

Rate and Distribution of Adverse Reproductive Outcomes for Hawaiians Executive Summary

Kamehameha's strategic plan outlines comprehensive plans to extend educational services to more Hawaiians. One of the precursors leading to special educational needs of Hawaiian youth are cases of adverse reproductive outcomes (ARO) and birth defects.

Findings on all ARO births for the State of Hawai'i during 1986-1999 show that about 5.9 percent (n= 3,824) of all Hawaiian births (n= 65,268) resulted in adverse outcomes, compared to a rate of 5.6 percent across all births.

- Rates by diagnostic cluster for Hawaiians showed the typical predominance of problems in three systems: cardiac and circulatory, limb and musculoskeletal, and genital and urinary. Comparatively low incidence for Hawaiians was observed for chromosomal abnormalities, while exceptionally high incidence was recorded for maternal substance abuse.
- Findings on the maternal substance abuse category of ARO births showed that 54 percent of all reported maternal substance abuse cases involved Hawaiian women (1,062 of 1,925). This contrasts with a 25 percent representation of Hawaiian women across all births.
- Rates for maternal substance abuse per 10,000 live births were about four times the rates of mothers in other major ethnic groups (Caucasian, Filipino, and Japanese mothers) and more than twice as high as the statewide rate.
- Among Hawaiians who reported Maternal Substance abuse, about 4 percent of the total cases involved formal diagnosis of Fetal Alcohol Syndrome, while two-thirds linked to methamphetamine abuse, 30 percent to marijuana, and 22 percent to cocaine (the total exceeding 100 percent due to abuse reported in more than one category).

Implications

Educational intervention and research should focus on

- timely initiation of prenatal care;
- examination of factors shaping substance abuse among Hawaiian women; and
- review of outcomes for babies due to maternal substance abuse.

Rate and Distribution of Adverse Reproductive Outcomes for Hawaiians

As Kamehameha Schools renews its commitment to serving as many Hawaiians as possible, advocates for children with special needs have expressed interest in Kamehameha Schools providing new services to those in need. These children require a range of services, and prevalence data for the State of Hawai'i show that Hawaiian youth are indeed overrepresented among those in the state identified as needing services. This report provides summary data about some of the precursors leading to special needs, specifically as relates to adverse reproductive outcomes and congenital birth defects.

Background

Since 1988, the Hawai'i Birth Defects Program (HBDP) has maintained a population based, active surveillance monitoring system that currently extends across 33 facilities and organizations on all islands. HBDP data are now available for 14 years, 1986-1999 (see Merz and Forrester, 2000). During this period, a total of 14,922, or about 5.3 percent of all births (262,000), were identified as *Adverse Reproductive Outcomes (ARO)*¹. Based on available medical records for each case, about 88 percent (13,188) were classified into the birth defect categories established by the Centers for Disease Control (CDC). The remaining 1,734 cases reflected birth outcomes in three categories of supplementary interest to local health authorities: neoplasms, congenital infections, and maternal substance abuse.

Birth Defects and Births to Hawaiian Women

For the period 1986-1999, a total of 65,268 births to Hawaiian mothers (25% of all births) were reported within the State of Hawai'i². Of these births to Hawaiian women, 3,824 had adverse reproductive outcomes, accounting for about 5.9 percent of all births to Hawaiian women and 26 percent of all Hawai'i birth defect cases. In general, the percent of ARO births for Hawaiian women (5.9 percent of all births) is similar to the percent for the state as a whole (5.6 percent) and the percent for Caucasian (5.5 percent), Filipino (5.3 percent), and Japanese (5.0 percent) women.

¹ Birth defects reporting for State of Hawai'i includes CDC-designated birth defects, plus neoplasms, congenital infections, and maternal substance abuse. HBDP adopts the term "Adverse Reproductive Outcomes" to distinguish within-state reporting as shown here from reporting to CDC.

Source: Merz and Forrester, *Hawai'i Birth Defects Program 1986-1999 Statewide Data, December 2000*. Table 5, pp. 52-60.

² For data reported by maternal ethnic background, the reporting rate within the total pool was about 99 percent (14,762/14,922 cases).

Table 1 provides an overview of birth defect incidence by ethnic group of the mother. Among the four major ethnic groups, Hawaiian women experienced a slightly higher rate of birth defects. However, when all 14 identified groups are considered, seven of the 14 groups listed reported birth defect rates that were higher than the rate for Hawaiian women.

Table 1. Adverse Reproductive Outcomes by Maternal Ethnicity, State of Hawai'i: Cumulative for 1986-1999

	Total Births	% Distribution	ARO Births 1/	% Distribution	Rate per 10,000 births
Caucasian	67,926	25.9%	3,756	25.4%	553.0
Hawaiian	65,268	24.9%	3,824	25.9%	585.9
Filipino	48,285	18.4%	2,545	17.2%	527.1
Japanese	32,644	12.5%	1,627	11.0%	498.4
Chinese	9,941	3.8%	468	3.2%	470.8
Black	8,879	3.4%	551	3.7%	620.6
Samoan	7,324	2.8%	470	3.2%	641.7
Korean	5,504	2.1%	276	1.9%	501.5
Hispanic	3,672	1.4%	304	2.1%	827.9
Portuguese	2,523	1.0%	178	1.2%	705.5
Am. Indian	2,494	1.0%	168	1.1%	673.6
Vietnamese	1,922	0.7%	80	0.5%	416.2
Guamanian	506	0.2%	36	0.2%	711.5
Other	5,090	1.9%	479	3.2%	941.1
Total	261,978	100.0%	14,762	100.0%	563.5

1/ Birth defects reporting for State of Hawai'i; includes CDC-designated birth defects, plus neoplasms, congenital infections, and maternal substance abuse.

Source: Merz and Forrester, *Hawai'i Birth Defects Program 1986-1999 Statewide Data, December 2000. Table 5, pp. 52-60.*

Table 2 shows the rate per 10,000 births of birth defects defined by the *International Classification of Disease, Ninth Revision*, in addition to the information for neoplasms, congenital infection, and maternal substance abuse requested by the State of Hawai'i.

Data are presented for the four major ethnic groups in Hawai'i based on self-identification of the mother (Caucasian, Hawaiian, Filipino, and Japanese). Collectively, these four groups comprised 82 percent of the births during 1986-1999 in the State of Hawai'i (214,123) and 80 percent of the reported birth defects cases (11,752 ARO births). Although rates within diagnostic clusters typically varied by ethnicity, the rate for Hawaiians relative to rates for other groups varied from one cluster to the next.

Creating a ratio of the rate for Hawaiians to the statewide rate shows how Hawaiians as a group fare, compared to the state. This exercise revealed two clusters of outcomes in which the difference exceeded ten percent:

- The incidence of chromosomal abnormalities for Hawaiian mothers tended to be comparatively low, about two thirds of the statewide rate (ratio value: .65); and
- The incidence of confirmed cases of maternal substance abuse was about four times higher for Hawaiian women than for Caucasians, Filipinos, and Japanese mothers and more than twice as high as the statewide rate (ratio value: 2.33).

Table 2. Rate per 10,000 Live Births of Adverse Reproductive Outcomes by Maternal Ethnicity, State of Hawai'i: Cumulative for 1986-1999, Four Major Ethnic Groups and Statewide Total

Diagnosis Cluster 1/	A		B			Hwn/State
	Statewide (282,900 births)	Caucasian (67,926 births)	Hawaiian (65,268 births)	Filipino (48,285 births)	Japanese (32,644 births)	Ratio (B/A)
Brain and Nervous System	40.4	40.3	44.3	43.3	36.1	1.10
Eye, Ear, Face, and Neck	45.0	44.8	48.0	51.4	41.7	1.07
Cardiac and Circulatory	188.4	181.5	198.3	222.0	174.6	1.05
Respiratory	25.1	28.6	25.3	26.7	20.5	1.01
Orofacial and Gastrointestinal	60.5	68.9	58.5	57.8	64.6	0.97
Genital and Urinary	110.5	122.3	117.8	127.8	83.9	1.07
Limb and Musculoskeletal	134.8	163.0	130.2	121.6	127.7	0.97
Skin and Integument	58.6	35.5	63.6	76.2	65.6	1.09
Chromosome and Other Systems	56.7	62.3	36.6	56.3	82.4	0.65
Neoplasms	10.6	9.9	9.8	12.0	13.5	0.92
Congenital Infections	8.1	7.8	7.5	11.2	6.7	0.93
Maternal Substance Abuse	69.7	42.1	162.7	44.3	38.6	2.33
Fetal Alcohol Syndrome	3.0	3.8	5.8	1.0	1.2	1.93
Illicit Drugs	67.9	39.6	159.2	43.5	37.7	2.34
Marijuana	20.9	15.9	49.5	8.9	7.4	2.37
Cocaine	17.3	16.0	36.2	4.6	9.2	2.09
Methamp./Amphe.	37.8	12.1	101.7	32.7	25.4	2.69
Total	528.0	553.0	585.9	527.1	498.4	1.11

1/ Birth defects reporting for State of Hawai'i; includes CDC-designated birth defects, plus neoplasms, congenital infections, and maternal substance abuse.

Source: Merz and Forrester, *Hawai'i Birth Defects Program 1986-1999 Statewide Data, December 2000. Table 5, pp. 52-60.*

Maternal Substance Abuse by Hawaiian Mothers

Of the total of 14,922 ARO cases recorded in the State of Hawai'i during 1986-1999, about 13 percent (1,973) were recorded as indicating Maternal Substance Abuse. These cases were identified by blood screening of all pregnant women who self-reported substance abuse or by positive diagnosis of Fetal Alcohol Syndrome among newborns.

Table 3 shows that Hawaiian women represented a markedly disproportionate number of those births classified within the Maternal Substance Abuse category.

- Of the 1,965 cases of Maternal Substance Abuse reported by HBDP between 1986 and 1999, Hawaiian women accounted for about 54 percent (1,062) of the total.
- Overall, more than one quarter of all ARO cases linked to Hawaiian mothers involved Maternal Substance Abuse (1,062 of 3,824 adverse reproductive outcomes cases = 28 percent). This incidence is more than three times higher than the percent of cases across all non-Hawaiian mothers in the state (903 cases of Maternal substance abuse for non-Hawaiians/10,938 cases of adverse reproductive outcomes for non-Hawaiians = 8.3 percent).

Table 3. Maternal Substance Abuse Listed as an Adverse Reproductive Outcome by Ethnicity of the Mother, State of Hawai'i : Cumulative for 1986-1999

Ethnic Group	Total	% Distribution	Mat. Sub. Abuse	% Distribution	Rate per 10,000 births	Total Adverse Outcomes ^{1/}	Sub. Ab. as % Total Adverse Outcomes
Caucasian	67,926	25.9%	286	14.6%	42.1	3,756	7.6%
Hawaiian	65,268	24.9%	1,062	54.0%	162.7	3,824	27.8%
Filipino	48,285	18.4%	214	10.9%	44.3	2,545	8.4%
Japanese	32,644	12.5%	126	6.4%	38.6	1,627	7.7%
Chinese	9,941	3.8%	20	1.0%	20.1	468	4.3%
Black	8,879	3.4%	25	1.3%	28.2	551	4.5%
Samoan	7,324	2.8%	50	2.5%	68.3	470	10.6%
Korean	5,504	2.1%	30	1.5%	54.5	276	10.9%
Hispanic	3,672	1.4%	52	2.6%	141.6	304	17.1%
Portuguese	2,523	1.0%	28	1.4%	111.0	178	15.7%
Am. Indian	2,494	1.0%	42	2.1%	168.4	168	25.0%
Vietnamese	1,922	0.7%	3	0.2%	15.6	80	3.8%
Guamanian	506	0.2%	5	0.3%	98.8	36	13.9%
Other	5,090	1.9%	22	1.1%	43.2	479	4.6%
Total	261,978	100.0%	1,965	100.0%	75.0	14,762	13.3%

Source: Merz and Forrester, *Hawai'i Birth Defects Program 1986-1999 Statewide Data, December 2000.*

The 1,062 cases listed for Hawaiian women included a small percentage (about four percent, N=38) of diagnosed cases of Fetal Alcohol Syndrome. Beyond that, nearly two thirds of the cases were linked to methamphetamine abuse, 30 percent to marijuana, and about 22 percent to cocaine.³

³ Some women were identified as abusing more than one of the major drugs listed; thus, the total adds up to more than 100 percent.

Further analysis reported by HBDP also reveals several findings (see Merz & Forrester 2000).

- First, maternal substance abuse is related to delayed prenatal care. Twenty percent of all mothers in the state who did not receive prenatal care prior to giving birth reported maternal substance abuse. This was more than 50 times higher than the rate for women who initiated prenatal care during the first trimester of their pregnancies (.34 percent).
- Second, maternal age was also important. The maternal substance abuse rate per 10,000 births (103.3) for mothers under age 19 was from 20 to 60 percent higher than rates for mothers in other reported age groups.

Implications for Kamehameha Schools

The data suggest that about one quarter of the total adverse reproductive outcomes among births to Hawaiian women for 1986-1999 was linked to maternal substance abuse. These 1,062 cases represented more than half of the total number of the maternal substance abuse cases (1,965) recorded for the entire state during 1986-1999. Note that these findings may be affected by differential tendencies to self report substance use during pregnancy and/or differential rates of selection for testing of Hawaiian women by medical personnel.

As Kamehameha considers new ventures in preventive health and perinatal health education, the data reviewed above suggest a need to focus on

- Encouraging women to initiate prenatal care within the first trimester of pregnancy;
- Examining the lifestyle, aspiration, and socioeconomic factors within the Hawaiian population that are related to maternal substance abuse among women.
- Analyzing the potential hazards, both short term and long term, to unborn babies as a result of maternal substance use and abuse during pregnancy.

Of the three directions, a focus on timely prenatal care may be particularly critical. According to a review of research by the Institute of Medicine (1988), prenatal care is a proven, cost effective means for improving pregnancy outcomes, one that is particularly important for women who are at increased medical or social risk, or both. Also, because of the role of prenatal care in reducing the incidence of potentially universal events such as maternal and infant deaths and low birthweight babies, it serves as an effective focal point for community-wide perinatal education and prevention efforts.

References

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