI 3R, and the Office of Public Health Studies (OPHS) in the Thompson School of Social Work & Public Health. The focus was on social media given its wide use among youth and young adults. In a recent study of college students, over 95% regularly used some form of social media,²⁴ which is a primary source of health information for many young people.²⁴⁻²⁸ Social media was a particularly vital communication channel during the pandemic when in-person contact was limited. Appropriate, targeted, and relevant social media messaging remains critical to combat the COVID-19 “infodemic” of too much information about

the pandemic, much of which is misleading.²⁹⁻³¹ Social media provides opportunities to communicate health information to the public on a more personal level and to build engagement and trust.¹² Next Gen Hawai‘i built platforms specifically on Tik Tok, Instagram, Facebook, YouTube, and Twitter.

The initial, overarching goal for Next Gen Hawai‘i was to share information about resources and key public health messages recommended by the HDOH to minimize the spread of COVID-19 and support overall health and wellbeing in Hawai‘i’s communities. Messaging included urgent updates related to COVID-19 developments (eg, changes to mandates and gathering protocols) and local resources (eg, food access information,³² pop-up testing sites, rental relief, and vaccine clinics³³) as well as general public health messages (eg, the importance of mental health care³⁴ and addressing COVID-19 misinformation³⁵). As the pandemic evolved, Next Gen Hawai‘i continued to stay relevant to address new and ongoing public health concerns and announcements, such as changing vaccine eligibility guidelines,³⁶⁻³⁸ boosters updates, and travel guidelines. The project is still ongoing with 4 active channels (**Figure 1**). To date, over 250 messages have been posted including in-language resources in Chuukese, Chamorro, Marshallese, Samoan, Hawaiian, Ilocano, Tagalog, and other Pacific-basin languages. Reach has included more than 75 000 views from various social media platforms, as well as media attention, and several successful webinars and presentations.

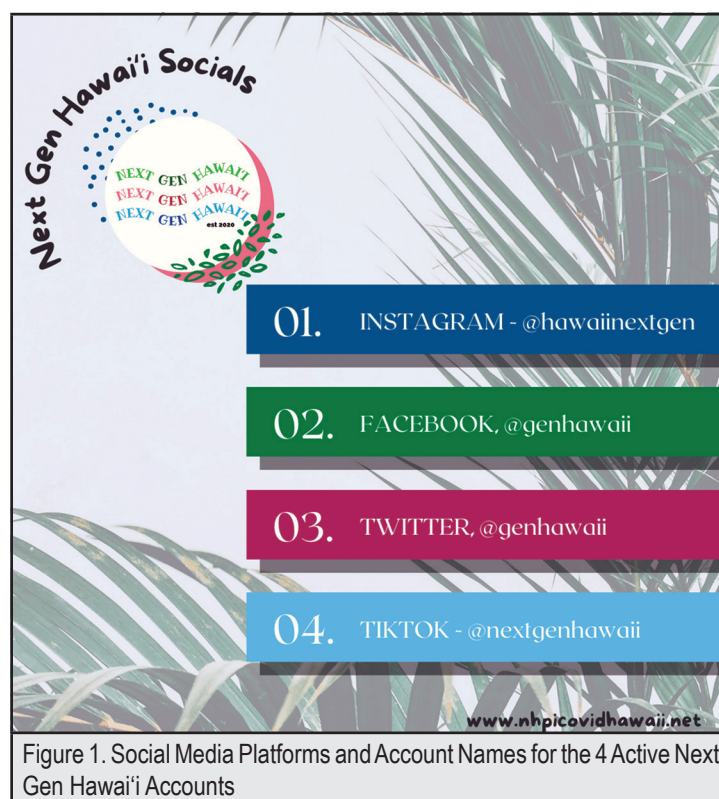


Figure 1. Social Media Platforms and Account Names for the 4 Active Next Gen Hawai‘i Accounts

Next Gen Hawai'i Public Health Ambassadors

Youth are accustomed to using social media channels to stay connected and often interact with messaging incorporated into entertainment and parasocial virtual interaction.^{39,40} Because of this, Next Gen Hawai'i's Public Health Ambassadors (from high school students to young adults) were engaged to serve as positive and trusted social media influencers to deliver personalized messages. Youth with diverse language skillsets were recruited throughout Hawai'i, especially in NHPI and Filipino communities. Ambassadors were linguistically competent in a variety of languages, including Chuukese, Chamorro, Marshallese, Samoan, Hawaiian, Ilocano, and Tagalog. Ambassadors introduced themselves on the social media channels, and shared their reasons for joining the Next Gen Hawai'i project. Ambassadors shared that access to reliable resources was an issue in their communities before COVID-19, but that the pandemic exacerbated those needs and gaps. Content posted on the social media channels included personal stories of adjusting to and living in the pandemic,^{41,42} including getting vaccinated,⁴³ how they stay healthy,⁴³ and their favorite pandemic activities or hobbies.

Relevant public health topics and timelines were developed in communication with the NHPI 3R team and HDOH that reflected

feedback from partners, ambassadors, and the community. Ambassadors were given general topics and message templates and encouraged to respond to them creatively (**Table 1**). This allowed ambassadors to have creative liberty and responsibility for the content within the context of the topics.

A primary focus was short Tik Tok-style videos.^{10,11} Tik Tok, an app designed for sharing brief videos, was in high use during the pandemic, particularly among youth.⁴⁴⁻⁴⁶ Videos were shared on the Next Gen Hawai'i's Tik Tok channel as well as other social media channels. On Instagram, the short videos are called "reels" and are included in the area for personal stories, which run for 1 day, or can be pinned^{47,48} on the Facebook page so they stay highlighted. Some Next Gen Hawai'i videos have been viewed almost a thousand times, leveraging the power of trusted youth-oriented social media ambassadors in this space to build public health-oriented social norms.

Next Gen Hawai'i also created infographics that were translated into different languages to reach communities that did not speak English (**Figure 2**). These were a primary focus on the Instagram account, which has also served as an archive due to its visual capabilities and relevance to youth.

Following wise practices of social media engagement, graphics and video messages were shared with regular postings of

Topic	Example	Language
Videos		
Where to get resources in a hard time	https://www.instagram.com/p/CGoKLfID7v8/	Marshallese
Don't forget about your flu shot!	https://www.instagram.com/p/CHHPNMejdOI/	Chamorro
How to be together when apart	https://www.instagram.com/reel/CHy1-oUDcKx/?utm_source=ig_web_copy_link	Chamorro
You can help kupuna with telemedicine	https://www.instagram.com/p/CH02OqTDUBf/	Hawaiian
Classics Still Apply: Wear your mask; Wash your hands; Observe social distancing; Shaka not shake	https://www.instagram.com/p/CJpYulRDjwW/	Marshallese
What's in your bag? Challenge	https://www.instagram.com/p/CND5MgyLfr9/	English
How to exercise in this time	https://www.instagram.com/p/CK19hVnjawO/	Chamorro
Mental health matters	https://www.instagram.com/p/CNnxNZkrJLB/?utm_source=ig_web_copy_link	Hawaiian
Resources for mental health	https://www.instagram.com/p/CNk65z2LcWL/	English
Getting your COVID shot: Second doses, what to expect, and how to cope	https://www.instagram.com/p/CO32xzADx4r/	Ilocano
Celebrate the little moments	https://www.instagram.com/p/CQHus9FDVqa/	English
When Hawai'i reopens, I want to...	https://www.instagram.com/p/CQ1fR4VnEoR/	Tagalog
What's in my bag? COVID-19 Edition	https://www.instagram.com/p/CND0g-UL1i7/?utm_source=ig_web_copy_link	Hawaiian
Posts		
Two truths and a lie about vaccines	https://www.instagram.com/p/CQb_72SD6ti/	Ilocano
I got vaccinated because...	https://www.instagram.com/p/CQj6Yydg1Vy/	English
It's time to get boosted	https://www.instagram.com/p/CYscXLTr2WA/	Multiple Languages
Make a vaccine acronym	https://www.instagram.com/p/CRkgaszol3t/	English
How to say face mask in your language	https://www.instagram.com/p/CNDf6luATp-/	Multiple Languages



Figure 2. Screenshots from a Next Gen Hawai'i Multilingual Public Health Message (selected)

Mahalo to the Community Alliance on Prisons for sharing the linguistic resources to build the infographics.

new content, usually at least 3 times per week, but often more frequently. These typically included #hashtags (terms which can be searched in social media archives), emojis (tiny pictures), and enthusiastic captions to support engagement. For example, a video done by Elarie, an Ilokano speaking ambassador, was shared with the caption: “Listen in to hear what Elarie hopes to do once Hawai‘i is open again! ✨ #HIGotVaccinated #VaccinateHawaii #COVID19Vaccine.”⁴⁹ In the video, Elarie shared how she hoped to go on her foreign exchange trip to Korea (made possible by the vaccine) and hang out with family and friends when Hawai‘i opened up again. This was as COVID-19 restrictions were starting to loosen after the vaccine was made

available to the general public, keeping content relevant to current events. Additionally, messages were planned so content could be delivered on a specific schedule with the ability to pivot when there was a shift (eg, vaccine availability, booster eligibility, new COVID strains, or newly identified symptoms). Hootsuite,⁵⁰ a leading social media managing dashboard, was used to help organize and maintain posting schedules. Content was planned week-by-week and posted to all social media simultaneously via Hootsuite.

Posts were created to adhere to public health needs. As the ambassadors’ social media feeds established themselves over



Figure 3. Screenshots from the Next Gen Hawai'i Instagram Showing Graphic Design Building from a Sequence

time, a curated archive that shared relevant information and was aesthetically pleasing was created. **Figure 3** shows an example of this sequencing from Instagram.

Messages were posted across all platforms, where they could then be amplified and shared by other individuals or organizations. The social media channels also amplified other programs focusing on public health outreach and messaging to NHPI and Filipino communities and their activities and events.⁴⁸ Youth

engagement did not generally focus on the Facebook page as younger populations often use TikTok and Instagram more frequently. Instead, the Facebook page was used to amplify the shareable content to reach a broader audience that was then re-posted by trusted partners, including OPHS, POL, and the NHPI 3R, who have their own social media with many followers. Twitter was similarly used as an amplification platform, engaging a network including other NHPI, youth, and public health-focused organizations locally, nationally, and interna-

tionally. YouTube was used primarily for video archiving since there was limited engagement with this channel in fall 2020 and was subsequently not kept current over time.

Activities were created to encourage wise practices and engagement with followers such as the Shaka for Shot contest,⁵¹ which promoted vaccine uptake in youth. The ambassadors also engaged with other groups that aligned with the mission and goals of Next Gen Hawai'i. Students in a UHM undergraduate health communication class in fall 2020 and fall 2021 built health communication messages from their lessons in videos shared across the social media platforms as part of a class assignment.^{52,53}

Achievements

The social media channels have had a broad reach and have enabled the project to virtually and physically collaborate with other organizations to share out information and events. The National COVID-19 Resiliency Network and the Asian and Pacific Islander American Health Forum⁵⁴ in a conversation with the National Hispanic Medical Association have shared the project's media information, which led to additional sharing by other organizations and social media users. Ambassadors and their social media connections have also organically amplified Next Gen Hawai'i messages on additional pages, including personal social media accounts. Additional outreach included presentations at local, national, and international conferences. Some examples include University of Hawai'i recognition,²³ a Star Advertiser article,²⁵ a mention in Civil Beat,⁵⁵ and inclusion of some videos in the Pasefika Su'i Fefiloi concert (71 000+ views).⁵⁶ Next Gen Hawai'i presented at the Hawai'i Public Health Institute's Public Health Action Webinar, the International Health Literacy Association, the National Tribal Public Health Summit, the American Public Health Association, and other local, national, and international events. These show ongoing engagement, relevance, and reach, which helps to build trust and continuity within communities. Next Gen Hawai'i was described as an example of this social media outreach to multi-linguistic youth communities specifically in a recent academic public health article.⁵⁷

Lessons Learned

Lessons from this project can inform other social media campaigns and community-facing organizations wishing to promote public health messages to communities. Creating content and scheduling them across platforms takes time and expertise. Each social media platform has strengths and weaknesses for engagement as well as specific criteria and algorithms for posting and amplifying information. Adapting posts created for one channel for another channel may necessitate different formatting, sizing, captions, or uploading strategies. Visuals are important but time-consuming. These are the basic principles of social media marketing, but those without such training may

not build in sufficient time, staff, or resources for these logistics. Participants also learned that while they have made meaningful content, it is hard to make a message go viral.

A strength of social media platforms is that they allow for global engagement; however, a broad reach with open comments enables users who may have not only differing opinions about the public health and health protocols but also various goals to interact publicly. These can include negative comments, problematic links, or inappropriate content. This was the case when Next Gen Hawai'i paid a small fee to "boost" some social media content on Facebook and Instagram to reach more accounts. This strategy reached a wider audience, broadening the reach and providing valuable information in a cost-effective way, but resulted in more anti-vaccine and health misinformation added in the comments of the boosted posts. Negative or misleading comments were typically deleted to minimize their impact on viewership and the spread of misinformation. These instances revealed, in a very intimate way, the incredible impact of misinformation, including deliberately misguided campaigns, and the need to continue to draw upon new knowledge, theory, and wise practices to combat this.

Ambassadors learned personal lessons from participating in the project, including the strengths of having both a collective perspective and personal stories that add value regarding COVID-19 awareness and mitigation. Public health issues affect the whole community and, thus, when one individual is at risk, the community is also at risk. This is particularly true in the pandemic. Everyone in the community needs access to resources, including trusted health information, and to be able to understand how to use those resources. Next Gen Hawai'i was designed specially to create in-language content targeted toward youth who live in multi-generational households so they can share information within their close circle and increase community health and well being through education. Creating social media content on behalf of these NHPI and Filipino communities who are often overlooked in public health messaging was a deeply meaningful experience and there is still so much work to be done. Ambassadors were able to use the experience from this project to build research questions and project ideas for their personal efforts and academic studies.

Another key lesson was learning about timing and perspective. Many community members are on their own timelines of understanding and acting upon public health information and resources because of a history of mistrust and resentment towards the government and other decision-making entities. Public health communication efforts can provide people with the tools and support to make wise decisions, but action may not be immediate. Patience with community members is important as is framing and providing information in ways where it will be best received. Additionally, it is critical to draw upon the rich archive of history and experiences to contextualize the work and decisions made within those communities.

Finally, ambassadors were also able to connect with each other across shared goals at a time when in-person connections were limited due to COVID-19 restrictions. This new method of collaboration presented challenges, but ambassadors fruitfully engaged with each other in the virtual world even with all their busy schedules. Among several collaborations was a “COVID-19 Explained!”⁷⁴³ shared video activity.

Conclusions

The pandemic changed lives dramatically and made in-person events of all kinds impossible to hold, leading to the increased use of online platforms and social channels to stay connected. Social media was a way to not only see loved ones from a distance but a place for many organizations to pivot in order to reach their core audiences virtually. Many health organizations struggled to take advantage of social media.¹² Such efforts demand considerable time and expertise, including staying up-to-date with rapid social media changes, relevant trends, and different platform optimization specifications. Disseminating information across multiple languages is also critical to reaching many vulnerable communities, which necessitates strong translation skills and cultural knowledge by the content creators. Reaching youth and young adults with health messages that feel relevant to them is also critically important yet challenging. Collaborative efforts such as Next Gen Hawai‘i that leverage the knowledge, skills, and creativity of youth for successful multi-linguistic public health messaging from a strengths-based perspective are vital to building trust, strong social norms, and health equity across Hawai‘i communities.

For more information about Next Gen Hawai‘i, contact hawaii-nextgen@gmail.com. Social media: Next Gen Hawaii Instagram @hawaii-nextgen, Next Gens Hawai‘i Facebook @nextgenhawaii, Next Gen Hawai‘i YouTube, Tik Tok: @nextgenhawaii, Twitter: @GenHawaii.

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Hawai'i Journal of Health & Social Welfare (HJH&SW)

Guidelines for Publication of HJH&SW Supplements

The Hawai'i Journal of Health & Social Welfare (HJH&SW) partners with organizations, university divisions, and other research units to produce topic-specific issues of the journal known as supplements. Supplements must have educational value, be useful to HJH&SW readers, and contain data not previously published elsewhere. Each supplement must have a sponsor(s) who will work with the HJH&SW staff to coordinate all steps of the process. Please contact the editors at hjhswh@hawaii.edu for more information if you would like to pursue creating a supplement.

The following are general guidelines for publication of supplements:

1. Organizations, university divisions, and other research units considering publication of a sponsored supplement should consult with the HJH&SW editorial staff to make certain the educational objectives and value of the supplement are optimized during the planning process.

2. Supplements should treat broad topics in an impartial and unbiased manner. They must have educational value, be useful to HJH&SW readership, and contain data not previously published elsewhere.

3. Supplements must have a sponsor who will act as the guest editor of the supplement. The sponsor will be responsible for every step of the publication process including development of the theme/concept, peer review, editing, preliminary copy editing (ie, proof reading and first round of copy editing), and marketing of the publication. HJH&SW staff will only be involved in layout, final copy editing and reviewing final proofs. It is important that the sponsor is aware of all steps to publication. The sponsor will:

- a. Be the point of contact with HJH&SW for all issues pertaining to the supplement.
- b. Solicit and curate articles for the supplement.
- c. Establish and oversee a peer review process that ensures the accuracy and validity of the articles.
- d. Ensure that all articles adhere to the guidelines set forth in journal's [Instructions to Authors page](#), especially the instructions for manuscript preparation and the statistical guidelines.
- e. Obtain a signed [Copyright Transfer Agreement](#) for each article from all authors.

- f. Comply with all federal, state, and local laws, rules, and regulations that may be applicable in connection with the publication, including ensuring that no protected health information appears in any article.
- g. Work with the editorial staff to create and adhere to a timeline for the publication of the supplement.
- h. Communicate any issues or desired changes to the HJH&SW staff in a timely manner.

4. Upon commissioning a supplement, the sponsor will be asked to establish a timeline for the issue which the sponsor and the HJH&SW editor(s) will sign. The following activities will be agreed upon with journal publication to take place no later than 24 months after signing. Extensions past the 24 months will be subject to additional fees based on journal publication rates at that time:

- Final date to submit a list of all articles, with working titles and authors
- Final date for submitting Word documents for copy editing
- Final date for submitting Word documents for layout
- Final date to request changes to page proofs (Please note that changes to page proofs will be made only to fix any errors that were introduced during layout. Other editing changes will incur an additional fee of \$50 per page.)

5. The cost of publication of a HJH&SW supplement is \$5,000 for an 8-article edition with an introduction from the sponsor or guest editor. Additional articles can be purchased for \$500 each with a maximum of 12 articles per supplement. This cost covers one round of copy editing (up to 8 hours), layout, online publication with an accompanying press release, provision of electronic files, and indexing in PubMed Central, SCOPUS, and Embase. The layout editor will email an invoice for 50% of the supplement to the designated editor for payment upon signature of the contract. The remaining will be due at the time of publication. Checks may be made out to UCERA.

6. The sponsor may decide to include advertisements in the supplement in order to defray costs. Please consult with the HJH&SW advertising representative Michael Roth at 808-595-4124 or email rothcomm@gmail.com for assistance.

7. Supplement issues are posted on the HJH&SW website (<http://www.hawaiijournalhealth.org>) as a full-text PDF (both of the whole supplement as well as each article). An announcement of its availability will be made via a press release and through the HJH&SW email distribution list. Full-text versions of the articles will also be available on PubMed Central.

8. It is the responsibility of the sponsor to manage all editorial, marketing, sales, and distribution functions. If you need assistance, please contact the journal production editor. We may be able to help for an additional fee.

9. The editorial board reserves the right of final review and approval of all supplement contents. The HJH&SW will maintain the copyright of all journal contents.

Sample Workflow and Timeline for a Supplement

1. The sponsor contacts the HJH&SW editors (hjhs@hawaii.edu) to discuss the supplement topic, estimated timeline, length and cost. HJH&SW staff will review the journal requirements for articles and share our review process with the sponsor. **Time frame: 2 weeks**

2. The sponsor will complete the draft contract and pay a non-refundable deposit of \$2500 or half the contract value. **Time frame: 3 days**

3. The sponsor will solicit articles for the supplement. **Time frame: 3-6 months**

Articles must comply with:

- [Instructions for Manuscript Preparation and Submission of Research Articles](#)
- [Instructions for Manuscript Preparation and Submission of Columns](#)
- [HJH&SW Statistical Guidelines](#)
- [HJH&SW Style Guide for Native Hawaiian Words and Phrases](#)
- [AMA Manual of Style](#) A free summary can be found [here](#).

4. The sponsor will oversee the article selection, peer review, and editing process. We recommend that time be allowed for at least two rounds of reviews for each article. **Time frame: 3-6 months**

- Ensure that each article includes Institutional Review Board (IRB) review and approval, and a statement disclosing any conflicts of interest.
- Obtain a [Copyright Transfer Agreement](#) signed by all authors for each article.

5. *Optional:* During this time, the sponsor can solicit advertisements for the supplement to help defray costs for publication and/or printing. To initiate this process, the sponsor will work the HJH&SW advertising representative Michael Roth at 808-595-4124 or roth-comm@gmail.com.

6. The sponsor or their designee will conduct a final review of each article to ensure adherence to HJH&SW guidelines and AMA style. **Time frame: 2 weeks**

7. For each article, the sponsor will submit the final Word document and Copyright Transfer Agreement to the HJH&SW journal production editor. The journal production editor will send the articles to the copy editor for final journal style review. Copyediting will be 8 hours per edition plus 1 hour per article for additional articles purchased. Any additional hours will be billed at \$100 per hour. **Time frame: 2 weeks**

8. The sponsor will submit the final articles to the layout editor for formatting. **Time frame: 1 month**

Acting in the role of guest editor, the sponsor will include a column introducing the supplement.

IMPORTANT: All articles submitted for layout should be in their finalized form. Page proofs will be returned to the sponsor for their review and approval, but changes will only be made to fix any errors that were introduced during the layout process. Any editing or changes to the text or figures after the initial copy layout will incur a fee of \$50 per page.

9. The sponsor will review the electronic copy from the layout editor and submit any final corrections. **Time frame: 5 working days**

10. The layout editor will make the final corrections and provide a finished electronic copy of the supplement to the sponsoring editors to allow time for printing.

11. The managing editor will work with the sponsor to draft a press release. Sponsors should contact the managing editor at least 30 days prior to the date of publication to plan and script the press release. Sponsors are encouraged to submit 1-2 photos to accompany the press release. Note that obtaining signed photo releases is the responsibility of the sponsor.

12. The supplement will be published online along with the press release. An electronic copy will be sent to our subscribers and circulation lists, and the edition will be forwarded to the National Library of Medicine for indexing and made available for no cost access to the public.

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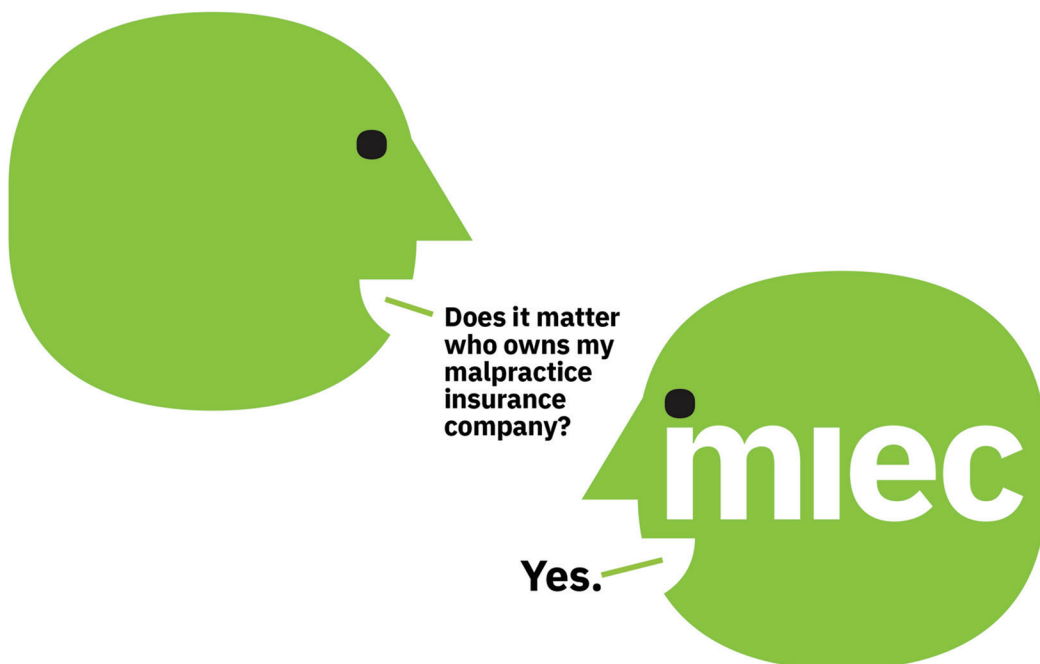
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