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## A GEOGRAPHIC AND ETHNIC GROUP ANALYSIS OF VITAL INDICATORS FOR MATERNAL AND CHILD HEALTH IN HAWAII 1975-1979

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### INTRODUCTION

Health planners often use vital statistics, but it is rare to find a broad range of vital indicators of maternal and child health examined together. This report attempts to make available in a comprehensive fashion recent vital data reflecting maternal and child health for geographic areas and ethnic groups in Hawaii; it presents numbers of natality events, rates, and rankings of geographic areas and ethnic groups but does not contain tests for statistically significant differences between areas or ethnic groups. The report has been prepared in the hope that the data will be of interest and of use to health professionals, students, and planners.

### VITAL INDICATORS

The current levels of nineteen indicators of maternal and child health related to pregnancy and birth have been calculated for all geographic areas and for seven ethnic groups in Hawaii using data from birth certificates, fetal death certificates, and reports of induced termination of pregnancy compiled for federal fiscal years 1975 through 1979 (October 1, 1974 through September 30, 1979) in accordance with Title V regulations regarding maternal and child health. The definitions of the vital indicators used in this report are provided on page 4. Conventional demographic terms and definitions found in the Population Reference Bureau's Population Handbook are used for such standard indicators as birth rate and abortion ratio. Less conventional indicators, such as late prenatal care rate, are defined in accordance with maternal and child health program objectives. All indicators are defined in terms of events in one year.

### POPULATION ESTIMATES

Annual population estimates were prepared for geographic areas and for ethnic groups based on data from the 1975-1979 volumes of the Data Book: A Statistical Abstract published by the State of Hawaii, Department of Planning and Economic Development. Annual estimates of the female population

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aged 13-17 were calculated as 4.75 percent of the total estimated population of each area and ethnic group; this percentage was calculated using figures on the age and sex distribution of the population of the state provided in Table 10 of the 1975 Data Book. Although the age and sex composition of Hawaii's population varies somewhat by geographic area and ethnicity, the exact composition of each area and of each group for each year in the period is not available; the 4.75 percent estimate was therefore applied uniformly.

Population estimates determined by averaging the annual figures are presented for geographic areas in Table 1 and for ethnic groups in Table 2. Birth and pregnancy rates are calculated per 1,000 population. Other indicators are expressed in relation to the number of live births and are therefore independent of population estimates.

#### GEOGRAPHIC AREAS

Vital events are recorded by census tract. The 167 census tracts in Hawaii were grouped into seventeen areas on the basis of program target areas of the Maternal and Child Health Branch of the State Department of Health. Data are presented for the state as a whole and for the seventeen areas: Maui and Kauai Counties, Hilo and Kona districts of Hawaii County, and thirteen areas in Oahu. The census tracts and neighborhoods included in each area are presented in Table 1.

During the latter part of the five year period the reporting of identifying information including the census tract of residence of women who had abortions became optional in order to achieve a more reliable estimate of the number of abortions in the state. The abortions in 1978 and 1979 for which the census tract was not reported were allocated to geographic areas according to the average proportion of all abortions that women in each area had in 1975 through 1977.

#### ETHNICITY

The ethnic group of the woman recorded on the birth or fetal death certificate or on the report of induced termination of pregnancy was used to determine indicator levels by ethnicity. Data are presented separately for seven ethnic groups in Hawaii whose sum comprises over 90 percent of the total population. In order of their proportion in the state population they are Caucasian, Japanese, Hawaiian-Part Hawaiian, Filipino, Chinese, Korean, and Samoan. Births, fetal deaths, and abortions to women in any other group and to women of unknown ethnicity are included in totals covering all ethnic groups but are not listed as a category; births to such women range from approximately six percent of all births in 1975 to about eight percent in 1979.

Because of certain difficulties involved in estimating the size of the Samoan population on an annual basis, a wide range of estimates is used by various state agencies. The unusually high birth and pregnancy rates shown for Samoan women suggest that an underestimate of the total Samoan population was used in the calculations. When birth and pregnancy rates are recalculated using arbitrary higher population estimates, the Samoan levels fall but the relative ranking of the rates by ethnicity remains the same. Other indicators are unaffected by population estimates. The 1980 census should provide more accurate population figures.

### NATALITY EVENTS, RATES, AND RANKS

Tables 3-8 are summary tables containing average annual numbers of natality events, rates, and ranks by area or ethnicity. Table 3 presents the average annual number of events in each indicator by area; Table 6 presents the number of events by ethnicity. The average rates, which measure the relative levels of vital indicators, are provided for geographic areas in Table 4 and for ethnic groups in Table 7. Table 5 provides the average rank of each geographic area on each vital indicator across the five year span. Table 8 presents the rank of each ethnic group. Because data on neonatal and infant mortality are not yet available for fiscal 1979, all figures for these two indicators are averages for 1975-1978.

### DISCUSSION

The rates presented show considerable variation among areas and ethnic groups; whether such differences are statistically significant remains to be seen. Nonetheless, the data suggest possible target populations for maternal and child health programs. A glance at the figures reveals, for example, a very high proportion of pregnancies being terminated by abortion among women who live in Waikiki; among teenage women in Hawaii Kai, East Honolulu, Kailua, and Makiki-Downtown; and among Korean women, suggesting unwanted pregnancies. As another example, late prenatal care rates among Hawaiian-Part Hawaiian, Samoan, and Filipino women are quite high, suggesting these groups might benefit from more concerted outreach work. Target populations within geographic areas may be further identified when 1980 census data matching geographic area and ethnicity become available.

As stated in the introduction, the purpose of this publication is to make basic data available for general use. In addition to identifying target groups and districts in need of services, the data may be used to evaluate the effectiveness of services which are expected to impact on specific health indices such as incidence of teenage pregnancy or neonatal mortality. The data may also lead to more realistic planning by forcing planners to consider whether the services provided to obtain certain objectives are truly capable of doing so. For example, health services alone may not be capable of reducing incidence of low birth weight in certain geographic areas. If health services are needed, it may be necessary to define more realistic objectives in order to specify those needs.

Finally, it is of interest to note that the data as displayed represent a continuum of measures related to all phases of the reproductive cycle. Intuitively one feels that characteristic events of one phase of the life cycle must bear a relationship to the occurrence of characteristic events in another phase. A woman's experience in family planning or in education for family life will relate to her experience during pregnancy and to its eventual outcome. The nature of these relationships can be a subject for future research.

### REFERENCES

- Haupt, Arthur and Thomas T. Kane  
1980 Population Handbook International Edition, Washington, D.C.:  
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1975-1979 The State of Hawaii Data Book: A Statistical Abstract,  
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## DEFINITIONS OF VITAL INDICATORS

INDICATOR	DEFINITION
Standard Fetal Death Ratio	The number of fetal deaths per 1000 live births in a given year.
Abortion Ratio	The number of elective abortions per 1000 live births in a given year.
Birth Rate	The number of live births per 1000 population in a given year.
Pregnancy Rate	The total number of live births, elective abortions, and standard fetal deaths per 1000 population in a given year.
Illegitimacy Ratio	The number of births to unmarried women per 1000 live births.
Abortion Ratio for Unmarried Women	The number of abortions to unmarried women per 1000 live births.
Teenage Abortion Ratio	The number of abortions to females 13-17 years of age per 1000 live births to females 13-17 years of age.
Teenage Birth Rate	The number of births to females 13-17 years of age per 1000 13-17 year old females.
Teenage Pregnancy Rate	The total number of live births, elective abortions, and standard fetal deaths to females 13-17 years of age per 1000 13-17 year old females.
Large Family Rate	The number of births to mothers with three or more live born children per 1000 live births.
Late Prenatal Care Rate	The number of births to mothers getting prenatal care after the first trimester of pregnancy per 1000 live births.
Rate of Births with No Prenatal Care	The number of births to mothers getting no prenatal care per 1000 live births.
Low Birth Weight Rate Among Single Live Births	The percentage of low birth weight babies (babies born weighing 2500 grams, 5 pounds 8 ounces, or less) among single live births. (In Tables 3-8 Low Birth Weight is abbreviated LBW; Single Live Births is abbreviated SLB.)
Teenage Low Birth Weight Rate Among Single Live Births	The percentage of low birth weight babies (babies born weighing 2500 grams, 5 pounds 8 ounces, or less) among single live births to females 13-17 years old.
Postmature Birth Rate	The number of postmature births (babies born at more than 42 weeks of gestation) per 1000 live births.
Non-Hospital Delivery Rate	The number of babies delivered outside a hospital per 1000 live births.
Congenital Anomaly Rate	The number of babies born with congenital malformations per 1000 live births.
Neonatal Mortality Rate	The number of deaths to infants under 28 days of age in a given year per 1000 live births in that year.
Infant Mortality Rate	The number of deaths to infants under one year of age in a given year per 1000 live births in that year.

NOTE: All indicators are defined in terms of events in one year. The tables present five year averages.

TABLE 1  
CENSUS TRACTS, NEIGHBORHOODS, AND FIVE YEAR AVERAGE ESTIMATE OF THE TOTAL  
POPULATION AND OF THE FEMALE POPULATION AGED 13-17 FOR EACH AREA OF HAWAII  
FISCAL 1975-1979

AREA	CENSUS TRACTS	NEIGHBORHOODS	FIVE YEAR AVERAGE ESTIMATE OF TOTAL POPULATION	FIVE YEAR AVERAGE ESTIMATE OF FEMALE POPULATION AGED 13-17
State of Hawaii			895,629	42,542
Hawaii Kai	001	Hawaii Kai	22,082	1,049
Palolo	010-012	Palolo	15,047	715
Waikiki	018-020	Waikiki	18,230	866
East Honolulu	002-009,013-017, 021-031	Kuliouou, Waialae-Kahala, Kaimuki, Diamond Head, St. Louis, Kapahulu, Manoa, McCully, Moiliili	121,649	5,778
Makiki-Downtown	032-052	Makiki, Kakaako, Downtown, Punchbowl, Nuuanu	83,588	3,970
Kalihi-Palama	053-066	Palama, Kalihi Kai, Kuhio Park Terrace, Kalihi Valley	60,928	2,894
Aliamanu-Aiea-Pearl Ridge	067-068,075-080	Aliamanu-Moanalua, Stadium, Foster Village, Pearl Ridge-Aiea, Manana-Waimano	86,093	4,089
Wahiawa-Whitmore	091-094	Whitmore, Wahiawa	20,817	989
Military Housing	069-074,081-083, 085,090,095,108	Navy Housing, Hickam, Pearl Harbor, Iroquois Point, Barbers Point, Wheeler, Schofield, Mokapu	86,895	4,127
Waianae Coast	096-098	Nanakuli-Maili, Waianae, Makaha	28,184	1,339
Rural Oahu	084,086-089, 099-107	Waipahu-Ewa, Mililani, Haleiwa-Waialua, Koolauloa, Koolauloko	127,358	6,050
Kailua	109-112	Kailua	41,740	1,983
Waimanalo	113	Waimanalo	8,636	410
Kauai County	401-413	Kauai County	34,140	1,622
Maui County	301-319	Maui County	59,580	2,830
Hilo District	210-211	South Hilo, Puna	49,606	2,356
Kona District	212-222	Kau, South Kona, North Kona, South Kohala, North Kohala, Hamakua, North Hilo	31,056	1,475

Note: The population estimates for the State of Hawaii were calculated by adding the five year average estimates of all areas. The annual estimates of the female populations aged 13-17 were calculated as 4.75 percent of the annual total population estimates.

TABLE 2  
FIVE YEAR AVERAGE ESTIMATE OF THE TOTAL POPULATION AND OF  
THE FEMALE POPULATION AGED 13-17 FOR SEVEN ETHNIC GROUPS  
IN HAWAII  
FISCAL 1975-1979

ETHNICITY	FIVE YEAR AVERAGE ESTIMATE OF TOTAL POPULATION	FIVE YEAR AVERAGE ESTIMATE OF FEMALE POPULATION AGED 13-17
Caucasian	240,590	11,428
Japanese	231,428	10,993
Hawaiian-Part Hawaiian	169,027	8,029
Filipino	88,541	4,206
Chinese	37,825	1,797
Korean	10,237	486
Samoaan	6,512	309

Note: The annual estimates of the female populations aged 13-17 were calculated as 4.75 percent of the annual total population estimates.

TABLE 6  
 AVERAGE ANNUAL NUMBER OF EVENTS IN 19 VITAL INDICATORS OF MATERNAL AND CHILD HEALTH  
 BY ETHNICITY OF WOMAN: HAWAII  
 FISCAL 1975-1979  
 NUMBER OF EVENTS

1975-1978  
 AVERAGE

Ethnicity of Woman	NUMBER OF EVENTS														1975-1978 AVERAGE				
	Standard Fetal Deaths	Elective Abortions	Live Births	Pregnancies	Births to Unmarried Women	Abortions to Unmarried Women	Teenage Abortions	Teenage Live Births	Teenage Pregnancies	Births to 3 or More Live Mothers with Born Children	Births with Late Prenatal Care	Births with No Prenatal Care	Number of LBM Single Live Births Among LBM Babies Born to Teenagers to SLB to Teens	Postmature Births	Non-Hospital Deliveries	Congenital Anomalies	Neonatal Deaths	Infant Deaths	
All Ethnic Groups	1587.6	5283.8	16536.2	23407.6	2327.4	3405.6	432.4	644.2	1137.0	1760.2	4401.6	201.6	1089.2	1867.8	164.8	153.2	145.3	207.8	
Caucasian	586.8	1715.4	5266.8	7569.0	512.2	1212.4	132.4	131.4	281.4	358.6	1292.4	50.6	266.8	605.2	114.2	46.8	38.8	55.3	
Japanese	185.2	925.0	2386.2	3496.4	135.0	617.4	77.6	43.4	124.4	103.8	324.6	23.2	167.6	241.0	6.4	17.4	17.5	25.3	
Hawaiian-Part Hawaiian	264.8	764.4	3532.2	4561.4	1004.2	545.2	109.0	277.4	409.6	627.0	1170.8	56.4	252.8	469.0	19.4	37.4	32.3	46.0	
Filipino	232.6	698.4	2866.4	3797.4	338.8	340.2	63.4	117.0	189.4	342.2	845.2	28.8	282.2	258.0	8.8	29.0	27.3	34.5	
Chinese	45.2	211.4	611.4	868.0	27.8	118.6	11.6	6.2	18.2	40.6	87.6	3.8	33.2	65.4	3.4	5.4	2.8	4.0	
Korean	36.8	262.8	301.8	601.4	16.0	122.4	5.2	4.0	9.2	13.4	79.8	3.4	17.6	34.0	1.0	3.2	2.8	3.3	
Samoa	27.2	94.0	434.8	556.0	99.6	62.4	6.0	18.8	25.6	130.8	232.4	17.8	13.0	59.6	2.0	4.2	4.0	4.5	
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1975-1978  
AVERAGE

TABLE 7  
AVERAGE ANNUAL RATES OF 19 VITAL INDICATORS OF MATERNAL AND CHILD HEALTH  
BY ETHNICITY OF WOMAN: HAWAII  
FISCAL 1975-1979

Ethnicity of Woman	Standard Fetal Death Ratios	Abortion Ratios	Birth Rates	Pregnancy Rates	Illegitimacy Ratios	Abortion Ratios for Unmarried Women	Teenage Abortion Ratios	Teenage Birth Rates	Teenage Pregnancy Rates	Large Family Rates	Late Prenatal Care Rates	Rates of Birth with No Prenatal Care	LBM Rates Among Single Live Births	Teenage LBM Rates Among SLB to Teens	Postmature Birth Rates	Non-Hospital Delivery Rates	Congenital Anomaly Rates	Neonatal Mortality Rates	Infant Mortality Rates
All Ethnic Groups	96.0	319.5	18.5	26.1	140.7	205.9	671.2	15.1	26.7	106.4	266.2	12.2	6.7	10.9	113.0	10.0	9.3	8.8	12.6
Caucasian	111.4	325.7	21.9	31.5	97.3	230.2	1007.6	11.5	24.6	68.1	245.4	9.6	5.2	6.9	114.9	21.7	8.9	7.4	10.5
Japanese	77.6	387.6	10.3	15.1	56.6	258.7	1788.0	3.9	11.3	43.5	136.0	9.7	7.1	10.6	101.0	2.7	7.3	7.3	10.6
Hawaiian - Part Hawaiian	75.0	216.4	20.9	27.0	284.3	154.4	392.9	34.5	51.0	177.5	331.5	16.0	7.3	10.8	132.8	5.5	10.6	9.1	13.0
Filipino	81.1	243.7	32.4	42.9	118.2	113.7	541.9	27.8	45.0	119.4	294.9	10.0	9.1	15.5	90.0	3.1	10.1	9.5	12.0
Chinese	73.9	345.8	16.2	22.9	45.5	194.0	1871.0	3.5	10.1	66.4	143.3	6.2	5.5	12.9	107.0	5.6	8.8	4.6	6.5
Korean	121.9	870.8	29.5	58.7	53.0	405.6	1300.0	8.2	18.9	44.4	264.4	11.3	5.9	10.0	112.7	3.3	10.6	9.3	10.9
Samoaan	62.6	216.2	66.8	85.4	229.1	143.5	319.1	60.8	82.8	300.8	534.5	40.9	3.0	2.3	137.1	4.6	9.7	9.2	10.3

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TABLE 8  
AVERAGE RANK OF 7 ETHNIC GROUPS OF HAWAII ACCORDING TO 19 VITAL INDICATORS  
OF MATERNAL AND CHILD HEALTH  
FISCAL 1975-1979  
RANKING (HIGH TO LOW)

1975-1978  
AVERAGE

Ethnicity of Woman	1975-1978 AVERAGE																		
	Standard Fetal Death Ratios	Abortion Ratios	Birth Rates	Pregnancy Rates	Illegitimacy Ratios	Abortion Ratios for Unmarried Women	Teenage Abortion Ratios	Teenage Birth Rates	Teenage Pregnancy Rates	Large Family Rates	Late Prenatal Care Rates	Rates of Birth with No Prenatal Care	LBM Rates Among Single Live Births	Teenage LBM Rates Among SLB to Teens	Postmature Birth Rates	Non-Hospital Delivery Rates	Congenital Anomaly Rates	Neonatal Mortality Rates	Infant Mortality Rates
Caucasian	2	4	4	4	4	3	4	4	4	4	5	6	6	6	3	1	5	5	5
Japanese	4	2	7	7	5	2	2	6	6	7	7	5	3	4	6	7	7	6	4
Hawaiian - Part Hawaiian	5	6	5	5	1	5	6	2	2	2	2	2	2	3	2	3	1.5	4	1
Filipino	3	5	2	3	3	7	5	3	3	3	3	4	1	1	7	6	3	1	2
Chinese	6	3	6	6	7	4	1	7	7	5	6	7	5	2	5	2	6	7	7
Korean	1	1	3	2	6	1	3	5	5	6	4	3	4	5	4	5	1.5	2	3
Samoan	7	7	1	1	2	6	7	1	1	1	1	1	7	7	1	4	4	3	6